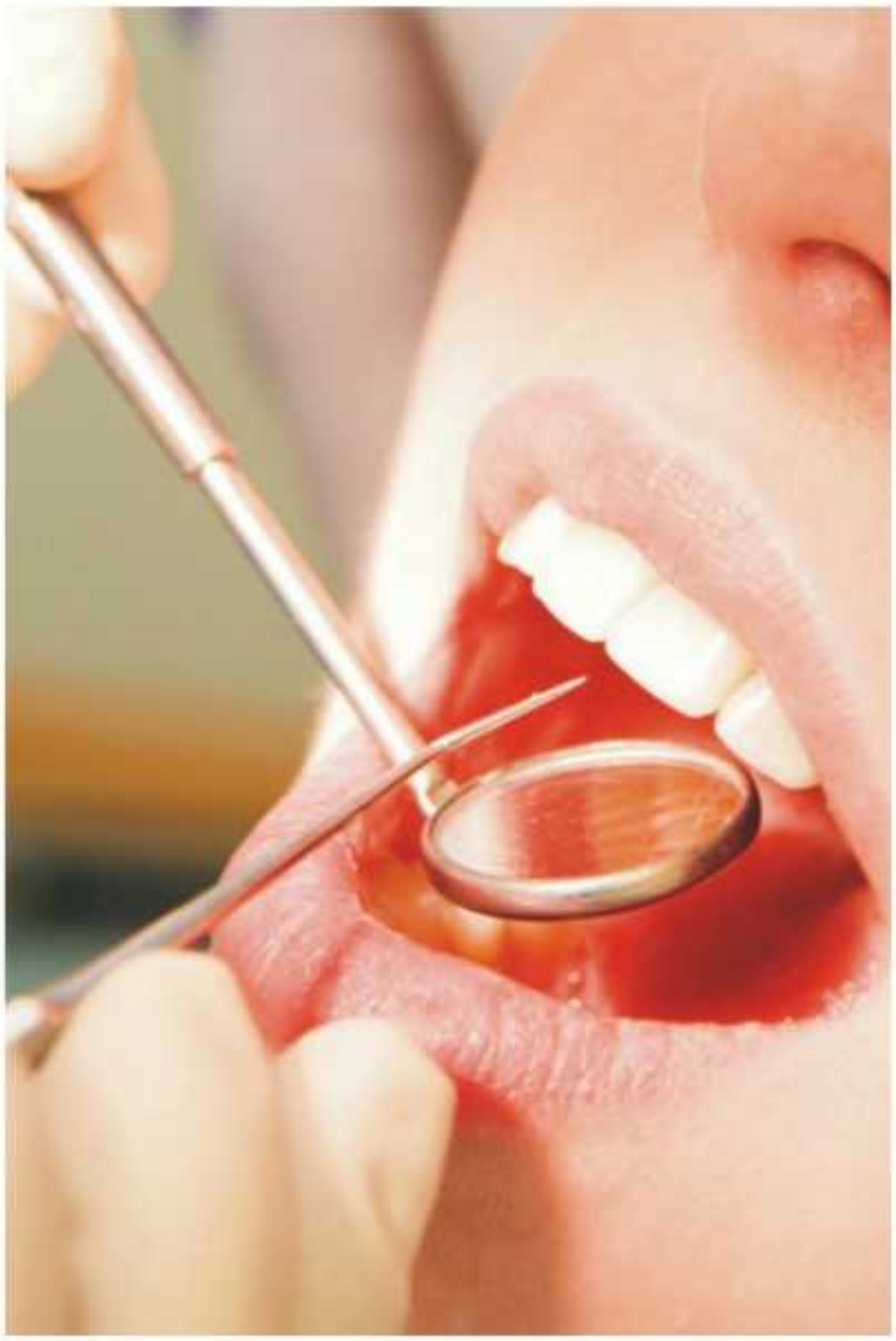

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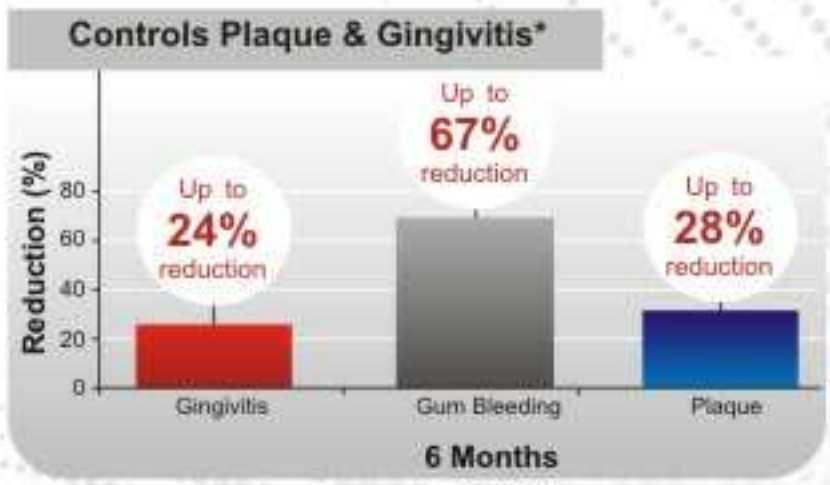

* Vs a control mouth rinse, Donald R Allen et al. Compend, 19: 20-26, 1998.

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"Publish or Perish" is the slogan given by the council which is showing results and the dental faculty of various colleges in the country is now working hard towards getting their work published in various journals .I thank god for having given me the strength and courage to edit this journal with whatever little acumen I have gained during these years of my teaching career

My sincere advice to my fellow colleagues is to work conscientiously towards getting their articles published not just for the sake of it but for letting the people know worldwide what we are worth and what we are doing and also to improve our integrity as professionals and teachers .India is progressing towards becoming a developed nation and this is the reason that the superpowers are also getting attracted towards this great country.

Let us all put our head together and do something worthwhile to let the coming generations feel proud of what we have done and to let them take the torch of glory to further heights.

Dr Vikas Jindal
Editor-in-Chief

ACKNOWLEDGMENT

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Original Article

FRACTURE RESISTANCE OF ENDODONTICALLY TREATED PREMOLARS BY VARIOUS RESTORATIVE MATERIALS- AN INVITRO STUDY

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Abstract

The aim of this study was to evaluate the fracture resistance of endodontically treated premolars by various restorative materials. Forty-two extracted human, caries free, maxillary premolars were enlarged to size # 50. Mesiodistocclusal cavity preparations were done and restored using three restorative materials (one Ormocer, one ClearfilTM AP-X composite, and one high copper Amalgam) and two application techniques (with or without coronal radicular technique). The samples were placed into the resin up to the level of the CEJ. The teeth were mounted in an Universal Testing Machine at 150 – degree angle and the force of fracture of the buccal walls of each tooth was recorded. Tukey's test showed that when the coronal radicular restoration technique was used, Ormocer material showed better fracture strength than ClearfilTM AP-X composite material and Amalgam. Coronal radicular restoration technique and tooth – etch bonding system provides better fracture resistance of endodontically treated teeth with MOD cavities.

Key words

Amalgam; Composite Resin; Bonding System; Coronal Radicular Technique; Fracture Resistance.

INTRODUCTION

The search for an ideal and universally acceptable system to restore pulpless teeth is still a goal of dental materials research.

Compared to teeth with healthy pulp, root filled teeth are considered more susceptible to fracture as they possess reduced dentinal elasticity, lower water content, deeper cavities and substantial loss of dentin.1. Controversy exists as to whether endodontic procedure are the primary cause for the loss of strength for a tooth. It was concluded that endodontic procedures had only a small effect on tooth strength. Rather, it was the advancing preparation that caused reduction in relative stiffness of tooth.2

The ability to predictably restore an endodontically treated tooth to its original strength and the fracture resistance without placement of a full coverage restoration could

provide potential periodontal and economic benefits to patients. Several researchers have reported that bonded composite restorations will better strengthen a tooth compared with Amalgam. As a result of recent developments in composite resin technology, new restorative materials with improved mechanical and physical properties such as hybrid and packable composites have been introduced in the market.4

The new class of resin composites, high viscosity, packable composites whose handling has been modified to mimic the condensability of the amalgam. Ormocers, organically modified ceramics having filler size 0.8 ? m and 82% by weight that consist of organic – inorganic copolymer and inorganic silanated filler particles. This material is stiffer, having increased strength due to ceramic fillers and less sticky than traditional composites.5 Hybrid composite ClearfilTM AP-X used in this study is fluoride free composite, consists of barium glass fillers of 85 wt%. ClearfilTM SE bond is a fluoride free two step self etching primer adhesive system.6

In the present study, new coronal radicular technique is used a long with recently introduced packable composite i.e. Ormocer, to evaluate the fracture strength. In coronal radicular technique 2mm of the canal filling material is removed from the canal orifice and replaced with restorative material.4 Few studies have been conducted using this technique to check its efficacy.

This in vitro study is another effort to check the fracture resistance of endodontically treated maxillary premolar teeth with or without coronal radicular technique, and comparison among fracture resistance of various restorative groups and application techniques.

METHODS AND MATERIALS

Forty two freshly extracted human maxillary first premolars of nearly equal dimension were used in this study.. The samples were cleaned free of debris and calculus and were stored in humidity at room temperature. All the teeth were mounted in self cure acrylic resin to the level 2mm below the CEJ and the cusp tips alined in the same plane to ensure a more equal distribution of load during testing.

The teeth were randomly divided into six groups of teeth.

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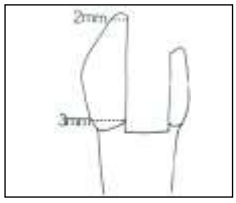
Table 1 : 42 teeth divided into 6 groups

Sl. No.	Groups	No. of teeth
1.	Class II MOD cavities filled with high copper amalgam	7
2.	Class II MOD cavities were restored with CR restoration of amalgam	7
3.	Class II MOD cavities acid etched; bonding agent applied, restored with ormocer composite	7
4.	Class II MOD cavities were restored with CR restoration of ormocer composite	7
5.	Class II MOD cavities were not acid etched separately and self etching adhesive applied and restored with clearfilTM AP-X composite	7
6.	Class II MOD Cavities were restored with CR restoration of clearfilTM AP-X composite	7

TOOTH PREPARATION:

The cavity preparation and the method of restoration was standardized for all groups. Forty-two extracted human maxillary first premolars without caries were used in this study. Access cavities were prepared, two canals located, buccal and palatal. The root canals were enlarged to the apical foramen with K-files to size 50. A standard flare was done by the insertion of # 2 to # 5 gates glidden drills. Irrigation during cleaning and shaping was performed using a 2.5% NaOCl solution. After instrumentation all teeth were obturated with gutta percha and zinc oxide engenol sealer, by lateral condensation technique.

Then the teeth were randomly divided into six groups of 7 each. MOD cavities were prepared in each tooth down to the canal orifices making the buccal cusp of 2mm width at the occlusal surface and 3mm at the CEJ. (figure 1)



In 21 specimens, 2 mm of the canal filling material was removed from the canal orifice with the help of gates glidden drill and replaced with restorative material. This technique is called coronal radicular restoration.

The teeth were restored in the following manner :

Group I: Tofflemire retainer and matrix band applied around the cavities and it is restored with high copper amalgam (DPI alloy), carved and polished after 24 hours.

Group II : In this 2mm of canal filling material was removed with gates glidden drill and after application of tofflemire retainer and band, amalgam was condenced, carved and polished after 24 hours. Teeth were restored with coronal radicular restoration of amalgam.

Group III : Cavities were acid etched with 37% of phosphoric acid for 15 seconds rinsed for 10 seconds and dried gently. A one layer of single bond (Admira, Voco) was then applied, and cured for 20 seconds with light curing unit having intensity of 450 mW/cm2. A steel matrix was applied with a tofflemire retainer. Ormocer composite was incrementally placed and cured. Each increment was cured for 40 seconds. The cavities were then contoured, finished (super snap kit) and polished with composite polishing kit.

Group IV : 2mm of canal filling material was removed with the help of gates glidden drill and cavities were restored with coronal radicular restoration of ormocer as described earlier.

Group V : Self etching primer coat was applied to the cavity walls, gently blew with the air and dried for 15 seconds. Single coat of adhesive was applied and light cured for 20 seconds with a light curing unit (Confident, India) having light intensity 450mW/cm2 (radiometer). A steel matrix was applied with a tofflemire retainer. The cavities were restored with ClearfilTM AP-X composite incrementally. Each 2mm increment was cured for 40 seconds. The cavities were then contoured, finished and polished with super snap kit and composite polishing kit (Shofu Japan).

Group VI : 2mm of canal filling material was removed with gates gildden drill and cavities were restored with coronal radicular restoration of ClearfilTM AP-X composite as described earlier.

TESTING

The restored teeth were stored in an incubator at 370 C in 100% humidity for 48 hours. Stainless steel custom made jig was made of angulations 150 degree. The teeth were tested with Instron Universal testing machine. Jig was fitted on the testing machine and samples were mounted in the polymethylmethacrylate. Directly the mounted samples one by one placed on the angulated platform of the jig and the buccal walls of the premolars were then subjected to slowly increasing force (1mm/min) at the junction of the buccal cusp and the filling material. The force was applied at a 150 degree angle to the long axis of the teeth. (figure2) The data were analyzed using a one way analysis of variance and Tukey test.

RESULTS

The aim of the present study was to check the fracture resistance of endodontically treated premolars by various restorative materials.

Intragroup comparison – Unpaired t test

Intergroup comparison – One way ANOVA followed by Tukey's hoc test pair wise comparison.

Force required to fracture individual endodontically treated tooth in each group, mean of each group and standard deviation are presented in following tables.

Table 2 : Load required to fracture teeth of different groups :

Restorative Materials	Groups	Fracture strength (Kg)			
		Min	Max	Mean	SD
Amalgam	gp I C CR	10.2	19.3	14.5	2.9
	gp II WCR	14.1	30.1	21.8	6.3
Ormocer	gp III C CR	25.1	45.6	32.6	7.6
	gp IV WCR	30.2	54.2	42.1	10.1
ClearfilTM AP-X	gp V C CR	21.1	35.1	27.6	4.7
	gp VI WCR	27.5	42.1	34.5	5.9

Graph 1. Means and standard deviation of different groups

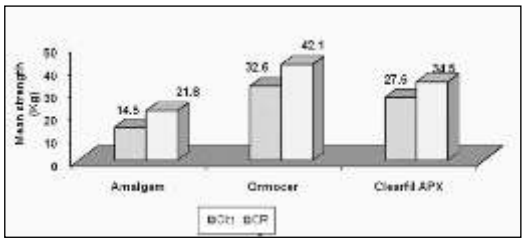


Table 3 : Comparison of load required to fracture between various restorative materials and application techniques.

Restorative Materials	WCR		CR		Difference (WCR Vs CR)	
	Mean	SD	Mean	SD	Mean diff	P-Value
Amalgam	14.5	2.9	21.8	6.3	7.3	<.05, S
Ormocer	38.6	7.6	42.1	10.1	9.5	0.07,NS
ClearfilTM AP-X	27.6	4.7	34.5	5.9	6.9	<.05, S

ANOVA Tukey's interval		F = 20.9P < .05, S 10.4	F = 12.6 P<.05, S 14.8
Difference	Amalgam – Ormocer	P<.05, S	P<.05, S
Between	Amalgam – ClearfilTM AP-X	P<.05, S	NS
Restorative materials	Ormocer – ClearfilTM AP-X	NS	NS

One-way analysis of variance indicated a significant difference among the mean of groups. Tukey multiple comparison test revealed statistically significant differences among the mean of different groups. No statistically significant differences were found among the two application techniques for Ormocer. However, statistically significant differences were noted among the two application techniques for Amalgam and ClearfilTMAP-X.

Under the conditions of the present study, the tooth coloured restorative materials enhanced the fracture resistance of endodontically treated teeth, when coronal radicular application technique was used.

DISCUSSION

With inception of new materials, operative dentistry has undergone sea change. In addition to preservation of tooth, restoring the tooth strength to physiologic level has been the unequivocal goal. Composite resin bind micromechanically to tooth structure by forming resin tags and thus reinforce the tooth.22

It was concluded in the experiment that the width of the occlusal portion of preparation affects the strength of the crown of a prepared tooth. The extension of a preparation to involve proximal boxes does not significantly reduce the strength of a tooth provided only a minimal amount of dentin is removed.24 Preparation of mesioocclusodistal cavity where in two marginal ridges are crossed results in 35% decrease in fracture resistance of vital tooth.25

One of the most important controversial topics is how to reinforce the endodontically treated posterior teeth after mesiooclusodistal cavity preparation. It was found that endodontic treatment resulted in only a 5% reduction in the relative stiffness of a tooth, while on additional MOD preparation increased its value to 63%.9

More recently emphasis has been placed on intra coronal strengthening of teeth to protect them against fracture.14Today many different types of techniques and materials are available to better reinforce the endodontically treated tooth.

With the recent advancements in adhesive technology with stronger composite materials, it is possible to create highly aesthetic restorations that are bound directly to teeth. The resin forced into these tubules holds the tooth together, increasing its resistance to fracture.30 Study have shown that there is increase in the structure resistance of teeth, when MOD preparations were acid-etched before restoration with a composite resin.1

Admira, an Ormocer organically modified ceramic, packable composite used in this study consists of 3- dimensionally curing co-polymers of inorganic and organic elements, similar to tooth substance. It also contains an inorganic backbone of silicon dioxide and dimethacrylate as a resin base have filler size of 0.8? m and 82% by weight. Hybrid composite clearfilTM AP-X used in this study is fluoride free composite. ClearfilTM SE bond is a fluoride free two step self etching primer adhesive system. Composite consists of barium glass fillers of 85 wt%. An acidic monomer, 10-methacryloxydecyl dihydrogen phosphate (MDP), is present in the primer, which demineralizes the smear layer and underlying dentin, resulting in mild surface etching.6

The advantage of two step self etching adhesive system is that, it is a time saving procedure and there is no over wet and dryness of dentin after rinsing and drying because separate acid etching step is omitted.30

In the present study, new coronal radicular technique was used along with recently introduced packable composite i.e. Ormocer, to evaluate the fracture strength. Very few studies have been conducted using this technique to check the efficacy of this. Hence the aim of present study was to evaluate and compare the fracture resistance of endodontically treated teeth with two application techniques, with or without CR extension.

The difference between the height of the two cusps is more pronounced in the upper first than in the second premolar, and the occlusal slope of the facial cusp of the upper first premolar is more susceptible to fracture than the lingual cusp.33 Hence the fracture resistance was checked on maxillary first premolars and load was applied on the interface of buccal wall and restorative material.

The results showed that the specimens restored with coronal radicular restoration of Ormocer had better fracture resistance. Group (IV, VI) which were restored with coronal radicular extension of composites showed better fracture resistance than groups III and V restored with composite resin without coronal radicular extension. And the groups I

and II which were restored with and without coronal radicular extension of amalgam showed less fracture resistance than rest of the groups.

These results suggest that teeth that are etched, bonded and restored with resin composite, the cusps are mechanically splinted together. The reaction of these teeth to a load is similar to the reaction of unprepared teeth. The cuspal reinforcing effect of bonded resin composite restorations has generally been accepted.34

Force required for groups. Group IV where Ormocer was used with coronal radicular technique showed maximum 42.1Kg of fracture strength i.e. highest among all the groups due to separate etching step and extension of bulk of restorative material into the root canal space, offers the additional resistance form to the pulp chamber.13

Group VI which was restored with ClearfilTM AP-X hybrid composite with coronal radicular technique showed less fracture strength that is 34.5 kg than group IV. ClearfilTM AP-X composite showed less fracture resistant values than Ormocer. The self-etching primers (SEPs) in this include a phosphonated resin molecule that performs two functions simultaneously, etching and priming of dentin and enamel. Unlike conventional etchants, self etching primers are not rinsed off, and when the surface was observed under scanning electron microscopy, shallower etching pattern was seen than when a conventional acid etchant was used.30 It consists of barium glass fillers which has a degradation rate higher in saliva simulating solutions. From a clinical viewpoint, using silica filled composite has been recommended instead of a glass – filled composite that leaches more filler elements and degrades faster.36 As the comparison was done by statistical analysis between Ormocer and ClearfilTM AP-X, P value was more than 0.05, which is not significant.

Group III that was restored without CR extension of Ormocer showed 32.6 kg fracture strength as compared to group V, which showed fracture strength of 27.4 kg and was restored without CR extension of Clearfil TM AP-X. Due to total etch system and presence of high filler loading, Ormocer showed better fracture resistance than ClearfilTM AP-X. Statistically when both the techniques with or without CR extension was compared for Ormocer, P value showed non-significant result. But for Clearfil TM AP-X, P values were less than 0.05, which is significant.

Group II restored with CR extension of Amalgam showed 21.8 kg fracture strength than Group I, which was restored without CR extension of Amalgam showed least fracture strength that is 14.1 kg. Statistically the P value for Amalgam with and without CR extension was less than 0.05, which is significant. In this study Amalgam restored teeth found to be less fracture resistant than packable composite and hybrid composite. This result is not surprising because traditional Amalgam restorations do not provide a tooth strengthening effect, but only bulk replacement of lost tooth tissue. On the contrary, they may act as wedge between the buccal and lingual cusps and therefore increase the risk of cuspal fracture. Condensation of Amalgam leads to cuspal deflection and this creates a strain in restoration on tooth complex thus reducing the fracture resistance of tooth.4

When restoring with composite many factors may affect the resistance of a tooth to vertical and/or cuspal fracture, such as cavity dimension or restorative system utilized. High visocity bonding agents may also provide a layer of substantial thickness that acts as a stress absorber.34

Strengthening effect on the teeth by the restorative materials is influenced by bond between restoration and tooth structure and modulus of elasticity of the restorative material.22,34

Composites have a lower modulus of elasticity (16.6 GPa) compared to Amalgam (27.6 GPa); therefore, more loads is absorbed in the composite resin than the Amalgam. Composite, therefore, may transmit less of the applied load to the underlying tooth structure.37

The continually increasing load applied to teeth in this study is not typical of the type of loading that occurs clinically. Except for a single traumatic incidence, teeth that crack or fracture in the mouth usually do as result of repeated episodes of stress that fatigue the crystalline structure and produce microcracks that propogate until failure of the structure occurs. Long term clinical trials are needed to assess these factors and to determine the longevity of different restorations and their usefulness in reducing the incidence of tooth fracture.

CONCLUSION

Following conclusions can be drawn from this study:

- Packable composite, Hybrid composite do strengthen the endodontically treated tooth better than Amalgam, because the cusps are mechanically splinted together.
- Coronal radicular technique gives better resistance to the material as compared to without coronal radicular technique, as it increases the bulk of material in the root canal.
- Bonding ability of restorative systems to cavity walls is more effective when the preparations are separate acid etched before restoration.

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Original Article

"A COMPARATIVE STUDY OF DEGREE OF CONVERSION (DOC) OF HYBRID COMPOSITE RESINS WITH NANOCOMPOSITE RESINS WHEN EXPOSED TO VISIBLE LIGHT CURE (VLC) UNIT AND LIGHT EMITTING DIODES (LED): AN IN-VITRO STUDY."

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Abstract

BACKGROUND: Recent advances in resin adhesives and restorative materials, as well as an increased demand for esthetics, have lead to the introduction of newer resin-based composites like nanocomposites and light curing units like Light Emitting Diodes.

AIM: The present study was conducted to evaluate the effect of conventional Quartz Tungsten Halogen (QTH) curing unit and Blue Light Emitting Diode (LED) on degree of conversion of hybrid composite (Filtek Z250, 3M ESPE) and nanocomposite (Filtek Z350, 3M ESPE) resins.

METHOD: Forty brass molds measuring 6±0.2 mm in length and 4mm in diameter were used. The molds were divided into 4 groups of 10 each and were prepared according to restorative resin and light cure unit used- Hybrid/QTH, Nanocomposites/QTH, Hybrid/LED and Nanocomposites /LED. Degree of Conversion was measured by using Scraping method. The results were analyzed using 'One way-ANOVA and Independent t-tests'.

Results: Maximum degree of conversion was obtained for the Hybrid composites exposed both to LED and QTH. LEDs were found to cause greater degree of conversion than QTH in both the composites.

Key words

Nanocomposites, Hybrid Composites, Quartz Tungsten Halogen (QTH), Light emitting Diode (LED), Degree of Conversion, Depth of Cure.

INTRODUCTION

Recent advances in resin adhesives and restorative materials, as well as an increased demand for esthetics, have stimulated a great increase in the use of resin-based composites. Central to the placement of direct tooth-colored resin restorations is the need for adequate resin polymerization. However, despite the remarkable developments in the technology of the restorative resins, clinical failures of resin restorations are still reported due to polymerization shrinkage and low Depth of Cure of restorative materials which in turn causes degradation, substance loss, bulk fracture, discoloration with marginal staining of restoration. This addresses the need to characterize properties like: (a.) polymeric component - to minimize the deleterious effects of contraction stresses developed during polymerization and (b.) candidate light curing unit- to improve the degree of conversion of restorative resin.1

For this reason, several new materials have been developed with modifications in filler technology, filler distribution, filler loading and alterations in the matrices2 like micro-hybrids, packable composites and more recently, nanocomposites that have been added to the vocabulary of restorative dentistry. The nanocomposites consist of two fillers- nano particles and nano clusters which allow higher filler loading, thereby, exhibiting high strength of hybrids and high polishability.

With ongoing focus to facilitate greater degree of monomer conversion, that in turn enhances physical, mechanical and chemical properties, as well as clinical performance in composite resins3 newer curing units have also been developed like QTH, Light Emitting Diodes (LEDs), Plasma Arc (PAC), or laser curing lights. Though halogen-curing lights have been popular for polymerization, they present certain disadvantages like heat generation that can possibly harm the dental pulp, bulb silvering that reduces the intensity of emitted light, gradual loss of light output and frequent bulb-replacement.4

The introduction of LEDs, based on gallium nitride technology, in 1995 is the latest innovation to address the shortcomings in composite materials and light curing units. LEDs use doped semiconductors for the generation of light and present a spectral bandwidth of 440-500nm. They produce minimal heat. Though manufacturers claim better efficiency of LEDs over halogen curing units, there is little information concerning their efficacy in the dental literature.

Hence, this in-vitro study evaluated depth of cured

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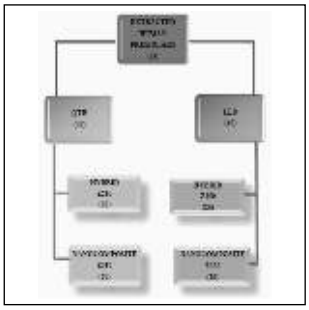
resin as an estimation of degree of conversion of monomer into polymer in brass molds restored with the microhybrids and nano-composite resins when exposed to QTH curing unit and LEDs.

MATERIALS AND METHODS

The composite resins used in the study included microhybrids (Filtek Z250, 3M ESPE) and nanocomposites (Filtek Z350, 3M ESPE). The light cure units used in the study were- QTH: CU 100 A (Q-LUX) and LED: LITEXTM 695 (DENTAMERICA). The light intensities of both the curing units were comparable (CU-100A: 540mW/cm2; LITEX TM 695: 508mW/cm2).

The Degree of Conversion was evaluated according to the procedure defined by the 'International Standard Organization for Standardization 4049: 2000 (E) 5, for resin – based filling materials. Forty cylindrical brass molds were prepared. Each cylinder had 4mm of internal diameter and 6mm of length. All the molds were measured for accuracy using a 'mm scale' and were standardized to ± 0.2 mm. All the molds were divided into 4 experimental groups of 10 samples each as in Figure 1.



Group wise, each mold was filled with respective composite resin with the help of Teflon coated composite filling instrument, while stabilizing the bottom surface of mold on a glass slab.
Another transparent glass slab was placed on the top surface of the filled mold to extrude any extra resin out of the mold. After removal of the glass slab, a mylar strip was placed on the top surface of the mold. While keeping the tip of respective curing unit on the upper surface of mylar strip, the specimen was cured for recommended time (as per the manufacturer's instructions). Any soft (unpolymerized) composite resin was scraped off from the bottom surface with the help of Teflon coated cement carrier.

The measurement of Degree of Conversion was carried out with the help of Digital Micrometer' and the Digital Callipers', readings were taken for each sample. The digital micrometer measured the highest point of unevenly scraped material and Digital Callipers measured the deepest point of unevenly scraped material.

STATISTICAL ANALYSIS.

Souce of Support: Nill, **Conflict of Interest:** None declared

The statistical analysis for the Degree of Conversion in Hybrid composite resins and Nanocomposite resins on exposure to QTH and LED was analyzed using One- way ANOVA followed by Independent t-tests.

ONE-WAY ANOVA

$$N = n_1 + n_2 + \ldots + n_k \quad \text{and} \quad \bar{X}_j = \frac{\sum_{j=1}^{k} n_j \bar{X}_j}{N}$$

$$SS_{total} = SS_{err} = \sum_{j=1}^{k} \sum_{i=1}^{n_j} (x_{ij} - \bar{x}_j)^2 = \sum_{j=1}^{k} \sum_{i=1}^{n_j} x_{ij}^2 - \frac{\left(\sum_{j=1}^{k} \sum_{i=1}^{n_j} x_{ij}\right)^2}{N}$$

$$SS_{treat} = \sum_{j=1}^{k} n_j (\bar{x}_j - \bar{x})^2$$

INDEPENDENT t-TEST

$$t = \frac{\bar{x}_1 - \bar{x}_2}{\sqrt{\frac{s_1^2 + s_2^2}{N}}}$$

RESULTS:

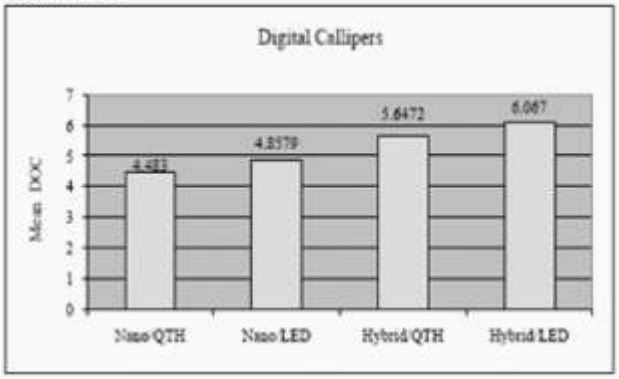
Table 1 and Graph 1 shows the Degree of Conversion measured by Digital Vernier Callipers in each sample in all the experimental groups. It showed that Hybrid Composite showed significantly greater Degree of Conversion ($p < 0.05$) than Nanocomposite on exposure to QTH and LED.
Comparing the means, Degree of Conversion for experimental groups was observed in the following order-

Hybrid Composite exposed to LED > Hybrid Composite exposed to QTH > Nanocomposite exposed to LED > Nanocomposite exposed to QTH.
Table 2 and Graph 2 show the Degree of Conversion measured by Digital Micrometer in each sample in all the experimental groups. Table 3 and Graph 3 show the Mean Values for Degree of Conversion measured by 'Digital Micrometer and Digital Vernier Callipers' in each sample in all the experimental groups.
Both micrometer readings and 'mean of Micrometer and Digital Caliper readings' showed that statistically, HYBRID COMPOSITE showed significantly greater Degree of Conversion ($p < 0.05$) than Nanocomposite on exposure to QTH and LED. Statistically, there was no significant difference in Degree of Conversion for Hybrid Composite exposed to QTH and LED. However, significant difference was observed for LED and QTH curing units in polymerizing Nanocomposites with LED causing greater degree of conversion than QTH. Hence, both micrometer readings and 'mean of Micrometer and Digital Caliper readings' showed that Degree of Conversion was observed in following order-
Hybrid Composite exposed to LED = Hybrid Composite exposed to QTH > NanoComposite exposed to LED > NanoComposite exposed to QTH.
Hence, it can be concluded that Hybrid composites when exposed to LED exhibited greater Degree of Conversion than nanocomposites.

TABLE 1

S.No.	Nano/QTH	Nano/LED	Hybrid/QTH	Hybrid/LED
1	4.38	4.71	6	6
2	4.61	4.48	5.89	6.01
3	4.8	4.62	5.99	6.1
4	4.84	5.369	6.002	6
5	4.42	5.21	5.62	6.26
6	4.7	4.58	5.64	6.1
7	4.45	5.08	5.12	6
8	4.08	5.22	5.78	6.1
9	4.14	4.81	5.88	6
10	4.41	4.5	4.55	6.1
Mean	**4.453**	**4.8579**	**5.6472**	**6.067**
S. Dev	**0.2565173**	**0.3324216**	**0.469187**	**0.08354**

GRAPH 1

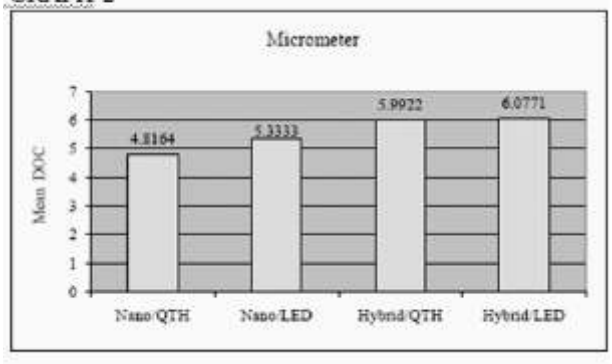


Degree Of Conversion Measured By Digital Vernier Callipers In Each Sample In All The Experimental Groups.

TABLE 2

S.No.	Nano/QTH	Nano/LED	Hybrid/QTH	Hybrid/LED
1	4.569	5.323	6.038	6.023
2	4.696	5.392	5.974	6.123
3	4.841	4.647	6.12	6.112
4	4.844	5.02	6.023	6.003
5	4.555	5.242	6.113	6.124
6	5.118	5.712	6.013	6.133
7	4.839	5.649	5.898	6.004
8	4.996	5.715	5.883	6.134
9	4.71	5.468	6.11	6.001
10	4.996	5.167	5.75	6.114
Mean	**4.8164**	**5.3333**	**5.9922**	**6.0771**

GRAPH 2

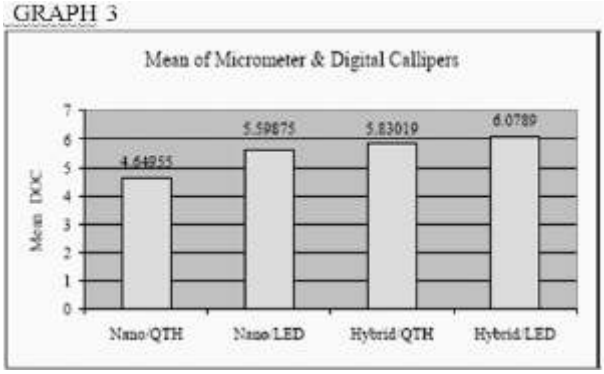


DEGREE OF CONVERSION MEASURED BY DIGITAL MICROMETER IN EACH SAMPLE IN ALL THE EXPERIMENTAL GROUPS.

TABLE 3

S.No.	Nano/QTH	Nano/LED	Hybrid/QTH	Hybrid/LED
1	4.4745	5.016	6.019	6.0115
2	4.648	4.936	5.932	6.066
3	4.8205	9.267	6.055	6.106
4	4.842	5.1945	6.0125	6.001
5	4.4875	5.226	5.9165	6.262
6	4.909	5.146	5.826	6.116
7	4.648	5.364	5.509	6.002
8	4.538	5.866	5.8315	6.117
9	4.425	5.139	6.0454	6.0005
10	4.703	4.833	5.155	6.107
Mean	**4.64955**	**5.59875**	**5.83019**	**6.0789**
S.Dev	**0.168723**	**1.319365**	**0.287251**	**0.082136**

GRAPH 3



MEAN VALUES FOR DEGREE OF CONVERSION MEASURED BY DIGITAL VERNIER CALLIPERS & MICROMETER IN EACH SAMPLE IN ALL THE EXPERIMENTAL GROUPS

DISCUSSION:

Degree of Conversion is defined as the percentage of carbon double bonds converted to single bonds during the polymerization reaction.6 Measurement of the degree of conversion on material is the most sensitive indicator of depth of cure7. In the present study, Scraping Method was chosen because it was simple to perform, reproducible and extensively used by other researchers.8 The Degree of Conversion was evaluated according to the procedure defined by the 'International Standard Organization for Standardization 4049: 2000 (E)' for resin – based filling materials.9

Opaque moulds are used to avoid transmission of light from mould to the composite material. Brass molds were used for the study because they were easily available and satisfied the criteria for mould being opaque.7 After curing, the specimens were evaluated for degree of conversion using micrometer as per ISO Specification 4049: 1988.7 The depth of cure is greater at center than at the edge indicating non-uniform depth of cure of restorative resin across the area of the mould. Scraping pattern of uncured material from the bottom of the mould in our study is in accordance with this observation. Hence, in order to obtain reproducible and comparative results, measurements should always be taken in the center of the mould with the help of micrometer.7 However, in order to obtain exact degree of conversion in all the samples in all the groups, readings for degree of conversion were also taken with the help of Digital Callipers.

Micrometer and mean of Micrometer and Digital Vernier Callipers readings indicated higher degree of polymerization in hybrid composites as compared to nanocomposites on exposure to both the light cure units which is again attributed to increased microgap

formations in nanocomposites due to higher filler loading. Also, smaller sized particles in nanocomposites cause scattering of light and decrease it's absorption, thereby, reducing the overall polymerization of material.9 Comparing the curing units, statistically no significant difference was observed for LED and QTH curing units in polymerizing Hybrid Composites. However, regarding nanocomposites, LEDs were found to produce greater degree of conversion than QTH. Such a result can be attributed to narrow spectrum of LEDs which is more close to the absorption spectrum of photoinitiator (Camphorquinone) present in nanocomposite. However, Vernier Calliper readings suggested that LEDs caused greater degree of conversion than QTH in both the composites. Hence, it can be concluded that LED LCUs were as effective as/or more effective than a halogen LCU for polymerization of the composite. It is in accordance with the studies carried out by other researchers.10, 11

CONCLUSION

Within the limitations of this study, it can be concluded that Hybrid composites exhibited greater degree of conversion than Nanocomposite resins which can be attributed to higher filler load and decreased particle size of Nanocomposites. LEDs were found to cause greater degree of conversion than QTH in both the composites which can be attributed to its narrow emission spectrum.

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Original Article

Antimicrobial efficacy of spray disinfectants on dental impressions.

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Abstract

The objective of the study was to evaluate the efficacy of 0.5 % Sodium hypochlorite and 2% Glutaraldehyde spray disinfectants on Impression compound and Irreversible hydrocolloid impressions.

Methods:

Twenty edentulous patients with the age group of 45 – 65 years were randomly selected for the present study. Maxillary and mandibular impressions of 10 patients were taken in impression compound and for remaining 10 in alginate.Out of all 40 impressions, each was swabbed and incubated on nutrient agar culture media. This constituted the control group. Twenty maxillary and mandibular compound impressions were divided into two groups of 10 each. Samples of each group were sprayed with 0.5 % Sodium hypochlorite and 2% glutaraldehyde respectively. Twenty alginate impressions received the similar disinfection treatment. After 10 minutes the impressions were reswabbed and incubated for 24 – 48 hours and microbial colony count was carried out.

Results:

It was observed that there was presence of numerous bacteria both gram positive and gram negative, on Compound and Irreversible hydrocolloid impressions taken from edentulous patients. Both these disinfectant were found to be highly effective as 90- 100% bacteria could be eliminated.

Conclusions:

Within the limitations of the study it was concluded that 2% Glutaraldehyde and 0.5% Sodium hypochlorite was statistically equally effective both against gram positive and gram negative organisms. Sodium hypochlorite 0.5% was found to be marginally more effective than 2% glutaraldehyde on Irreversible hydrocolloid.

Key words

Impression compound, Irreversible hydrocolloid, Glutaraldehyde, Sodium hypochlorite, Spray disinfectants.

INTRODUCTION

Prosthodontic patients are generally a high risk group relative to their potential to transmit infectious diseases as well as acquire them. There has been a recent increased awareness of the need for cross infection control measures to protect against possible routes of transmission frequently ignored in the past. Cross contamination control measures are considered within several categories such as Patient evaluation, Personal protection, Instrument and equipment contamination, Clinical technique, Impression handling and Laboratory asepsis.1 It was in the 1980s a new era in field of dentistry, where cross infection control, chemical hazards, communications and infectious waste management was highlighted to signify a great change in clinical practice2. In dentistry all the clinical procedures are undertaken in an environment in which there is saliva and blood contaminated with micro-organisms. The standard procedure of rinsing impressions under running tap water immediately after removal from the mouth prevents only a gross removal of contamination with saliva and blood and does not completely eliminate all microorganisms. Surface disinfection to inactivate infectious agents is highly desirable to reduce the potential transmission of disease to dental personnel from contaminated impressions.3 A number of professional organizations have issued recommendations for cross infection control, but there is an inadequate implementation regarding the ease with which the oral micro-organisms can be removed by disinfectants from impression material and cast. 4, 5

To prevent cross contamination during clinical and laboratory procedures between patients, operator and technicians, several new products are being continuously developed. Among these 0.5% Sodium hypochlorite and 2% Glutaraldehyde have been considered effective. Spray disinfectants are preferred, as dimensional changes in the alginate impression material are seen when immersion disinfectants are used.6 Earlier studies have been made to ascertain the antimicrobial properties of 0.5% sodium hypochlorite on irreversible hydrocolloid impression material.3,7,8,9,10 A few of the studies have been done to assess the antiviral properties of 0.5% sodium hypochlorite and 2% glutaraldehyde on irreversible hydrocolloid impression material11. There is no comparative study to evaluate the antimicrobial effectiveness between 0.5% sodium hypochlorite and 2% glutaraldehyde on irreversible hydrocolloid. Further, most of the disinfectant studies conducted on irreversible hydrocolloid impressions were obtained from typhodont models, which were later kept in an

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artificial salivary broth. Hence, this in vitro study was conducted to find out the effectiveness of two disinfectants against microorganisms on the impression compound and irreversible hydrocolloid impressions.

METHODS:

Twenty edentulous patients with the age group of 45-65 years were randomly selected for the study. A short medical history was taken and a thorough oral examination was carried out to exclude the presence of local or systemic disorders.Selection was based on the consent of patient to participate. Impression compound (DPI Pinnacle, Dental Products of India, Mumbai) and an irreversible hydrocolloid impression material (Alginate- Zelgan 2002, Dentsply India pvt. ltd., Gurgaon) were used to take the impression of the patients. The spray disinfectants used in the study were; 0.5 % Sodium hypochlorite (Organo biotech industries Calcutta) and 2% Glutaraldehyde (Johnson & John- son of India, Ltd.,Bombay). Prior to taking the impressions all the patients were asked to rinse once with water. Suitable stock metal tray was used for the impression. Total 40 impressions of maxillary and mandibular ridges were taken out in 20 patients, which were initially divided into two groups of each containing 20 impressions:Group A – 10 maxillary and 10 mandibular impressions taken in Impression compound. Group B – 10 maxillary and 10 mandibular impressions taken in Alginate.

After removal from the mouth the impression was washed with running tap water for 15 second to remove excess saliva. Prior to disinfection, the impression that was used for the study constituted the control group and the same was used as test group after disinfection. For this purpose, each of the impression was numbered on back of it.

Pre Disinfection Microbial colony count

For this purpose the surface of each of the impression was swabbed with dry sterile cotton swab for 30sec (figure 1).The swab was then immediately applied to nutrient agar culture media for microbiological sampling (figure 2). The swab of each of the 40 samples was incubated aerobically at 37°C for 24-hours and also incubated for micro-aerophyllic condition by providing 5-10% CO2. Then the microbial colony count was carried out accordingly and findings were recorded (figure 3).

Disinfection procedure

Group A and B impressions were reused in disinfection procedure, which were further divided into four groups, each comprised five maxillary and five mandibular impressions:Group A1 – included 10 impressions of Impression compound, sprayed with 0.5 % Sodium hypochlorite spray disinfectant.

Group A2 - included 10 impressions of Impression compound, which were sprayed with 2% Glutaraldehyde.
Group B1 – included 10 alginate impressions, disinfected with 0.5 % Sodium hypochlorite spray disinfectant.
Group B2 – included 10 alginate impressions, disinfected with 2 % Glutaraldehyde.
It was insured that even distribution of disinfectant occurred and no area was left uncovered. After disinfection, each of the impression was kept in air tight polythene bag for 10 minutes.

Post Disinfection Microbial Colony recount

After a period of 10 minutes, each of the impression was removed from the polythene bag and again swabbed with dry sterile cotton swab for 30sec. The swab was applied to nutrient agar culture media for microbial sampling and incubated for 24-48 hours (figure 4). The microbial colony count was then carried out (figure 5, 6, 7). All the 40 impressions were treated in similar manner. The results were recorded, analyzed and compared with the control and were subjected to statistical analysis.

RESULTS:

The disinfectant effect of 0.5% Sodium Hypochlorite and 2% glutaraldehyde on gram positive and gram-negative bacteria on impression compound and alginate impressions, before and after disinfection is shown in table 1 and 2. In case of impression compound, colony count before disinfection with 0.5% sodium hypochlorite spray was 104 CFU/ML (Colony Forming Unit) for gram positive organisms and for gram negative it was 103 CFU/ML. After disinfection the colony count was reduced to 0 CFU/ML for gram positive organisms and for gram negative it was 0.5×101 CFU/ML. Colony count before disinfection with 2% glutaraldehyde spray for gram positive organisms and gram negative organisms was 104 - 105 CFU/ML and after disinfection the colony count was reduced to 102 CFU/ML for gram positive and gram negative organisms.

However in case of alginate, colony count before disinfection with 0.5% sodium hypochlorite spray was 105 CFU/ML for gram positive and 104 CFU/ML for gram negative organisms, and after disinfection the colony count was reduced to 0 CFU/ML for gram positive organisms and for gram negative it was 101 CFU/ML. Colony count before disinfection with 2% glutaraldehyde spray for Gram positive organisms and gram negative organisms was 104 CFU/ML and after disinfection, the colony count was reduced to 102 CFU/ML for gram positive organisms and 0.55×102 CFU/ML for gram negative organisms.

DISCUSSION:

Minimizing the risk of disease transmission in the dental workplace has today become a high priority for the dental profession. Contaminated materials are routinely sent to dental laboratories thus creating an occupational hazard.Microbial contamination of dental materials and prosthesis has been documented by the work of Wakefeld et al12. Such pathogenic contaminants include bacteria such as E.coli, Staphylococcus aureus, Streptococcus mutans, Yeast and Candida albicans. In one study Samaranayake et al 13 found the coliforms organism E.coli and fungus C.albicans to be more persistent on impression materials than Staphylococcus aureus or Streptococcus mutans. A routine procedure of disinfection should be done on primary and secondary impressions to reduce the risk of contamination of the casts. Casts which are not disinfected carry the virus, micro-organisms from the oral cavity and some of them survive for longer periods. The dentists, their assistants, and technicians face the hazard of getting infected from some of the pathogenic organisms contained on the cast. Therefore, there is a need to effectively disinfect these impressions. 14
The present study was carried to evaluate the efficacy of 0.5% Sodium hypochlorite and 2% Glutaraldehyde disinfectants on edentulous impressions. These disinfectants were used to spray the impression in an even manner to coat the impression surface. These disinfectants have been shown to be most effective amongst other disinfectants as reported by Storer and Mc Cabe.15 Swabs for culture taken before and after the disinfection were inoculated on culture media nutrient agar to see the growth of gram positive and gram negative organism. This bacteriological investigation was done to assess the growth of bacterial colonies and their species. These disinfectants can be used either in form of immersion or as spray disinfectant. Immersion disinfectant though effective, they are not as satisfactory as spray, considering their adverse effect on the dimensional stability. Spray disinfectants are therefore superior and produce good disinfection.

Considering this, spray disinfectants were selected to study their antimicrobial effect.

Among the two impression materials used for edentulous impression, it has been reported that Irreversible hydrocolloid material has an intrinsic retentive potential for microbes as compared to impression compound materials and is therefore potentially more difficult to disinfect. It has been reported by Samaraayanke et al13 that Irreversible hydrocolloid impression carry three to four times more organisms than impression compound. This is yet another reason for including Irreversible hydrocolloid in this study. A few of the earlier investigators have studied the disinfection of irreversible hydrocolloid impression by an indirect method of taking hydrocolloid impression in a typhodont and later exposing the impression to an artificial saliva broth containing selected groups of bacteria after rinsing the impression in running water.14 Swabs were then made and inoculated in culture media. It is felt that a direct study involving the microorganisms carried on the impressions from the oral cavity will be more accurate to assess the efficacy of disinfectants. Therefore in the present study a direct method was preferred. The subjects were randomly selected and the impressions were made which were later disinfected with 0.5% Sodium hypochlorite and 2% Glutaraldehyde.

The data collected was based on the colony forming units in the culture media .These were counted with colonycounter and the counts were expressed under the standard method of recording microbial colony count (CFU COUNT).The bacteriological investigation clearly demonstrated that the colony forming units recovered before disinfection were much greater than after disinfection. It was also seen that both 0.5% Sodium hypochlorite and 2% Glutaraldehyde solution were more effective on gram positive organisms such as Streptococcus mutans, Viridians, Peptostreptococcus than gram negative organisma such as Prevotella, Pseudomonas, Klebsiella. Sodium hypochlorite 0.5% was marginally more effective than 2% Glutaraldehyde on gram positive as well as gram negative organisms.

The results of this study clearly indicated that both the disinfectants revealed a statistically significant difference as compared to controls, both in case of compound impressions as well as alginate impressions. This is based on the fact that the disinfection efficacy ranged between 92% - 99.97% considering all the situations.

One of the significant findings of the study was the isolation of Clostridium Tetani 104 CFU/ML in the Impression compound impression of one of the subjects before disinfection. It was completely eradicated after disinfection with 0.5% Sodium hypochlorite. Thus the presence of Cl. Tetani in one of the impressions, even though statistically insignificant and of low incidence, its presence is very alarming and lays emphasis on disinfection of impressions in routine dental practice. Though most of the organisms cultured were commensals and grouped as non-pathogenic, they might be able to cause cross infection if their virulence and number is high or the resistance of host is compromised. This study was carried out on edentulous patients. It was presumed that dentulous patient and those having any oro- dental pathology have the potential to transmit the infection to dental personnel. This study showed the importance of disinfecting the impressions as a precautionary measure in order to prevent cross infection in the dental clinic and the dental laboratory.

CONCLUSIONS:

Within the limitations of the study, following conclusions were drawn:

1. The antimicrobial activity of spray disinfectants - 2% Glutaraldehyde and 0.5% Sodium hypochlorite was found statistically to be equally effective both against gram positive and gram negative organisms.
2. Sodium hypochlorite 0.5% was marginally more effective than 2% Glutaraldehyde on alginate impression material.
3. Both the disinfectants were found to be equally effective on impression compound.
4. Sodium hypochlorite 0.5% is more effective on alginate impression material as compared to impression compound.

Hence, routine disinfection of impressions using either of the disinfectant is preferred to prevent cross infection in dental practice.

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Table - 1
Comparative evaluation of 0.5% sodium hypochlorite and 2% glutaraldehyde - before and after disinfection on impression compound impressions

Impression compound impressions

Group	Condition	Type of organisms									
		Colonies of gram positive organisms					Colonies of gram negative organisms				
		Minimum	Maximum	Median	Mean	Standard deviation	Minimum	Maximum	Median	Mean	Standard Deviation
A	Pre Disinfection	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
A1	After Disinfection	0.00	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
A	Pre Disinfection	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
A2	After Disinfection	0.00	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Foot Note: Group A1: 0.5% Sodium hypochlorite
Group A2: 2 % Glutaraldehyde

Table - 2
Comparative evaluation of 0.5% sodium hypochlorite and 2% glutaraldehyde - before and after disinfection on

Group	Condition	Type of organisms									
		Colonies of gram positive organisms					Colonies of gram negative organisms				
		Minimum	Maximum	Median	Mean	Standard deviation	Minimum	Maximum	Median	Mean	Standard Deviation
B	Pre Disinfection	1000.00	100000.00	100000.0	72100	44990	0.00	100000.00	10000.00	15210	30163.57
B1	After Disinfection	0.00	100.00	0.00	30	48.30	0.00	100.00	10.0	43	49.22
B	Pre Disinfection	1000.00	100000.00	10000.00	35200	44859.78	0.00	10000.00	10000.00	17000	29458.07
B2	After Disinfection	0.00	100.00	100.00	72.00	45.16	0.00	1000.00	55.00	143	304.74

alginate impressions

Foot Note: Group B1: 0.5% Sodium hypochlorite
Group B2: 2 % Glutaraldehyde

FIGURE LEGENDS:

Figure 1- Collecting swab from impression
Figure 2- Colonial growth before Disinfection of impression
Figure 3- Micro organisms Colony counter
Figure 4- Colonial growth after disinfection
Figure 5- Colony forming units as seen through Colony counter
Figure 6- Colonies of Gram – ve bacteria
Figure 7- Colonies of Gram + ve bacteria

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Original Article

Quantitative method of determining condylar position in patients with temporomandibular disorders versus asymptomatic normal subjects.

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Abstract

The signs and symptoms of temporomandibular disorders may be due to the change in the position of the condyle in the glenoid fossa. Guiding the condyle into centric position in the glenoid fossa has given positive results in the management of signs and symptoms associated with TMD. The aim of the study was to compare the position of the condyle between patients with signs and symptoms of temporomandibular disorders and normal asymptomatic subjects.

Material and method

106 subjects of Bangalore of Indian origin aged between 18-48 years were selected for the study. The subjects were divided into divided into 2 groups, asymptomatic subjects (group I) and subjects with signs and symptoms of temporomandibular disorders (group II). The lateral tomogram of the TMJ in both open and closed positions were taken. The condylar position index (CPI) was calculated which indicated in percent an anteriorly positioned condyle when the value was positive and a posteriorly positioned condyle when the value was negative. CPI was calculated using the following formula: $CPI = 100 \times (pjs - ajs)/(pjs + ajs)$.

Results

The CPI value between the group I subjects and group II subjects was statistically significant (p=0. 003) and the correlation between the anteiorly placed condyle, posteriorly placed condyle and concentrically placed condyle between the DDWR, DDWoR and normal subjects was statistically significant (p= < 0.001).

Conclusion

The quantitative value of the condyle position has considerable potential usefulness because it will permit differentiations to be made between condyle positions, whether in different TMJs or in the same TMJ over an interval of time.

Key words

Disc Displacement, Condyle Postion Index, Anterior Joint Space, Posterior Joint Space.

INTRODUCTION

The term temporomandibular disorder (TMD) is defined as "collective term embracing a number of clinical problems that involve the masticatory musculature, the temporomandibular joint and associated structures, or both. Temporomandibular disorders are considered to be a sub-classification of musculoskeletal disorders and are a major source of orofacial pain of non-dental origin 1.

The mandibular condyle sits in the glenoid fossa of the temporal bone forming the temporomandibular joint. Ideally the condyle should be positioned centered in the fossa about 1.5 mm from the articular eminence, 2.5 mm below the roof of the articular fossa and around 7.5 mm from the center of external auditory meatus 2. It has been proposed that the signs and symptoms of temporomandibular disorders are due to the change in the position of the condyle in the glenoid fossa 3. Some studies dispute the role of condylar position in the pathogenesis of temporomandibular disorders due to the fact that there is a large variation in the position of the condyle in patients with temporomandibular disorders 4. Guiding the condyle into centric position in the glenoid fossa has given positive results in the management of signs and symptoms associated with TMD 5

The present study compared the position of the condyle in subjects with signs and symptoms of TMD with that of asymptomatic subjects.

MATERIAL AND METHODS

106 subjects of Bangalore of Indian origin aged between 18-48 years were selected for the study. The subjects were divided into divided into 2 groups, asymptomatic subjects (group I) and subjects with signs and symptoms of temporomandibular disorders (group II). The sample consisted of patients with normal occlusion, malocclusion or those requiring orthodontic treatment. Patients presenting with

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developmental abnormalities of the temporomandibular joints, subjects below 18 years of age and pregnant women were excluded from the study.

All the subjects were selected from the out patient department of Oral Medicine and Radiology. After explaining the need for study their consent was obtained on a consent form. A detailed case history and clinical examination was performed on the subjects by using a case history format.

Based on the history and clinical findings, individuals were categorized as normal subjects or subjects with the disc displacement with reduction and subjects with disc displacement without reduction. Disc displacement with reduction was diagnosed when there was clicking on both vertical opening and closing that occurs at a point at least 5mm (interincisal opeing) greater than on closing, is eliminated on protrusive opening , and is reproducible in two of three consecutive trails or click on opening or closing and click on lateral excursion or protrusion, reproducible in two of three consecutive trials.6 Disc displacement without reduction was diagnosed when there was history of significant limitation of opening, maximum unassisted opening lesser than or equal to 35mm,

passive stretch increases opening by lesser than or equal to 4mm, and contralateral excursion lesser than 7mm and/or uncorrected deviation to the ipsilateral side on opening and absence of joint sounds or sounds that do not meet criteria for disk displacement with reduction. 6

METHODOLOGY

For the study a lateral tomogram of the TMJ in both open and closed positions were taken on GENDEX Orthoralix 9200 panoramic machine. Two sets of readings were recorded at an interval of one week for the lateral tomogram. The mean of both the readings were recorded. Both right and left TMJ regions were traced on tomograms of all the subjects.

A baseline was drawn on the tracing paper by connecting the highest point of the post glenoid process to the crest of the articular eminence. A tangent was drawn to the articular fossa. A perpendicular line was drawn from the highest point on the articular fossa to the base line From this point again a perpendicular line was drawn from the tip of the post glenoid process height to the tangent drawn to the curve of the articular fossa. Another perpendicular line was drawn from the crest of the articular eminence to the tangent drawn to the curve of the articular fossa. Two lines at 60 degrees angle each–running anteriorly and posteriorly - were drawn from the point of intersection of the perpendicular line from the greatest curvature of articular fossa and the baseline.

With these demarcations anterior joint space (ajs) -smallest distance between anterior surface of condyle and fossa and posterior joint space (pjs) - smallest distance between posterior condyle and fossa, measurements were made (Figure 1).

The condylar position index (CPI) was calculated which indicated in percent an anteriorly positioned condyle when the value was positive and a posteriorly positioned condyle when the value was negative. CPI was calculated using the following formula: $CPI = 100 \times (pjs - ajs)/(pjs + ajs)$.

Results

In subjects with DDWR, the mean of CPI was -7.817 with a standard deviation (SD) of ±20.26 and range of -60.0 – 33.33. In subjects with DDWoR, the mean of CPI was -3.465 with a standard deviation (SD) of ±12.03 and range of -20.0 - 11.11. In subjects under group I, the mean CPI was -5.91 with a SD of ±18.56 and range of -60.0 – 33.33. In subjects under group II, the mean CPI was 1.83 with a SD of ±5.33 and range of -5.88 – 33.33. The CPI value between the group I subjects and group II subjects was statistically significant (p=0. 003) (Table 1)

In group II, out of 56 subjects, 20 subjects (35.71%) had a positive CPI value indicating an anteriorly positioned condyle; 08 subjects (14.28%) had a negative CPI value indicating a posteriorly positioned condyle and 28 subjects (50.0%) had CPI value as zero indicating a concentrically placed condyle. The correlation between the anteiorly placed condyle, posteriorly placed condyle and concentrically placed condyle between the DDWR, DDWoR and normal subjects was statistically significant ($p = < 0.001$)(Table2).

Discussion

Condyle position index (CPI) indicates whether the condyle is concentric, anterior or posteriorly positioned in the articular fossa. In the present study 29 out of 50 subjects who showed signs and symptoms of TMD had a negative CPI value indicating a posteriorly positioned condyle, 14 subjects had a positive CPI value indicating anteriorly positioned condyle and 7 subjects had a CPI value of 0 indicating a concentrically placed condyle. Out of 56 normal subjects, 28 subjects had a CPI value of 0, 20 subjects had a positive CPI value and 8 subjects had a negative CPI value. Based on the CPI values of the study it could be stated that majority of the normal condyles were placed concentrically or anteriorly in the fossa where as majority of the condyles in subjects with TMD were placed posteriorly in the fossa.

Condylar position is significantly associated with disc displacement, especially in joints with reducible disc displacement. The condyle tends to be dislocated posteriorly in these joints as compared with those with normal subjects. It has been suggested that the condyle may shift posteriorly in the early stages of the internal derangement 7. TMJs diagnosed with anterior disc displacement without reduction may have a posterioly placed condyle when compared to normal subjects 8.

In the study on subjective evaluation of condylar position on tomograms with arthrographic interpretation of disc position, showed that without tomographic evidence of degenerative joint disease, a statistically significant 88% to 90% of the TMJs with anterior disc displacement had condyles that were retropositioned in the fossa. Forty-two percent of the TMJs with normal disc position had posterior displacement of the condyle 9.

The occlusal pressure transmitted into the joint compartments makes the condyle slide posteriorly whereas the articular disc may be deformed and displaced from its normal position. 1.

The condylar retrusion may be secondary to altered disc position or a result of increased condylar and eminence remodeling. It may also be attributed to the rotation of the condyle posteriorly in the fossa, secondary to a fulcrum effect at the second molar, with loss of the posterior band of the disc from the height of the mandibular fossa and potential shortening of the mandibular ramus characteristic of these patients 10.

It is hypothesized that condyle position is a predictor of derangement, but mostly as an interaction with fossa shape. In the case of posterior position, a small initial forward translation movement of the condyle occurs in protrusion, equiv-alent to an auxiliary movement, until the rotational influence of the articular eminence slope is reached. This may lead to disc and disc attachment distortion and laxity in susceptible individuals and to frictional movements. On jaw closure, the nonworking side is initially more loaded and follows the most superior translation pathway, while a degree of distortion and laxity of the condyle is seen on working side until the load is transferred to the dentition in intercuspal occlusion. This may lead to the posterior positioning of the condyle, thereby propagating disk and disk attachment changes in susceptible individuals 11.

The quantitative nature of the CPI allows a definitive comparison of condyle position, even when actual differences between joints might be very small. A calculated CPI of -2, for example, would denote a less

protruded condyle than would -1, though such a difference would not be appreciated subjectively.

Gross condyle position differences can, of course, be detected subjectively by experienced clinicians. However, subtle changes in condyle position will continue to remain beyond the discriminatory capabilities of even the most astute clinician or radiologist. In addition, quantification of condyle position data will probably be critical in understanding the relationships between the osseous and soft tissue components of the TMJ. These reasons form the rationale for the continued development of the TMJ measurement method described and for further evaluation of its usefulness 12.

CONCLUSION

The quantitative value of the condyle position has considerable potential usefulness because it will permit differentiations to be made between condyle positions, whether in different TMJs or in the same TMJ over an interval of time, even when the changes are so slight as to be un-observable to the human eye or on a radiograph. This may help the clinician in observing the progress of the TM joint pathology and also the efficacy of management strategies employed to treat the TMD.

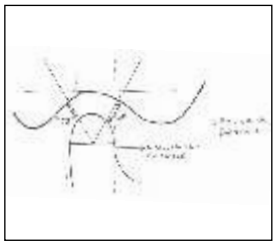

Figure 1:
Schematic diagram showing the measurement of condylar position index (CPI)

Table 1: Condyle Position Index (CPI) between study group and control group

Group	N	Mean CPI	Std. Deviation	Minimum	't' value	'p' value
Study	57	-5.9135	18.56310	-60.00	9.021	.003
Control	56	1.8332	5.33009	-5.88		

Table 2: Condylar Position Index (CPI)=(PJS-AJS/PJS+AJS) X 100.
CPI positive value= anteriorly placed condyle
CPI negetive value = posteiorly placed condyle
CPI = 0 concentrically placed condyle

Diagnosis	CPI +VE VALU%	CPI-VE VALUE%	CPI0%
DDWR (42)	11 (26.19%)	25 (59.52%)	6 (14.28%)
DDWOR (8)	3 (37.50%)	4 (50%)	1 (12.5%)
3. Normal (56)	20 (35.71%)	08 (14.28%)	28 (50%)

$\chi 2 = 25.77$
d.f=4 p value=<0.001.

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Souce of Support: Nill, **Conflict of Interest:** None declared

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Case Report

ALL CERAMIC CROWN – AN ENHANCED ESTHETICS

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Abstract

Dentistry today not only focusing on prevention and treatment of diseases but also fulfilling the demand of the people for better aesthetics. Recent advances in technology and dental materials have prompted the development of a large number of all-ceramic systems for fabrication of full coverage restoration. These crowns are clinically more acceptable due to their enhanced aesthetic, biocompatibility and inertness and they are replacing metal as a core material for crown. Development of digital technology have improved the accuracy and aesthetics of all ceramic system and are providing better aesthetics than previous all ceramic system. This case report presents the management of a central incisor with an all-ceramic system..

Key words
All ceramic crowns, Full coverage restoration, Zirconia.

INTRODUCTION

All ceramic crowns were used to be made up of single layer glass ceramic. Their failure rate was high in certain cases.1,2 A new system was developed to overcome these failures by utilizing a bilayer design, where an Alumina base core either glass infiltrated (Inceram, Vivadent)3 or densely sintered (Procera, Novel Biocare) 4,support the veneering porcelain applied over this core for aesthetic purpose. These systems have shown a lower failure rate for single crown.5 Recently, densely sintered Zirconia based cores have been introduced.6,7 These ceramic systems utilize Yttrium-Tetragonal Zirconia polycrystal (Y-TZP or partially stabilized Zirconia) for the fabrication of anterior and posterior crown and fixed partial dentures. “Transformation toughing” where the presence of stabilizing oxide yttrium oxide holds the material in a stable tetragonal state, provides a unique toughing mechanism to enhance the ceramic properties for load-bearing application.8 Y-TZP has flexure strength of 900 to 1200 MPA, which is considerably higher than that reported for densely sintered alumina9 and glass infiltrated alumina / zirconium dioxide material.10 In addition, Y-TZP does not seem to be as sensitive to moisture - induced strength degradation as other ceramics.11 The present case report describes the restoration of an upper right maxillary central incisor with Zirconia all ceramic Crown (Lava).

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CASE REPORT

A 24-year-old girl reported to the Department of Prosthodontics with gray discoloration of gums in relation to upper right front tooth region. The dental history revealed that she got her maxillary right central incisor (11) fractured ten years back which was later root canal treated and a metal-ceramic crown was cemented on the same.

Clinical examination showed the deposition of plaque and mild staining of teeth. The clinical crown of tooth 11 was short as compared to the tooth 21 and there was diastema (Figure 1).

An intra oral periapical radiograph of maxillary central incisors revealed post and core in tooth 11 as shown in figure 2,

and root canal treatment in tooth 12. There was no periapical radiolucency present in relation to any of the tooth. The treatment Plan included oral prophylaxis, removal of metal-ceramic crown, crown lengthening and fabrication of an all ceramic crown on tooth 11.First, the metal-ceramic crown was

removed from tooth 11. The secondary caries present on the labial surface, was excavated and restored with composite. Gingivectomy was done to increase the clinical crown length of 11 (Figure 3).

Temporary crown was fabricated with Protem -4 (3M ESPE) and cemented by using non-eugenol temporary cement (GC).Patient was recalled after 2 weeks and it was observed that gingiva in relation to tooth 11 was healed properly. The preparation was modified for all ceramic crown, deep chamfer margin was given and gingival retraction was done before taking the final impression. Final impression was made by using Polyether elastomeric impression material (3M ESPE). Temporary crown was relined with Protem -4 (3M ESPE) and recemented using non-eugenol temporary cement (Figure 4).

Impression was sent to the laboratory for the fabrication of all ceramic crown (Lava). The shade of the tooth was determined with a Vitapan Classic shade guide. After a week, temporary crown was removed and all ceramic crown was cemented with self etch Unicem luting cement (3M ESPE) after doing minor intraoral adjustments. The crown length of tooth 11 was improved and was in an alignment with tooth 21. Final results were satisfactory in relation to esthetics and function and patient was quite satisfied with the appearance (Figure 5).

DISCUSSION

Although porcelain-fused-to-metal (PFM) restorations are the most widely used full-coverage crown restoration systems, their inherent properties make the achievement of natural aesthetic restorations an elusive task. In contrast, the all-ceramic systems offer excellent translucency and vitality, without the opacity associated with PFM restorations. Its vitality is further enhanced by an adhesive resin cementation method that conducts the color of the underlying tooth structure. Among various all ceramic systems, Zirconia was selected for the fabrication of all ceramic crown in the present case. As an opaquer, it has got better properties to mask the discolored tooth. Hefferman et al suggested that zirconia restoration would be better suited to match opaque, high value teeth.12 The new generation adhesive agents combined with highly filled resin luting cements allow to create an integral unit between the restoration and the natural tooth.13 This bond provides high compressive strength and low microleakage. The present case report demonstrated the preparation procedure, the importance of well-integrated provisional restorations, and the accuracy in transferring provisional information onto the final jacket crown. It can be concluded that due to their natural appearance, the all-ceramic materials, especially the glass ceramics, blend harmoniously with the oral environment and are particularly appreciated where aesthetics is a priority, especially in the maxillary anterior region.

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Souce of Support: Nill, **Conflict of Interest:** None declared

Case Report

Flap surgery With Platelet-Rich Plasma and Bioactive Glass-A New Ray of Hope in Aggressive Periodontitis Treatment

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Abstract

Localized aggressive periodontitis is a distinct entity of periodontal disease and is characterized by deep vertical bony defects that typically affect the first molars and incisors of young patients. In the past, a variety of treatment strategies have been suggested and tried with some degree of success in treating aggressive periodontitis. Platelet-rich plasma and bone grafts when used individually have reported fairly good results in terms of periodontal regeneration. Also there is currently great interest concerning the use of platelet-rich plasma (PRP) in combination with bone grafts for predictably obtaining periodontal regeneration. We hereby present a case of localized aggressive periodontitis in a 27 year old female. Clinical and radiographic findings are discussed and treatment plan along with 9 months follow-up is also reported. In this case report, we suggest treatment of localized aggressive periodontitis defect with a combination of growth factor (Platelet rich plasma) and bone graft (Perioglass) which resulted in almost 60-70% bone gain post-surgically.

Therefore, in cases of localized aggressive periodontitis, treatment option of a combination of Platelet rich plasma (PRP-a well known source of growth factors) and bone grafts holds promise and can be considered.

Key words
PRP, Pocket Depth, Bone graft, Perioglass

INTRODUCTION

Periodontal diseases are inflammatory diseases with differing levels of periodontal attachment loss and bone destruction. One of the objectives of periodontal therapy is the morphological and functional regeneration of lost periodontal supporting tissues. Periodontal regeneration requires a sequence of biological events including cell adhesion, migration, proliferation and differentiation [1].

Localized aggressive periodontitis is a distinct entity of periodontal disease and is characterized by deep vertical bony defects that typically affect the first molars and incisors of young patients. Aggressive periodontitis has been defined using the following criteria: 1) age of onset, 2) distribution of lesions, 3) severity of destruction, 4) rate of progression, and 5) response to therapy. A positive family history has also been reported for aggressive periodontitis. Therapy is usually aimed at reducing the pathogenic microflora through scaling and root planing and the administration of systemic antibiotics. However, conservative periodontal therapy may result in reparative wound healing with limited regeneration of the lost tissues. Periodontal surgery combined with platelet-rich plasma and bioactive glass has been introduced as a method to promote regeneration of the lost periodontium and has been studied extensively in the treatment of chronic periodontitis. This case report describes the treatment of a 27-year-old female patient displaying severe localized aggressive periodontitis with documented disease progression. After initial therapy consisting of scaling and root planing and systemic administration of tetracycline, the vertical defects were treated by access flap combined with application of platelet-rich plasma and bioactive glass. Clinical and radiographic findings are reported for up to 9 months after initial therapy, indicating good efficacy of the therapeutic strategy and stability of the treatment outcome.

CASE-HISTORY:

An apparently healthy 27 yr old female patient reported to the Department of Periodontics, D.A.P.M R.V.Dental College-Bangalore with the chief complaint of food lodgement in the upper right back tooth region since 2 years. Occasionally, bleeding occurred while brushing teeth. Patient also gave a family history of her mother losing all her teeth at an early age due to mobility of teeth.

On clinical examination, the oral hygiene status of the patient was found to be good with moderate

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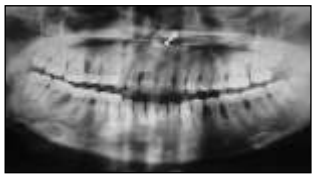
gingivitis (figure 1). Periodontal examination revealed periodontal

pockets in multiple areas with deep pockets (ranging 6-9mm) in first molars (figure 2) in all quadrants and upper central incisors.

Investigations carried out were (i) Routine haematological investigations which were found to be within the normal ranges. (ii) Radiographs- full mouth Intra-oral periapical radiographs and Orthopantomograph(OPG). OPG showed vertical bony defects in 16, 26, 34, 35, 36, 46, and 47 tooth region (figure 3).



(iii) Vitality test was done for 16 tooth which was found to be vital.

Based on the history, clinical and radiographic examinations, and the criteria given by Tonetti and Mombelli et al., a diagnosis of Localized aggressive periodontitis was reached upon.

The treatment plan consisted of-

I. Scaling and root planing.

ii. Systemic administration of tetracycline hydrochloride 250mg four times daily for 14 days.

iii. Patient was recalled 6 weeks after phase-I therapy and at re-evaluation, probing pocket depth was found to be deepest in 16 tooth region with measurement of 7mm. Thereby surgical intervention was deemed necessary and open flap debridement with regeneration using a combination of Platelet rich plasma (PRP) and Bone graft (BG)-Perioglass was planned in relation to 16 tooth region.

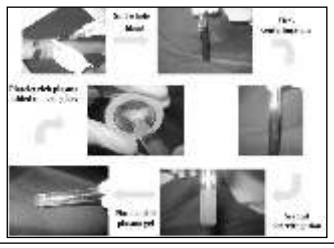
Surgical Procedure consisted of the following steps:

a) Preparation of PRP

b) Open flap debridement and

c) Placement of PRP mixed with Perioglass.

Step-1: Preparation of PRP [8]. (Figure 4)



1. Briefly, 8 ml of blood was drawn by venipuncture of the antecubital vein. Blood was collected in a sterile tube containing an anticoagulant to avoid platelet activation and degranulation.
2. The first centrifugation is called "soft spin", which allows blood separation into three layers, namely bottom-most RBC layer (55% of total volume), topmost acellular plasma layer called PPP (40% of total volume), and an intermediate PRP layer (5% of total volume) called the "buffy coat".
3. Using a sterile syringe, the operator transferred PPP, PRP and some RBCs into another tube without an anticoagulant.
4. This tube underwent a second centrifugation, which was longer and faster than the first, called "hard spin". This allows the platelets (PRP) to settle at the bottom of the tube with a very few RBCs, which explains the red tinge of the final PRP preparation. The acellular plasma, PPP (80% of the volume), is found at the top.
5. Most of the PPP is removed with a syringe and discarded, and the remaining PRP is shaken well and is ready for use.

Pre-procedural rinse with Chlorhexidine

↓

Adequate anaesthesia

↓

Sulcular incisions

↓

Elevation of full thickness flap

↓

Debridement of the area was done using area-specific curettes (Gracey curettes)

6.This PRP is then mixed with Perioglass.

On exposure, a combination defect was found in relation to 16 tooth with 3walled defect apically and 2walled defect coronally (figure 5).

Step-3: PRP was mixed with perioglass and placed in the bony defect (figure 6).

Following placement of the PRP and Perioglass combination, the defect was closed with interrupted sutures and a periodontal dressing

was placed.

Following the surgery, patient was recalled once a month for 9 months. At 9 months recall visit, the probing pocket depth was reduced to 3 mm from a pre-operative measurement of 7 mm in the operated area. (figure 7, 8). Radiographically a defect fill of approximately 60-70% was achieved.

DISCUSSION

The use of polypeptide growth factors (PGFs) to regulate biological events affecting surgical outcome has recently attracted the attention of researchers [1, 2, 3]. Among all PGFs, platelet derived growth factor (PDGF) and transforming growth factor (TGF-α) have been studied most extensively. PDGF and TGF-α have been shown to promote cell growth, differentiation and periodontal regeneration [2, 3, 4]. Platelet derived growth factor (PDGF) and TGF-α are abundant in the alpha granules of platelets [5] and platelets are involved in the wound-healing process and represent a natural source of PGFs [3]. A convenient approach to obtain autologous PDGF and TGF-α is the use of platelet-rich plasma (PRP) that can be easily prepared from patient's own blood by centrifugation [6, 7]. It can be rationalized that by increasing local concentrations of PGFs with the application of PRP, the periodontal healing outcome would be enhanced.

The addition of PRP to bone grafts or guided tissue regeneration (GTR) has been shown to significantly enhance gain in clinical attachment when compared to the control groups of bone grafts, GTR or open flap debridement alone in intra-bony periodontal defects [9–14]. Only in one study including GTR in the control group, the clinical results failed to demonstrate the superiority of the combined approach with PRP. However, the authors found positive effects on the soft and hard tissue healing [15].

Despite the fact that pre-clinical and initial clinical data appear promising, it is not possible to draw definitive conclusions at this time. In this process, trials evaluating the efficacy of PRP in combination with different regenerative materials can still add valuable information for the clinician in decision making regarding effective and predictable treatment alternatives for periodontal regeneration especially in aggressive periodontitis patients which are difficult to manage clinically because of the destructive and progressive disease character seen in young individuals.

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Souce of Support: Nill, **Conflict of Interest:** None declared

Case Report

A CAD-CAM prosthodontic option, for a rotated maxillary right central incisor – An evaluation.

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Abstract

Background
The conjecture literature, regarding the prosthodontics options of the rotated maxillary central incisors is very much lacking. Few CAD-CAM references are listed in relation to occlur prosthesis.
Objective
This article presents a case report of rotated maxillary right central incisor to fabricate prosthesis by using the advantages of a digital photographic approach over to a conventional approach.
Materials and Methods
Non-clinically, the definitive diagnosis and treatment plan was decided by CAD-CAM technique as Zirconia, jacket crown. Clinical procedure included an enameloplasty on left central and right maxillary lateral incisor. Reduction of rotated and crooked incisor was performed, in normal manner.
Results
The Patient felt happy and satisfied with the intermediary two dimensional photographs which were provided by CAD-CAM system. The technique distinguished among the different treatment modalities for aesthetics .and to relieve the emotional problems which were faced by female patient.
Conclusion
Digital imaging provides an immediate treatment option for the patients. Soft ware also provides an interim aid, for the clinician as well as technician in the form of two dimensional snaps. CAD-CAM entirely helps for a conservative prosthetic option for a rotated central incisor.

Key words
CAD-CAM, Digital imaging, Fix dental prosthesis (FDP), Crooked, Full veneer crown (FVC), Immediate option, and interim option.

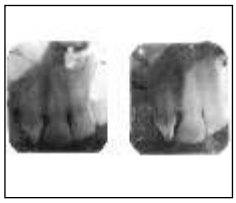
INTRODUCTION

Authors describe a CAD –CAM1 technique, through the use of advantage of digital photography2 which was based on clinical report. Photographic records aid in identifying esthetics, disharmony and planning for esthetics correction and establishing mutually compatible expectations of dentist and the patient.2 Author consulted text book of Fradeani M3, on esthetic rehabilitation in fixed prosthodontic and esthetic analysis to prosthetic treatment .The case report will cover a patient case report, materials and methods, and final result of the technique for a rotated maxillary right central incisor tooth.

MATERIALS AND METHODS

Case report; A 40 years old female patient visited to the deptt. Of Prosthodontics, kothiwal dental college, Moradabad, about three 3 years back. The chief complaint of the patient was mal-aligned right sided maxillary central incisor. She was a professional lady, working as a vice-principal. Examination: extra oral – face profile was convex and intra oral-she had excellent oral health. Her teeth did not have any cavity and periodontal disease. The angle's class-1 normal occlusion was observed. She also had normal vertical & horizontal overlap. Anterior view showed a right sided mal-aligned (crooked) central incisor (Fig.-1).

On Medical examination nothing abnormal was detected. Radiographic examination: A, the IOPA- X Rays disclosed nothing. Bone loss was noticed negligible. Pulpal condition was normal. B, Orthopantogram -NAD (Fig.-2).



Materials and methods were categorized into non-clinical & clinical. Non clinically, An inter disciplinary approach4, 5, 6 was considered in the form of an orthodontic treatment option, the

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extraction of crooked incisor, the F P D, R P D, implant, a jacket crown, or the laminate. Authors advocated Computer Assisted Design and Computer Assisted Machining (CAD-CAM) technique for definitive diagnosis and treatment plan as; Non- clinically, Diagnostic casts were made. These casts were mounted on semi- adjustable articulator with centric relation and face bow record transfer. A digital photograph was processed by using a digital camera, having following specifications. Cyber shot DSC-w.30, Sony Japan; 6-mega pixel: sensitivity ISO-1000 (Fig.-3).

The digital photograph along with dental stone cast was evaluated for a prosthesis. The format and image of the question tooth was adjusted for the space by the application of computer graphic software (CGS) i.e. Photoshop 7.00 adobe system inc. sanjose California .2 It was performed by regaining the space of 2 m.m. from left central incisor and was 1 m.m. from right lateral incisor. An Adjusted final image photograph was obtained from HP2 1315 inkjet printer (Fig.- 4). The resultant two dimensional photographs were shown to the patient for the evaluation of gingival zenith level and future jacket crown (Fig.-4)

Clinical procedure; an enameloplasty on left maxillary central incisor and right maxillary lateral incisor was accomplished according to above mentioned dimensions. Reduction of rotated incisor was also performed. Crooked central incisor was reduced in normal manner. A completely reverted7, 8, 9 form of reduced crown was created (Fig.- 5).

Soft tissue management was carried from double gingival cord procedure9. Final impression was recorded with additional silicon rubber base impression material in custom made special tray. Provisional restoration of self cure acrylic, poly methyl methacrylate was fabricated and cemented with zinc oxide eugenol cement for three weeks. Full veneer crown (FVC) of Zirconia8 via CAD-CAM was fabricated. Finally, it was cemented (Fig.- 6).

RESULT

Digital imaging got the advantage of acceptable and deserving natural esthetic treatment modality through two dimensional photographs. These photographs acted like a mediator as immediate treatment option for the patient and an interim aids for clinician and technician as well. This method also changed the treatment option from implant surgery to FDP as an all ceramic crown. Patient was much satisfied and was asymptomatic when reviewed recently.

DISCUSSION

There is no consequence literature available for references regarding the present case. Authors considered that etiologic factors of rotated central incisor could be the injury of child hood in the pre-maxillary region. The Injury displaced and misaligned the developing tooth bud. Adjacent developing teeth buds also misalign the effected tooth. The mid line was slightly shifted; however, Canine position was normal. Because of the shorter space occupied by maxillary arch was adjusted by crowding of mandibular anterior.

Quality has many expressions but indeed targeting perfection is its own reward. Space was occupied by rotated central incisor which was very much less and therefore it gave a distorted gingival zenith position. It affected the future treatment plan options. The main problem was distorted space which was the cause that orthodontic treatment could not be possible (Fig.-1). Implant treatment is not a realistic option. Enameloplasty was done to regain the space for prosthesis. System helps to restore partially mutilated smile and confidence of the patient. However, a special digital photography equipment and computer software system is required. Zirconia, all ceramic jacket crown is the best option amongst the present modalities for anterior prosthesis 8. The final restoration was cemented after three weeks to restore the gingival margin health.

SUMMARY

Present technique could be a wining aid for the diagnosis and treatment options of the discoloured, mutilated, and mal-aligned anterior teeth. Present case report is rare one. Authors, advocated technique can be valuable for the patient and clinician to reduce the psychological questions. Other application of current CAD - CAM technique may be in wider diastema and distorted edentulous spaces as over to an alternative diagnostic teeth set up. It will present a better image to the patient. Consequently, used CAD -CAM may be suggested as an alternative option procedure in the clinics. It absolutely helps to decide the future treatment plan option for a prosthesis.

ACKNOWLEDGEMENTS

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Souce of Support: Nill, **Conflict of Interest:** None declared

Case Report

"AESTHETIC REPLACEMENT OF MAXILLARY ANTERIOR TEETH"

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Abstract

Like all things modern, aesthetic dentistry evolves to remain in step with the times. Methods, materials, and expectations each play a part in that evolutions, changing over time to best suit the practice of dentistry. One thing, however, has remained true throughout the history of aesthetic dentistry: success depends as much on the restoration of function as it does on the restoration of appearance and form. A beautiful restoration that fails is like painting your house with watercolors: once that first rainstorm blows through, the beauty is lost, and you are left with a bigger problem than you had before. In this case report an attempt was made not only to rehabilitate destroyed tooth structure of oral cavity but also to rejuvenate facial aesthetics and smile.

Key words
All-Ceramics, Esthetics Crowns, fibre post

INTRODUCTION

As rightly said, "BEAUTY LIES IN THE EYES OF THE BEHOLDER"An acceptable cosmetic effect in any dental restoration has always been regarded as important to good dentistry. A well-made prosthesis will fail if it is deficient in this respect.Aesthetics includes the appreciation and response to the beautiful in art and nature. Aesthetics has been given many definitions in dentistry but according to Young. "It is apparent that beauty, harmony, naturalness and individuality are major qualities" of aesthetics. The dentist must visualize aesthetics in relation to the patient and then translate that visualization into an acceptable aesthetic result. The success of his efforts depends upon his artistic ability, his powers of observation and his experience.

•Modern dentistry aims at conservation of remaining tooth structure. Recently dental researchers have attempted to incorporate fiber reinforcement technology into dental laboratory procedures and to add fibers to dental resins. Restoration of a root canal-treated tooth because of a significant loss of structure is achieved with a post and a core. New, prefabricated posts have been introduced for post-and-core endodontic restorations. They are manufactured from special fibers reinforced with ceramic and composite. The main advantage of this new biocompatible metal-free post is that it enables reconstruction of the destroyed tooth structure to its natural aesthetics. The objective of this case report is to describe the Prostho-endo procedures for post-and-core system preparation using a fiber-reinforced post and metal-free crowns over it which is depicted by fine clinical skills.

CASE REPORT:

A 35 year old patient reported in Department of Prosthodontics, Dasmesh Institute of Research and Dental Sciences , Faridkot , Punjab with Anterior teeth restored with faulty Prosthesis (Acrylic Bridge). Intra oral examination revealed maxillary incisors restored with a prosthesis which was not acceptable aesthetically(Fig-1,2).

She had not smiled all these years because of faulty discolored artificial looking acrylic bridge on her teeth.Keeping patients need in mind the treatment plan for the patient involved fiber post and core fabrication followed by all ceramic crowns [IPS e-max] cementation with 12,11,21,22.

Two-thirds of the total canal length was used for the post hole. A reamer of low-speed hand piece was applied along the entire length. A proper-sized Fiber Post was selected according to canal thickness and then cut at the required length. The post was adjusted into the canal. The preferred adhesive technique is dual-cure resin cementation [Calibra Esthetic Resin Cement, Dentsply] of the post and the composite core construction because of the similarity of the physical properties of metal-free posts and ceramic composite cores to those of dentin. The working field was

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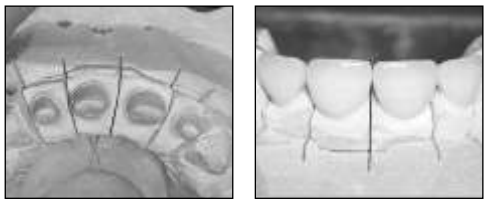
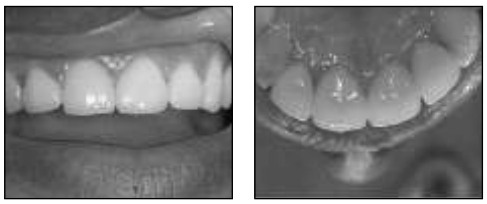
isolated. The root canal surface was etched with 37% phosphoric acid solution for 15 seconds, rinsed thoroughly, and dried with paper points. Equal parts of dual-curing, Hydrophilic Bond and Activator were mixed and applied into the root canal with an endodontic instrument. A thin, uniform coat of bonding resin was applied over the post. Equal parts of translucent [allows maximum light transmission] shade, Base paste and Catalyst of the dual-cure resin cement were mixed and was spread on the surface of the fiber post and then into the post preparation with lentulo spiral. Each post was cemented separately one by one. The post was carefully seated immediately, a 10 second light exposure "pre-cure" of excess cement was done and the "gel" cement was removed with the help of blunt instrument. The post was stabilized for approximately 6 minutes from the beginning of the mixing for the self cure to set. Once the posts were stabilized, all the accessible areas of the post for 20 seconds each, were light cured with visible light curing unit (470nm) (Fig-3). Additionally the gaps between the core and the tooth structure were filled with a core build-up material. (Fig-4)

The tooth restored with a post-and-core system was then prepared for the planned all-ceramic restoration. .The color of the definitive restorations was already defined. After the core was built up and teeth preparations, gingival retraction was done with #00 size [Ultra Dent Product, Utah, USA] ; impression was made with polyvinyl siloxane [Aquasil , Dentsply Caulk]. Provisional restoration was fabricated and luted using eugenol-free zinc oxide cement [Rely X Temp NE, 3M ESPE]. All ceramic crowns were fabricated in the laboratory [IPS e.max [Ivoclar/ Vivadent] (Fig-5,6)



Once the marginal integrity , fit, occlusion and esthetics were verified . The internal surface of the all-ceramic restoration was etched with buffered hydrofluoric acid, washed and dried. Then Calibra Saline coupling agent was applied to the etched clean internal surface for30 seconds and rinsed thoroughly for 20 seconds. Air dried with dental air syringe.

The cores built up surfaces were etched with 37% phosphoric acid solution for 15 s, rinsed thoroughly. Equal parts of dual-curing, Hydrophilic Bond and Activator were mixed and applied into the core surfaces. A thin, uniform coat of bonding resin was applied onto the internal surface of crowns. Equal parts of selected shade Base paste and Catalyst of the dual-cure resin cement [Calibra esthetic resin cement, Dentsply] were mixed and then layered uniformly onto the internal surface of crowns. The crowns were seated one by one with gradual and rocking motion gentle pressure to ensure optimal seating. A 10 second light exposure "pre-cure" of excess cement was done and the "gel" cement was removed with the help of blunt instrument. Then light cured for 20 seconds each from the buccal, lingual and interproximal aspects. The occlusion was checked and a final polish was achieved. Patient was instructed to continue with the oral hygiene regime. (Fig.7a,7b).



Pre operative and post operative photographs reveal marked improvement in aesthetics of patient (Fig.8, 9).

DISCUSSION

David F. Levine stated that improper management of the periodontal tissues during restorative procedures is a common, but often overlooked, cause of failure. When a restoration is placed, the preservation of an intact, healthy periodontium is necessary to maintain the tooth or teeth being restored. Predictable long-term restorative success requires a combination of restorative principles with the correct management of the periodontal tissues2.

Clinical observation reveals a series of advantages for the metal-free restorations. This technique is easy to perform and safe for both patient and dentist and are highly aesthetic. Cast posts and cores are commonly used because of their superior mechanical properties. However, if a ceramic crown is chosen as the final restoration, the color and opacity of the post may lead to discoloration and shadowing on the gingival and cervical areas of the tooth. A cast post can cause early root fracture due to the excessive tooth structure removal and direct transmission of masticatory loading forces from the post on the tooth root. There may be as high as a 100% incidence of root fracture in teeth restored with a cast post and core3. The rate of root fracture for teeth restored with a post and core is 50% for stainless-steel posts and 0% for the carbon fiber post (C-Post) group4. To solve this esthetic problem, tooth colored fiber post systems were introduced; these are capable of resisting occlusal loads and have light transmission characteristics similar to those of natural teeth.5

The union of the luting composite cement of the metal-free post and dentin yields a stable and homogeneous, newly created structure whose aesthetics and durability is remarkable. The fiber-reinforced post-and-core system together with adhesive cementation procedure is easy and safe to use in clinical practice. It ensures high-quality aesthetics and the durability of the metal-free restorations.

CONCLUSION

According to the obtained results by this prostho-endo endeavor it can be very well appreciated that comprehensive treatment approach requires multidisciplinary team work for successful rehabilitation leading to conservation of the tooth and its permanent restoration with excellent aesthetic. In this case report an attempt was made not only to rehabilitate destroyed tooth structure of oral cavity but also to rejuvenate facial aesthetics and smile which provides confidence, solace and comfort to the patient.

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Souce of Support: Nill, **Conflict of Interest:** None declared

Case Report

Bleaching Effectiveness of 35 % Carbamide peroxide And Superoxol in Fluorosis – Case Study

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Summary

AIM - In Office Bleaching with either superoxol or 35 % carbamide peroxide offers rapid colour resolution within limited time period. Two cases with brownish discoloration due to fluorosis in maxillary anterior teeth were treated with superoxol and 35% carbamide peroxide respectively to compare their bleaching effectiveness .Method- Six maxillary anterior teeth comprising of Central Incisors, Lateral Insiors and Canines were bleached in two patients with fluorosis. In the first patient teeth were bleached with 35% Carbamide peroxide and in the second patient with Superoxol. Both the patients were given three bleaching treatment sittings at an interval of one week in between each sitting.For evaluation of colour change, photographs under standardized condition were taken before starting the bleaching treatment and after each treatment sitting. Colour change was evaluated by a dissociated, impartial person on the basis of the photograph. RESULT - The colour lighting obtained with 35% Carbamide peroxide was greater then superoxol. CONCLUSION - The Bleaching effectiveness of 35% carbamide peroxide gel is greater than superoxol in cases of fluorosis.

Key words
Bleaching 35%, Carbamide peroxide, Superoxol, Fluorosis

INTRODUCTION

The combined effects of intrinsic and extrinsic colour determine the appearance of teeth. Injury, antibiotic use, fluoride ingestion and aging can all cause intrinsic discolouration .[1,2] Extrinsic discolouration is produced by staining on the tooth surface and salivary pellicle that forms on the enamel. These stains can be removed by mechanical action and controlled to some degree with toothpaste abrasives. [3,4]

Ingestion of high concentration of fluoride during tooth development causes fluorosis, in which affected teeth are discoloured ranging from opacity to dark brown colour with either smooth surface or pitting. Esthetics in such cases is one of the primary reasons for seeking dental treatment. Out of the various treatment modalities available, tooth bleaching is an effective treatment for such cases. In-office tooth bleaching carried out with either superoxol or 35% carbamide peroxide offers the advantage of rapid colour resolution within limited period as compared to at-home bleaching.

In the present study, two cases having brownish discolouration in the maxillary anterior teeth due to fluorosis were taken up for bleaching. The first patient was treated with superoxol (30% hydrogen peroxide). The second patient was treated with 35% carbamide peroxide (Opalescence Quick).

MATERIALS AND METHOD

In this study two commercially available bleaching agents Opalescence Quick (Ultradent Product Inc, USA) and Superoxol (SD Fine Chemicals, India) were used.

In both the patients, maxillary anterior teeth, comprising of central incisors, lateral incisors and canines were bleached. Oral prophylaxis was first carried out in both the patients.

In the first patient, a 22 year old female, bleaching was carried out with 35% Carbamide peroxide. Impression of the maxillary arch was made using alginate impression material. Cast was poured with dental stone. Bleaching tray was fabricated on the cast using vaccum forming machine, after placing 0.5 mm thick spacer,0.5 mm away on the labial surfaces of all the six maxillary anterior teeth,0.5mm away from the gingival margin. The tray was trimmed and tried in the patient's mouth. Before the bleaching treatment, carbamide peroxide gel was activated by passing the syringe, containing the gel in running hot water for 1 minute. The gel was placed in the tray and the tray was seated in the patient's mouth. Excess, extruded gel, if any, was wiped off with cotton gauze and Vaseline was placed on the adjacent gingival tissue and lips. The tray was kept in mouth for 30 minutes after which it was removed and teeth wiped off for bleaching gel.

In the second patient, a 20 year old female, bleaching was carried out with Superoxol (30% hydrogen peroxide). Six maxillary anterior teeth were isolated with rubber dam. Cotton swabs of the same size as the labial surface of the teeth saturated with superoxol

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were placed on the labial surfaces of all the six teeth. Heat was applied to these swabs with a spatula after heating on a spirit lamp, so as to activate the hydrogen peroxide solution. After every 10 minutes, Superoxol was replenished to the cotton swabs and reactivated by heat application with a spatula. In this manner the patient was treated for 30 minutes after which the rubber dam was removed.

Both the patients, were given 3 bleaching treatment sittings, at an interval of 1 week in between each sitting.

For evaluation of the colour changes, photographs under standardized conditions were taken before starting the bleaching treatment and after each sitting. The photographs were taken with a Cosina C1 C s/a SLR 35 mm camera, using 35-70 mm, 1:3.5-4.8 zoom lens, to which close up filter of +2 diopter was fitted. Photographs were taken at a film speed of 100 with shutter speed of 1/125 aperture. Value of F/11, focussing ring set at Macro 1.5X from a distance of 1 ½ feet under the same lighting condition i.e. using the same flashlight of Hanimax X140 grade. Fuji ISO 100 film was used for photographs. All the photographs were taken in the same film. The film was developed and printed at Kodak Colour Laboratory.

Evaluation of the colour change was carried out by a dissociated, impartial person on the basis of the photographs giving a grade of either 0 or 1, where 0 indicated No colour change,while 1 indicated significant colour change. Photograph taken after each bleaching treatment sitting was compared with the previous sitting photograph for colour change and graded.

RESULT

In the first patient, treated with 35% Carbamide Peroxide, the colour change scored after the first sitting was 1, second sitting was 1,and at the end of third sitting 1.

In the second patient, treated with Superoxol, the colour change scored after the first sitting was 0, second sitting was 0 and at the end of third sitting was 0.

The colour lightning obtained with 35% Carbamide Peroxide was greater than Superoxol.

DISCUSSION

Bleaching is a long recognized, effective method of restoring normal tooth colour by removing the stains that cause discolouration. Bleaching occurs by oxidation or reduction of the pigments. Whitman et al(5) found Superoxol to be an effective, In-Office bleaching agent. S Chandra and Chawla(6) in a Clinical study found Superoxol to be an effective bleaching agent for fluorosed teeth. O Wellet et al(7), Haywood et al(8,9) Heyman et al(10) in separate studies have found Carbamide peroxide to be an effective bleaching agent. Therefore, for treatment of these two cases, Superoxol (30% hydrogen peroxide) and 35% Carbamide Peroxide were chosen.

Superoxol is 35% hydrogen peroxide by weight and 100% by volume in distilled water. The hydrogen peroxide molecule breaks up and forms oxygen and peridoxyl free radical that fractures the macro-molecular pigments and decolourizes the stain. The resulting molecular products are removed by diffusion. Arwill et al used Na to demonstrate increased enamel permeability after 30% hydrogen peroxide treatment.(11) Crin demonstrated that the peroxide containing bleaching agents could penetrate into the pulp.(12) A certain degree of penetration into enamel and dentin is needed when intrinsic stains have to be removed.

Opalescence quick (35% Carbamide peroxide) is a clear, heavy viscosity, sticky, 35% Carbamide peroxide gel having a pH of 6. Carbamide peroxide gel contains carbopol and urea along with carbamide peroxide, which dissociates into the constituents when it comes into contact with tissue or saliva.(13) Thus carbopol ensures that carbamide peroxide stays active longer in the gel than in a solution. Arendes et al(14) studied the effects of urea on human enamel using SEM, they found that urea was capable of penetrating into the enamel and affecting not only the surface but the interprimate regions of enamel, thus urea penetration can contribute to the permeability of enamel by peroxide and also to structural changes of enamel. Goldberg et al(15) showed that urea attack was mainly interprismatic. Urea is capable of attacking protein structures (by dissociating H-bonds between Co and NH groups). Thus it denatures protein and causes conformational changes. Structural alterations may occur in enamel proteins such as enamelin and amelogenin, thus urea increases the permeability of enamel to peroxides and free radicals. For the same reasons the bleaching effectiveness of 35% Carbamide peroxide gel was found to be more than Superoxol (30% Hydrogen Peroxide) in this study.

1)FIRST PATIENT—BLEACHED WITH 35% CARBAMIDE PEROXIDE


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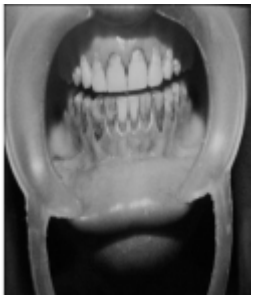
2)SECOND PATIENT—BLEACHED WITH SUPEROXOL (30% HYDROGEN PEROXIDE)

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Souce of Support: Nill, **Conflict of Interest:** None declared

Case Report

ORAL PYOGENIC GRANULOMA

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Abstract

Pyogenic granuloma or granuloma pyogenicum is a well-known oral lesion. The name pyogenic granuloma is a misnomer since the condition is not associated with pus and does not represent a granuloma histologically. We present a case of pyogenic granuloma in a 34 year old female which presented as a single, irregular, reddish, pedunculated 2x2 cms gingival swelling on lingual side w.r.t 47,48.

Key words
Pyogenic Granuloma, Gingiva and Oral Cavity.

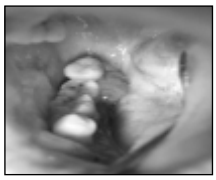
INTRODUCTION

Soft tissue enlargements of the oral cavity often present a diagnostic challenge because a diverse group of pathologic processes can produce such lesions. An enlargement may represent a variation of normal anatomic structures, inflammation, cysts, developmental anomalies and neoplasm. Within these lesions is a group of reactive hyperplasias, which develop in response to a chronic, recurring tissue injury that stimulates an exuberant or excessive tissue repair response. Pyogenic granuloma is of the most common entities responsible for causing soft tissue enlargements.

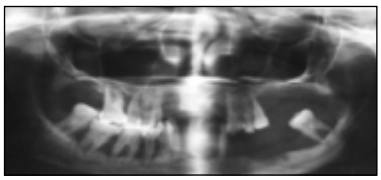
Occurrence of pyogenic granuloma in man was first described in 1897 by Poncet and Dor. At that time, it was called botryomycosis hominis. Pyogenic granuloma has been referred to by a variety of other names such as granuloma pediculatum benignum, benign vascular tumor, pregnancy tumor, vascular epulis, Crocker and Hartzell's disease. It was given its present name by Crocker in 1903(1). However some researchers believe that Hartzell in 1904 introduced the term "pyogenic granuloma" which is widely used in literature, although, it does not express accurately the clinical or histopathologic features. Angelopoulos AP proposed the term "hemangiomatous granuloma" which accurately expresses the histopathologic picture (hemangioma like) and the inflammatory nature (granuloma) of oral pyogenic granuloma(2). Cawson RA et al. suggested that since the blood vessels are so numerous in oral pyogenic granuloma, alternative term for pyogenic granuloma is granuloma telangiectacticum (3).

CASE REPORT

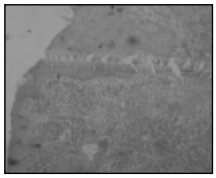
A 34 year old female presented with presented with a single, irregular, reddish, pedunculated 2x2 cms gingival swelling on lingual side w.r.t 47,48 (Fig.1).



Associated teeth were mobile and moderately afflicted by plaque & calculus deposits. Family history was not significant. Medical history was non contributory. Radiographic examination showed generalized bone loss (Fig.2).



Provisional diagnosis was peripheral giant cell granuloma. Differential diagnosis was peripheral ossifying fibroma, carcinoma of alveolus and pyogenic granuloma. Biopsy was performed for the same. Microscopically, the lesion consisted of loose and highly vascular connective tissue with budding endothelial capillaries. Dense chronic inflammatory cell infiltrate was also seen within connective tissue. Overlying epithelium was hyperplastic in some areas and ulcerated in some areas (Fig.3). A final diagnosis of oral pyogenic granuloma was given.



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DISCUSSION

Esmeili T et al. in their review stated that hyperplastic reactive lesions represent as a group the most common oral lesions, excluding caries, periodontal and periapical inflammatory disease. In this group, the second most common group is represented by hyperplastic reactive gingival/alveolar lesions, including inflammatory gingival hyperplasia, oral pyogenic granuloma, peripheral giant cell lesion and peripheral cemento-ossifying fibroma (4). Peralles PG et al. in their clinicopathologic study conducted on gingival and alveolar hyperplastic reactive lesions observed that inflammatory gingival hyperplasia and oral pyogenic granuloma were the most common diagnosis(5). In an analysis of 244 cases of gingival lesions in south Indian population, Shamim T et al. found that non neoplastic lesions accounted for 75.5% of cases with oral pyogenic granuloma being most frequent lesion, accounting for 52.71% cases(6).

Some authors regard pyogenic granuloma as an "INFECTIOUS" entity. Kerr DA has reported staphylococci & botryomycosis, foreign bodies, and localization of infection in walls of blood vessel as contributing factors in the development of the lesion(7). According to Shafer et al. oral pyogenic granuloma arises as a result of infection by either staphylococci or streptococci, partially because it was shown that these microorganisms could produce colonies with fungus like characteristics(8). Some investigators consider pyogenic granuloma as a "REACTIVE" or "REPARATIVE" tumor process(9). Regezi JA etal suggest that pyogenic granuloma represents an exuberant connective tissue proliferation to a known stimulus or injury like calculus or foreign material within the gingival crevice (10). Kelley AP and Bernard AC regard pyogenic granuloma as a "BENIGN, ACQUIRED, VASCULAR, NEOPLASM"(11).

Bhaskar SN, Jacoway JR in their analysis of 242 cases with 133 female and 109 male patients of pyogenic granuloma found that females are slightly more affected than males. In their review of literature of 258 cases found that gingiva was the predominant site followed by lips, tongue, buccal mucosa and hard palate(1). Radiographic findings are absent in pyogenic granuloma. Angelopoulos AP in his review observed that localized alveolar bone resorption in rare instances of large and long standing gingival tumors can be seen (2). Bhaskar SN, Jacoway JR observed in their study that pyogenic granuloma is partly or completely covered by parakeratotic or non-keratinised stratified squamous epithelium. Major bulk of the lesion is formed by a lobulated or a non lobulated mass of angiomatous tissue. Usually, lobulated lesions are composed of solid endothelial proliferation or proliferation of capillary sized blood vessels. The amount of collagen in the connective tissue of pyogenic granuloma is usually sparse. Surface can be ulcerated and in such ulcerated lesions, edema was a prominent feature and the lesion is infiltrated by plasma cells, lymphocytes and neutrophils. Isolated giant cells were seen in 3 lesions (1). Surgical excision is the treatment of choice. After surgical excision of gingival lesions, curettage of underlying tissue is recommended. Bhaskar SN, Jacoway JR has reported one recurrence after conservative excision with a recurrence rate of 15.8%. They also stated that pyogenic granuloma lacks infiltrative or malignant potential (1).

CONCLUSION

A pyogenic granuloma is an exuberant growth of granulation tissue secondary to irritation. Intraorally, it can present with a wide array of clinical appearances, ranging from a sessile lesion to an elevated mass. They are usually more common in females, and often found on the keratinized tissue. Hence, pyogenic granuloma should always be kept in mind as a differential for reddish lesions affecting oral cavity.

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Souce of Support: Nill, **Conflict of Interest:** None declared

Case Report

COMPARISON OF TWO APPROACHES FOR THE TREATMENT OF ANTERIOR CROSS BITE

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Abstract

Anterior crossbite is the term used to describe an abnormal labiolingual relationship between one or more maxillary and mandibular incisor teeth. Different techniques have been used to correct anterior crossbites. This paper describes the comparison between two methods for correction of single tooth anterior crossbite namely the lower inclined plane and a Hawley's appliance with double cantilever spring with posterior bite plane. Though correction was achieved with both the methods but it was observed that the results were much faster with the lower inclined plane. This procedure is a simple and effective method for treating anterior dental crossbite

Key words
Anterior cross bite, Catalan's appliance, Tongue Blade Therapy.

INTRODUCTION

Moyers defines a simple anterior tooth crossbite as a dental malocclusion resulting from the abnormal axial inclination of one or more maxillary teeth [1]

The clinician should determine whether the crossbite is skeletal or dental in origin from the profile analysis and intra oral findings[2]

Dental -type anterior crossbites usually exist in those patients where :

1. The molars and cuspids are in Class 1 relationship.
2. The crossbite involves only one or two teeth.
3. The profile of the patient is generally normal and the same when the mandible is at rest.
4. The teeth are occluded and the tooth or teeth are involved in the crossbite exhibit only an abnormal lingual axial inclination usually in the presence of a causative factor. [3]

Anterior crossbite should be intercepted and treated at an early stage so as to prevent a minor orthodontic problem from progressing into major dento-facial anomaly. An old orthodontic maxim states "the best time to treat a crossbite is the first time it is seen."[4]

Anterior crossbite is the result of variety of conditions, including the following:-

1. A labially positioned supernumerary tooth may cause torsiversion and lingual deflection of an incisor.
2. Trauma to an anterior primary tooth may cause displacement of the developing permanent successor and eruption in crossbite.
3. An arch-length deficiency can cause a lingual deflection of permanent anterior teeth during eruption [5]

As the treatment is carried out with removable appliances good co-operation between the specialist and the patient is one of the most important conditions for successful treatment results.

In the following article, two cases of anterior crossbite were treated with different treatment approaches i.e. one case was treated with tongue blade therapy followed by Catalan's appliance and the second case was treated with Hawley's appliance with Z-spring and posterior bite plane and comparison was made to see for faster results and better patient compliance.

CASE REPORT

Both the cases reported here were in the early mixed dentition period and had Class-1 molar and canine relationship. In both cases there was sufficient mesiodistal distance to achieve labial movement of maxillary tooth.

Case-1

A 9 year old patient reported to the department of Pedodontics with the chief complaint of "crooked teeth". Examination revealed the normal profile of the patient, the same whether the mandible was at rest or when the teeth were occluded. The medical and dental histories were non-contributory. Intraoral examination showed that the maxillary permanent central incisors were erupted but the right central incisor i.e. maxillary right central incisor had deflected lingually. The diagnosis in this case was a single tooth dental type anterior crossbite.

Initially in this case tongue blade therapy was given. The patient was instructed to insert the tongue blade at an angle between the teeth and he was asked to bite firmly for five seconds followed by rest. This is repeated for 25 times for three times a day. But the patient reported after four days with no change. So an inclined plane was constructed which was made of acrylic, it produced a forward sliding motion of the maxillary incisors on closure. In this case, anterior crossbite correction was seen within seven days itself. No post- operative sensitivity or pain was

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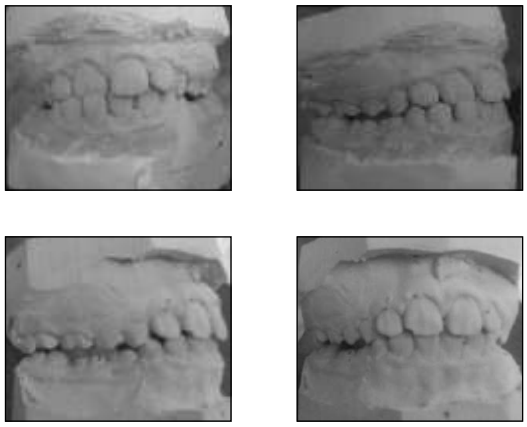
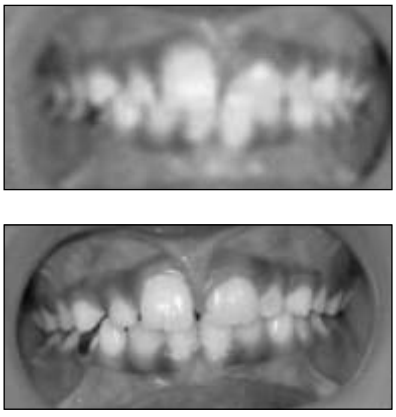
reported by the patient. But the patient was advised soft diet for one week to prevent inflammation of the surrounding periodontal structures.



Case
-2
Another 9 year old patient reported to the Department of Pedodontics with the chief complaint of unesthetic appearance. The medical and dental histories were non-contributory. Extra oral examination revealed normal profile of the patient. Intraorally, it was observed that the maxillary left permanent central incisor was lingually locked.

In this particular case, a Hawley's appliance with a double cantilever spring was given on maxillary left permanent central incisor with the posterior bite plane. Since it was a deep over bite the spring was given along with a posterior bite plane to help in jumping the bite. In this case Z- spring was indicated as there was adequate space for the labialization of the maxillary central incisor. The patient was recalled after one week and the double cantilever spring was activated and the desired results were seen with in four weeks. The patient's compliance was good and the patient did not complain of any pain or inflammation.

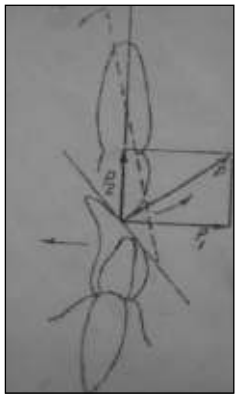


DISCUSSION

Crossbite is one of the problem that is recommended to be corrected as soon as possible because an uncorrected crossbite can lead to undesirable growth modification thus resulting in true asymmetry of the face. The period of mixed dentition offers the greatest opportunity for occlusal guidance and interception of malocclusion. If delayed to a later stage of maturity, treatment may become more complicated.

Selection of appliance for correction of the crossbite is critical for successful treatment. The appliances used for single tooth dental anterior crossbite are :-
1. Tongue blade therapy
2. Reverse stainless steel crown
3. Fixed or removable mandibular acrylic inclined bite plane. [7]
4. Hawley's appliance with Z- spring.

The tongue blade is an effective method of treatment during the early phase of eruption, however, it requires total co-operation from the patient, which could not be achieved in our case. The reverse stainless steel crown is a well known method. The chief disadvantage of this method is the difficulty in adapting a preformed crown to fit the tooth in crossbite. Further more, the reverse stainless steel crown is an unesthetic treatment that is often rejected by the children and their relatives. [8]
Because of the disadvantages of the methods mentioned above, a cemented acrylic bite plane was given in Case 1. The lower inclined plane caps the lower incisors and is inclined at about 450 to the occlusal plane. On closing the upper incisors, which formerly occlude behind the lower incisors , bite on the inclined plane and the pressure of the bite (P) divides into two force vectors P1 and P2(Figure 1). The pressure (P1) proclines the upper incisors. The Pressure (P2) intrudes the incisors. The steeper the plane the greater the forward pressure on the maxillary incisors. The advisable angle is 45° [p]



So, desirable results in Case 1 were seen within seven days itself with good patient compliance.
In Case 2, since there was sufficient space for the maxillary central incisor to move labially, a Hawley's appliance with a double cantilever spring was given. A maxillary posterior bite plate was inserted to allow clearance for the crossbite correction. [10] Though the patient's compliance was good, the desired results were seen within 4 weeks.

CONCLUSION

It is important to state that early correction of anterior crossbite may facilitate the eruption of canines and premolars in Class 1, eliminates traumatic occlusion of incisors, providing a normal environment for growth of maxilla and can often improve the self esteem of child. [11]
In the following cases, since both the cases showed dental anterior single tooth crossbite, a comparison was made between two methods namely the inclined plane and the Hawley's type appliance and it was observed that the results from anterior inclined plane were much faster provided the patient's compliances is good.

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Case Report

PROSTHODONTIC REHABILITATION OF PATIENT WITH OCULAR DEFECT USING A GRAPH GRID

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Abstract

The eye is a vital organ not only in terms of vision but also being an important component of facial expression. Loss of eye has a crippling effect on the psychology of the patient. Treatment of such cases includes implants and acrylic eye prosthesis. Although implant eye prosthesis has superior outcome, due to economic factors it may not be advisable in all patients. So a custom-made ocular prosthesis is a good alternative. A case of a custom-made ocular acrylic prosthesis is presented here, which had acceptable fit, retention and esthetics.

Key words
Ocular Defect, Custom Made Occular Prosthesis, Graph Grid

INTRODUCTION

Eyes are generally the first features of face to be noticed. Removal of this organ either due to tumors, trauma or any other condition not only cause unaesthetic look but also there is loss of function and has a psychological effect on the patient. Thus, ocular prosthesis should be provided as soon as possible for the psychological well being of the patient. A congenital anomaly or pathology may necessitate an orbital evisceration or an orbital enucleation. The surgical procedure of evisceration is where the contents of the globe are removed, leaving the sclera intact. A more invasive procedure is enucleation where the entire eyeball is severed from the muscles and optic nerve. Exenteration, the most radical, involves removal of the contents of the orbit.

CASE REPORT

A 55-year-old male was referred to Department of Prosthetic Dentistry from the Ophthalmology Department. On history it was found that the patient was suffering from malignant melanoma of the right eye and the eye had to be enucleated. So surgery was done and the eye was enucleated . On examination of the patient 15 days after the surgery, it was decided that a custom-made ocular prosthesis would be the best to meet the needs of the patient as the extra effort that is put into fabrication of a custom-made prostheses would enhance the esthetics and functional results rather than a stock ocular prosthesis

Evaluation of patient ocular defect

In a case of evisceration the extra ocular muscles are left intact and hence good mobility of the prosthesis is possible. So it becomes mandatory to do the defect evaluations. In according to standard procedure; the palpebral fissure was observed both in open and closed position to rule out any abnormality. Evaluation of the muscular control of the palpebrae and the internal anatomy of the socket in resting position and full excursive movement was performed. Mobility of the posterior wall of the defect was assessed. Condition of conjunctiva, depth of fornices, and presence of cul de sac was noted.

Fig 1: Pre Operative

Materials and Techniques -

Impression and wax pattern fabrication-The impression of the anophthalmic eye socket was sought by introducing an impression material into the eye socket using a disposable syringe and projecting it out between the lids. The impression material used here was irreversible hydrocolloid (ALGINATE).After the impression material was set, the impression was removed and invested in dental gypsum in order to obtain a positive cast of the eye socket. Subsequently the gypsum cast was coated with a separating medium and white paraffin wax was then shaped in an empirical approximation of the anterior curves of the investment form.

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Fig 2
Impression Of Defect

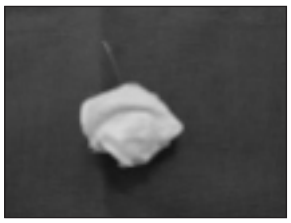


Fig 3
Internal Surface Of Defect

Trying the scleral wax pattern

Wax was added or trimmed from the basic sclera pattern until satisfactory contours of the eyelids were achieved in open and closed positions .

Technique of Iris Disc Placement

1 Transparent graph grid was used to attach iris disc.
2 Certain guidelines were marked on patients face.
3 The facial markings were transferred to grid by placing it on patients' face in place

Fig 4 And 5 : Try In Of Sclera Wax Pattern

Transparent Graph Grid

Markings were made on grid template on X-axis from A to H starting from midline and on left side from A' to H'. Similarly from 1 to 7 on Y-axis and 1' to 7' on left side. The distance between each marking was 1cm on both X and Y axes.

Guidelines on Patients Face

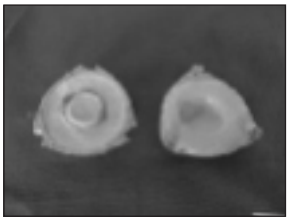
A vertical midline was marked passing through the forehead crease, glabella, tip of the nose and chin. The distance from the right eye medial canthus to the midline and left eye medial canthus to the midline was measured. This distance standardized the midline marking and was used to reposition the grid template each time during the try-in visit.

Evaluation with Grid Placed

The patient was asked to gaze straight at an object kept 4 feet away .The operator then marked the vertical lines coinciding with the with the medial and distal extremities of the iris of the natural eye. Similarly the horizontal lines referring to the centre, inferior and superior limits of the iris were marked. The facial markings were transferred to the grid template by placing it on the patients face .These markings were transported to the side of the defect. These markings were transferred to the sculptured wax pattern and the iris button attached to it.

Investing, Dewaxing, Packing

The finished pattern was invested in a small two piece brass flask. A two part mold was constructed by the prototype ocular prosthesis by using dental gypsum in a two piece brass flask, the anterior portion of the mold was invested, a separating medium was applied and the posterior portion of the mold was then invested. The flask was then placed in a dewaxing bath for 20 min. The anterior and posterior portions of the flask were separated. The iris disc was shade matched with the adjacent eye and cut out from a stock eye. The color of the sclera was selected using tooth color acrylic shade guide. Rayon thread fibrils were used to simulate vasculature, by monomer polymer syrup method. The selected shade of the sclera was matched with the heat cure resin which was then packed in the two piece flask. The flask was kept for curing for a period of two hours and thirty minutes to avoid any residual monomer.



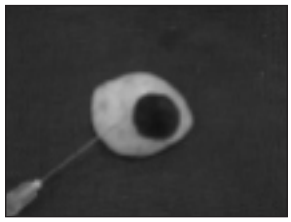


Fig 6 And 7: Dewaxing Of Eye Prosthesis

Placement Of Ocular Prosthesis

The Patient Was Instructed On The Aspects Of Insertion And Easy Removal Of The Prosthesis. Final Prosthesis Polished And Placed Into The Ocular Defect.

Fig 7 And 8 : Post Operative Photograph

Patient Follow up

The patient was asked to return on day 1, 2 and 7 for follow-ups after the prosthetic insertion.There after a 6 month follow-up was done for prosthesis evaluation and adjustment.

Discussion

The rehabilitation of the orbital defect is a complex task. A custom ocular prosthesis is a good option when reconstruction by plastic surgery or the use of osseointegrated implants is not possible or not desired. Systemic conditions and financial constraints may limit their use.

Advantages of a custom ocular prosthesis are:

1 Retains the shape of the socket.
2 Prevents collapse of the lids.
3 Provides proper muscular activity of the lids.
4 Prevents accumulation of fluid in the cavity.
5 Maintains palpebral opening similar to natural eye.
6 Has a gaze similar to natural eye.
7 Mimics coloration and proportions of natural eye

Conclusion:

The use of custom made ocular prosthesis has been a boon to the average patient who cannot afford the expensive treatment options available .The procedure used here is cheaper ,affordable and can be carried out in a small clinical set-up. This method has provided good results from patient esthetics, acceptance, and satisfaction points -of-view. Eye glasses that were used concealed the background effect and enhanced psychological comfort.

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Review Article

Speech considerations with complete denture

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Abstract

Speech production involves coordination of various neural, muscular,mechanical and auditory factors.It is the responsibility of the dentist to take care of the prosthetic problem of the patient as the orodental problems affect the speech of the patient

Key words
Speech, Brocas Area Wernickes Area

INTRODUCTION

Speech is a very sophisticated, autonomous, and unconscious activity. Its production involves neural, muscular, mechanical, aerodynamic, acoustic, and auditory factors. As orodental morphological features influence speech, the dentist should therefore recognize the role of prosthetic treatment on speech activity.

MECHANISM

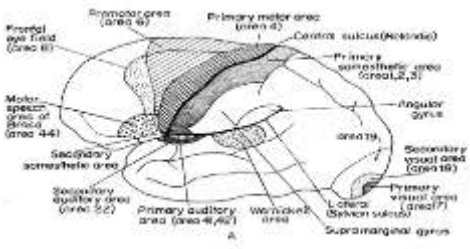
For speech, there are two very important areas in the cerebral cortex,

(i) Broca's area (after Paul Broca) or area 44,

(ii) Wernickes area (auditory psychic area)

The Broca's area is situated in the frontal lobe, inferior to the area 4 and the Wernicke's area in the posterior most part of the superior temporal gyri. In right-handed persons, Broca's area is found in left frontal (or the dominant hemisphere) lobe.

The mechanism of speech by an example: When someone (A) says "mouse" and the reaction of



another man (B) is as follows, the highest area of hearing gyrus of Heschl (area 41) comes into action. The Wernickes area interpret and understand the word mouse, than broca's area fire .Which activate appropriates muscles to pronounce the word where.

If the man wants to write what he has seen, the appropriate area 4 will be stimulated from Broca's area to produce written words on the paper.

Applied physiology

The term aphasia/dysphasia means defective speech due to damage of the Broca's area, Wernicke's area. This is due to thrombosis of the feeding artery of the region affected.

Aphasias can be classified as

(I)Sensory,

(ii)Motor, and

(iii)Global

In sensory aphasia, Wernicke's area is destroyed. The patient hears all right but cannot understand what he is hearing. When he speaks, he cannot understand his own words and the feedback from the ear is lost so there develops some incoherence in the spoken words too. Similarly, there may be failure to understand the meaning of the written words (word blindness).

In motor /expressive aphasia, the Broca's area is lost. The patient can here and follow spoken words, his internal speech is all right; but when he attempts to express his own thought processes, he fails. In global aphasia there is loss of both Wernicke's and Broca's areas

Dysarthria there is a defect in the motor cortex/cerebellum/or basal ganglia, so that vocalisation is imperfect. The term dsyphonia applied to all types of impairment in phonation. An articulatory problem without apparent neurological basis is called dyslalia

Motor process

Respiration provides the raw material for speech. The inspiratory-expiratorv cycle is altered during speech, with a prolongation of the expiratory portion. In phonation the breath stream sets into vibration This breath stream, with periodic and aperiodic component, must be shaped and modified through two additional processes:

1.Resonance, and

2.Articulation

Resonance is the selective amplification of the

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voiced tone; pharynx, oral cavity, and nasal cavity serves as resonators that reinforce certain components of the tone and suppress others. If the nasal cavities are coupled to the other cavities, a distinctive nasal tone results. The constrictor muscle of the pharynx and the levator palati together accomplish the coupling and uncoupling of these resonance chambers. Such alterations are brought about by differential positioning of the tongue and mandible and by alteration of the orifice through mandibular adjustments and changes in lip opening. Ultimately the breath stream is shaped into sounds (articulation) through impedances produced by various articulators.

Valving Function
Speech is influenced by a series of musculoskeletal valves.
1.Glottal valve- adduction of folds permits the production of a voiced tone and their abduction permits uninterrupted or voiceless passage of air.
2.Palatopharyngeal valve- The muscles of the soft palate and the pharynx constitute palatopharyngeal valve, which couples or uncouples the nasal cavities.
3.linguoavelar valve
4.linguopalatal valve
5.linguoalveolar valve
6.linguodental valve
7.labiodental valve
8.labial valve

The various valves interrupt, impede, and constrict the air stream in many ways to produce the complete repertoire of speech sounds.

COMPENSATORY MECHANISMS

A compensatory mechanism helps the individual to accommodate in startling ways to seemingly insuperable obstacles. Speech is possible even in case of Congenital a glossia or surgical excision of tongue, Children lacking maxillary incisors and yet can produce sounds that depends upon dental impedence of breath, Patients with open palatal clefts- may occlude the cleft, by means of unusual degrees of oral activity and extraordinary tongue movements, and yet produce consonants with an acceptable degree of oral pressure

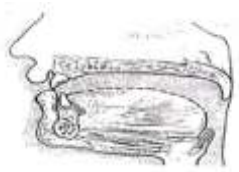
TYPES OF SOUNDS

Those smallest units which, not carrying meaning themselves, are combined to form the smallest meaningful units of the language—words MORPHEMES, Variable productions of a sound is called ALLOPHONES, recognized as variants of that sound, and they are appropriately grouped into a family, called a PHONEME. The phonemes of English can he divided into four groups: vowels, diphthongs, consonants, and combination

Vowels- Are open voiced sounds, involving vibration of the vocal folds and relatively unimpeded by the oral valves in their egress. (a, e, i, o, u and sometimes y).
Diphthongs- Are blends of two vowels spoken within a single syllable without interruption of phonation.
Consonants- Are phonemes, characterized by considerable impedance of breath stream and used adjacent to vowels and diphthongs to build syllables e.g church, judge, sauce, think, there.
Combination- Is a blend of a consonant and a vowel articulated in such quick succession that they are identified as a single phoneme although the blend can be separated into two-component sounds e.g beauty.

Classification by Place of Production

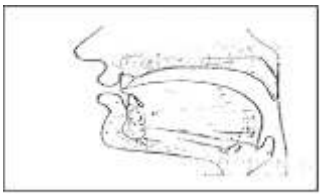
Labiodental Consonants:
The fricatives /f/ and /v/ are produced by forcing the breath stream through the contact made by the maxillary incisors with the posterior third of the lower lip. In the case of /f/, the breath stream is voiceless; in the case of /v/, the breath stream is voiced. The oral emission of these pressure consonants, the palatopharyngeal valve is closed.



If the upper anterior teeth are too short (set too high up), the v sound will be more like an f. If they are too long (set too far down), the f will sound more like v.

LINGUADENTAL CONSONANTS

The fricatives (e.g., th in this) are produced by forcing the breath stream through the constriction produced when the tip of the tongue is protruded between maxillary and mandibular incisors; the tongue and maxillary incisors touch or are closely approximated. The phoneme /theta/is voiceless and /delta/ voiced. For the oral emission of these pressure consonants, the palatopharyngeal valve is closed.



If about 3 mm of the tip of the tongue is not visible, the anterior teeth are probably too far forward (except in patients with a Class II malocclusion), or there may be an excessive vertical overlap that does not allow sufficient space for the tongue to protrude between the anterior teeth. If more than 6 mm of the tongue extends out between the teeth, the teeth are probably too far lingual.

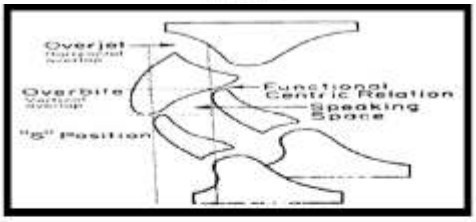
LINGUOLVEOLAR CONSONANTS

The three consonants /t/, /d/, and n have a common articulatry positioning, although two are plosives and one is nasal. The tip of the tongue contacts the alveo1ar ridge, with the sides of the tongue in tight contact with the teeth and gingivae. In the case of /t and /d, the palatopharyngeal valve is closed; impounded breath pressure is suddenly exploded orally.
In the case of /n/ the palatopharyngeal valve is open and the voiced breath stream is emitted nasally

The lingua-alveolar fricatives /s/ and /z/ result from the formation of a narrow midline groove of the tongue through which air is directed against the incisal edge of the teeth. The lateral margins of the tongue contact the teeth and gingivae and the blade of the tongue nearly touches the alveolar ridge. The palatopharyngeal valve is closed and the breath stream is unvoiced for /s/ and voiced for /z/.

The important observation when these sounds are produced is the relationship of the anterior teeth to each other. The upper and lower incisors should approach end to end but not touch. A phrase such as "I went to church to see the judge" will cause the patient to use these critical sounds, and the relative position of the incisal edges will provide a check on the total length of the upper and lower teeth (including their vertical overlap).

Vertical overlap of teeth- correct, excessive, inadequate

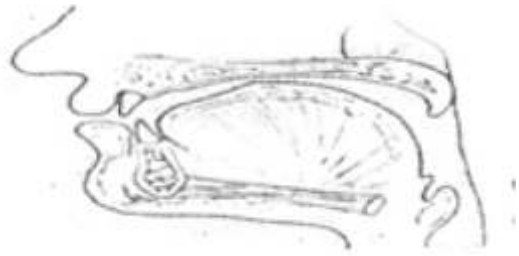


Determining vertical overlap

Linguo palatal Consonants

The consonant /r/ is a voiced semivowel; the sides of the tongue touch the maxillary teeth. The tip of the tongue is often pointed to an immediately post-dental area, but at other times, it is the tongue blade that is arched highest toward the palate while the tip points down. The palatopharyngeal valve is closed.

The consonant /j/ is a voiced linguapalatal glide, It is initiated with the tongue raised toward the front of the hard palate but in the course of its production the tongue moves to a position appropriate for articulation of the following phoneme. The palate pharyngeal valve is closed and the teeth are nearly approximated.



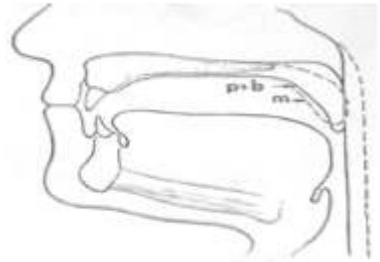
LINGUOAVELAR CONSONANTS

The so-called back consonants or gutturals, /k/, /g/. It produced by contact of the middle of the tongue with the soft palate. In the case of the plosives /k/ and /g/, the palatopharyngeal valve is closed; pressure is build up behind the linguavelar contact, and then released. In case of /ng/ (sing) the palatopharyngeal valve is open and the voiced airstream is nasally resonated

BILABIAL CONSONANTS

Distinctive valving involves the lips: in three, lip closure and in two, lip rounding, for /p/, /b/. and /n/ intraoral breath pressure is impounded behind closed lips palatopharyngeal valve is closed and the impounded air is suddenly exploded orally.

For production of the nasal /m/ the palatopharyngeal valve is open and the voiced air stream is resonated nasally



The consonants /wh/ and /w/ are bilabial glides. They require rounding of the lips, which subsequently move to the appropriate position for the following phoneme. The palatopharyngeal valve is closed. The voiceless /wh/ has a mild fricative component; its cognate is the voiced /w/.

GLOTTAL CONSONANTS

Consonant in which the constriction is at the level of the glottis (the space between the vocal folds) is /h/. The /h/ is an unvoiced fricative produced by the turbulence created when the breath stream passes between the partially approximated vocal folds. Part of the friction is probably created when the air strikes the surfaces of the pharynx and oral cavity. The palatopharyngeal valve is typically closed. Tongue and lip positions do not influence the character of the phoneme.

METHODS FOR SPEECH ANALYSIS

There are two categories: perceptual/acoustic analysis, and kinematic methods for movement analysis.

An acoustic analysis is based on a broadband spectrogram recorded by a sonograph during the uttering of different phrases containing key phrases.

Kinematic analysis includes such methods as ultrasonics, x-ray mapping, cineradiography, optoelectronic articulatory movement tracking, and electropalatography (EPG). None of these methods is, however, aimed for use in routine practice but rather after the failure of conventional means to improve an impaired speech production

PROSTHETIC CONSIDERATIONS

Older complete denture wearers experience greater difficulties in adapting their speech to new prostheses and need longer time to regain their natural speech. A frequent cause is impaired auditory feedback, and therefore a simple auditory test might be useful in such patients to make a proper diagnosis. Speech adaptation to new complete dentures normally takes place within 2 to 4 weeks after insertion. If mal adaptation persists, special measures should be taken by the dentist or by a speech pathologist. When new prostheses have to be made for these patients, certain difficulties in learning new motor acts may delay and obstruct the adaptation.

Consequently, a virtual duplication of the previous denture's arch form and polished surfaces, especially the palate of maxillary denture, this procedure will frequently solve a problem that may arise due to speech and adaptation difficulties. Variation in thickness and or volume of denture and of the vertical and horizontal dimension of occlusion may result in unpredictable audible changes to the voice. Patient should be informed about possible effects of modified or new denture on their voice2 .

Denture Thickness and Peripheral Outline

One of the reasons for loss of tone and incorrect phonation is the decrease of air volume, and loss of tongue room in the oral cavity resulting from unduly thick denture bases. The periphery of the denture must not be overextended so as to encroach upon the movable tissues, since the depth of the sulci will vary with the movements of the tongue, lips and cheeks during the production of speech sounds. Any interference result in indistinct phonation, especially if the function of the lips is in any way hindered. In the production of the palate lingual sounds, the tongue makes firm contact with the anterior part of the hard palate, and is suddenly drawn downwards, producing an explosive sound; any thickening of the denture base in this region may cause incorrect formation of these sounds.

The palatal rugae and incisive papilla often serve as a "cue". Because of the lack of palatal texture on the palatal portion of complete denture can impede proper articulation, one solution is to add rugae1. But if the artificial rugae are over-pronounced, or the denture base too thick in this area, the air channel will be obstructed and a noticeable lisp may occur as a result. To produce the Ch and J, Sh sounds if the palate is too thick in the region of the rugae, it may impair the production of these consonants

VERTICAL DIMENSION

The formation of the labials P, B and M require that the lips make contact to check the air stream. With P and B, the lips part quite forcibly so that the resultant sound is produced with an explosive effect, whereas in the M sound lip contact is passive. For this reason M can be used as an aid in obtaining the correct vertical height since a strained appearance during lip contact, or the inability to make contact, indicates that the bite blocks are occluding prematurely.

With the C (soft), S and Z sounds the teeth come very close together, and more especially so in the case of Ch and J; if the vertical dimension is excessive, the dentures will actually make contact as these consonants are formed, and the patient will most likely complain of 'clicking teeth'.

THE OCCLUSAL PLANE

The labiodentals, F, V and Ph, are produced by the air stream being stopped and explosively released when the lower lip breaks contact with the incisal edges of the upper anterior teeth. If the occlusal plane is set too high the correct positioning of the lower lip may be difficult, if on the other hand the plane is too low, the lip will overlap the labial surfaces of the upper teeth to a greater extent than is required for normal phonation a' the sound might be affected.

The Antero posterior Position of the Incisors

In setting the upper anterior teeth consideration of their labiopalatal position is necessary for the correct formation of the labiodental F, V and Ph. The inclination angles of central incisors on duplicate maxillary denture were changed from 0° to +30° to -30°. The change in both direction lead to poorer execution of /s/ sound. The labial angulation seem to have greater effect than palatal angulation3. If they are placed too far palatally the contact of the lower lip with the incisal and labial surfaces may be difficult, as the lip will tend to pass outside the teeth: the appearance usually prevents the operator from setting these teeth forward of their natural position.

If the anterior teeth are placed too far back some effect may be noticed on the quality of the palate linguals, S, C (soft), and Z, in which the tip of the tongue makes slight contact with the upper and lower incisors: this will result in a lisp due to the tongue making contact with the teeth prematurely.

THE PPS AREA

Errors of construction in this region involve the vowels I and E -and the palate velar consonants K, G.

A denture which has a thick base in the post-dam area, or that edge finished square instead of tapering, will probably irritate the dorsum of the tongue, impeding speech and possibly producing a feeling of nausea. Indirectly the post-dam seal influences phonation, for if it is inadequate the denture may become unseated during the formation of those sounds having an explosive effect, requiring the sudden repositioning of the tongue to control and stabilize the denture; this applies particularly to singers. Incidentally, speech is usually of poor quality in those individuals whose upper denture has become so loose that it is held in position mainly by means of tongue pressure against the palate.

WIDTH OF DENTAL ARCH

If the teeth are set to an arch which is too narrow the tongue will be cramped, thus affecting the size and shape of the air channel; this results in faulty phonation of such consonants as T, D, S, M, N, K, C and H, where the lateral margins of the tongue make contact with the palatal surfaces of the upper posterior teeth. Every endeavour should be made, consistent with the general mechanical principles, to place the lingual and palatal surfaces of the artificial teeth in the position

previously occupied by the natural dentition

Relationship of the Upper Anterior to the Lower Anterior Teeth

The S sound requires near contact of the upper and lower incisors so that the air stream is allowed to escape through a slight opening between the teeth. In abnormal protrusive and retrusive jaw relationships, some difficulty may be experienced in the formation of this sound, and it will probably necessitate adjustment of the upper and lower anterior teeth antero posteriorly, so that approximation can be brought about successfully. The consonants Ch, J and Z require a similar air channel in their formation.

Summary

To summarize, it will be seen that speech requirements call for dentures having a correct vertical dimension, an accurate periphery and an arch formation permitting natural tongue space, so that adequate freedom for movement is ensured. The position of the anterior teeth should be such that they follow that of the natural teeth, thus fixing the occlusal plane at the correct level and preventing the placing of the artificial teeth inside or outside the natural arch, which would require the tongue to adapt itself to new circumstances. Finally, denture bases should be fashioned suitably thin, but consistent with the other factors of denture construction, so that contact by the tongue takes place in as near a natural and normal manner as is possible.

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Review Article

STABILITY IN ORTHODONTICS AN OVERVIEW

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Abstract

The question of stability versus relapse has continued for decades and has resulted in much confusion and pessimism for many orthodontists.This has contributed to significant diversity in orthodontic treatment and retention.

Key words
Retention, Stability, Relapse.

INTRODUCTION

Stability

Maintaining teeth in an aesthetic, functional and healthy relationship for many years is one of the major goals of the orthodontic treatment. This is frequently referred to as "Stability" and should not be confused with the regular meaning as " the absence of movement". Hence the teeth should and in fact do adjust to their environment throughout life by varying degrees of movement.

It is also important that the orthodontist differentiate between post treatment changes in the dentition as a result of age related changes and "relapse". Webster defines "relapse" as " a return to a former worse state". Post treatment changes such as the collapse of the dental arch in either a lateral or antero posterior direction, primarily related to a " non-equilibrium" position of the dentition, constitutes relapse.

Age Related Changes:

Numerous studies have been attempted to identify possible treatment as well as growth related factors to changes in the dentition during the post treatment and post retention periods. Of particular interest to many investigators has been the study of lower incisor irregularity.

Irregularity Index (II) is defined as the summed displacement of the anatomic contact points of the mandibular anterior teeth from the mesial of one cuspid to the mesial of the contralateral cuspid.An II of less than 3.5mm was judged by a team of experienced orthodontists to demonstrate minimal irregularity and therefore appear clinically satisfactory. An II of greater than 6.5mm was judged to be severe irregularity.

It should be noted this measurement is not synonymous with that of tooth size to arch length discrepancy (TSALD),which is the amount of space needed to ideally align the teeth.As a general rule-

An II of 6mm = TSALD of 3mm

It is important to understand the age related changes in the untreated occlusions. Various studies were done. A review of following is shown next-

BARROW AND WHITE [1]- 51 children evaluated
(RESULT) - Mandibular incisor crowding :
14% at the age of 6
51% at the age of 14

ESLAMBOLCHI [2] - Treated and untreated children and untreated parents to age of 70.
(RESULT) - Age related changes in the dentition, particularly lower incisors crowding, occur up to the age of 70 in some individuals. On the other hand the velocity of change decreased after 40 years of age.

These studies suggest that the normal aging mandibular incisor crowding increases up to the age of 70 years, and its rate of change decreases slightly over time. To summarize it,the most important clinical implication from studies on untreated occlusions is that the lower incisor crowding to a certain degree is likely to occur in the majority of individuals as part of the aging process. In addition, mandibular arch width, particularly across the cuspids, as well as arch length, have a natural tendency to decrease over time. One should keep in mind, however, that these changes are usually only minor and not of the magnitude to be considered orthodontic failure or relapse!!

TREATMENT RELATED CHANGES IN THE DENTITION:

Numerous investigations have attempted to correlate post treatment changes in incisor alignment with treatment modalities such as extraction or non

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extraction treatment.

LITTLE et al [3] assessed the long term stability of 65 cases a minimum of 10 years post retention. All cases were treated with four 1st premolar extractions and traditional edgewise alignments was variable and unpredictable. In general, arch length and width decreased after retention, whereas crowding increased. The success of maintaining satisfactory incisor alignment(II <3.5mm) was less than 30%, with 16% of the cases demonstrating severe crowding(II>6.5mm) many years after retainer removal.

Sinclaire and Little* compared 65 untreated "normals" from the Burlington growth centre with 30 class I patients who had four first premolars extracted with edgewise orthodontic treatment, Pretreatment, posttreatment and 10 year post retention records were evaluated. Both groups demonstrated a similar annualized decrease in arch length. Interestingly ,mandibular incisor irregularity increased twice as fast in the treated group as in the untreated group, suggesting that other factors contributed to incisor irregularity; possibly treatment mechanics.

Uhde,Sadowsky and BeGole** compared 59 non extraction and 37 extraction cases with an average post treatment time of 20 yrs. Their findings agreed with those of previous studies that, in general, various dental measures tend to return toward their original values, following treatment. Mandibular intercanine width was found to be most closely related to post treatment mandibular arch crowding(TSALD).

Sandusky*** found more favourable results in a study of 83 patients treated with premolar extractions and tweed mechanics. After a mean of 10.6 yrs post treatment, he found a mean anterior TSALD of only 0.7mm.Interestingly,Sadusky observed that during treatment the lower incisors were uprighted relative to the mandibular plane an average of 8 degrees, whereas after treatment they rebounded in an anterior direction by about 3 degrees. He suggested that slight over correction of the lower incisor angulation during treatment may minimize post treatment incisor irregularity. He explained that as the incisors proclined as a result of forward "rebound", space would be created in the anterior region of the lower arch to compensate for any possible decrease in arch length and/or width.
Paquette,Beattie and Johnston**** compared the longterm results of extraction and non extraction edgewise treatments in 63 patients with class II div 1 malocclusions. Although al patients were identified as equally susceptible to the two treatment strategies,30 were treated non extraction and 33 were treated with four first premolar extraction. After an average post treatment interval of 14.5 yrs,73% of the extraction patients exibited good lower incisor stability (II<3.5mm),while 57% of the non extraction patients showed good stability. The type of treatment as well as the initial position of the dentition failed to explain the pattern of post treatment change. The authors speculated that these changes were a result of dento alveolar compensation produced by differential jaw growth during the post treatment period, i.e age related changes.

Little,Reidel and Stein***** evaluated the stability of non extraction treatment in the mixed dentition in order to determine if early treatment would yield better long term results.The treatment envolved increasing the arch length by means of fixed edgewise appliances, active lingual arches, lip bumpers or removable appliances. Arch length had to have been increased a minimum of 1 mm to qualify for inclusion in the study. Patients were studied a minimum of 6 yrs post retention, and showed both a decrease in arch width and increase in crowding. Twenty three of the 26 patients (89%) demonstrated clinically unsatisfactory alignment (II>3.5mm) as well as a reduction in mandibular intercanine width following retention.
The authors concluded that the "arch length increase may yield the poorest stability". The findings of this study are significant and do not support the generally held belief that early treatment is more stable. This study provides some evidence to challenge the notion of non extraction treatment through "developing the arches" and questions the premise of such a treatment approach in yielding stable results. If the mandibular dental arch dimensions post treatment return to their original value with such treatment strategies, what have we "developed?"

RECENT STUDIES ON TREATMENT RELATED CHANGES IN THE DENTITION:

More recently, Franklin^^ investigated the longitudinal dental and cephalometric changes in 114 patients treated with tweed edgewise orthodontics. Pre treatment, post treatment and post retention records were obtained and measure for all 114 subjects. All subjects had lower banded cuspid to cuspid retainers removed after 3 yrs., with an average post retention follow up period of 11.97yrs.

Satisfactory long term stability was achieved in the majority of patients(79%) in this sample. Despite minimum expansion of<1mm during treatment,mandibular intercanine width decreased to slightly less than its original value following active treatment. Another point of interest was the finding that a significant greater reduction in this dimension occurred in those subjects who received more expansion during treatment. Mandibular incisor irregularity increased following treatment. Only minimal changes were observed in the majority of the subjects, reflecting"developmental"changes rather than "relapse".

Additional study by Schroeder studied the long term stability of classII div 1 four premolar extraction treatment. Dental casts and cephalograms of 27 patients were evaluated pretreatment ,post treatment and 9 yrs postretention. In general during the post retention period, arch widths and arch lengths decreased overbite increased overjet remained stable, interincisal angle increased irregularity increased and the occlusal plane flattened. The mandibular canine width, which was expanded only 0.57mm during treatment, constricted 1.5mm post retention. Mandibular incisors were retracted a mean of 1.94mm during treatment. They advanced on average 0.10mm post retention. Mandibular incisors were uprighted an average of 2.13degrees during treatment and proclined0.24degrees post retention. The mandibular irregularity pretreatment, post treatment and post retention was on average 5.54mm,1.45mm and 2.49mm.From here it was concluded that though changes were seen in the post retention period, little relapse of the treatment was observed.

All these studies suggest that satisfactory long term stability following orthodontic treatment can be expected in the majority of patients if sound treatment principles are employed.

FACTORS ASSOCIATED WITH POST RETENTION DENTAL CHANGES

Associations and relations that were found by Franklin, Marks and Schroeder were:

- The mandibular incisors showed the most rebound followed by the canines and then the molars.
- The greater the proclination of mandibular incisor during treatment, the greater the irregularity
- Post retention. Post retention reduction in anterior arch length correlated with increased irregularity. One of the highest predictors of post retention irregularity was the degree of irregularity

remaining after treatment.
- Post retention irregularity was most highly correlated with vertical dentoalveolar changes after retention.
- Post retention, all mandibular arch width dimension decreased, very slightly.

ELEMENTS OF SUCCESSFUL TREATMENT

- A burning desire for excellent treatment results.
- Establishing proper goals: good facial esthetics and a healthy functional, stable dentition.
- Recognizing biologic limitations and treating within the confines of the envelope imposed by the soft tissue and the basal bone.
- Prior and prompt treatment objectives prior to starting of treatment-
- Maintain the original mandibular arch form.
- Minimise the expansion of the mandibular intercanine and intermolar width.
- Upright and retract the lower incisors or at least maintain the mandibular incisors in their original position.
- Obtain an ANB of 2 degrees +/-2 degrees.
- Achieve a super class I occlusion.
- Overcorrect the anterior overbite and overjet.
- Control the posterior vertical dimension by minimizing the extrusion of the molars.
- Maintain the cant of the occlusal plane.
- Eliminate Bolton tooth size discrepancies.
- Upright the mandibular molars and premolars.
- Establish proper rotation of the maxillary 1st molars.
- Avoid relative intrusion of the mandibular incisors.
- Establish an inter incisal angle of approx 130-135 degrees.
- Parallel roots adjacent to extraction sites.
- Diverge the root of the mandibular incisors.
- Rotations should be corrected totally.
- Perform supracrestal fibrotomy of severely rotated teeth.

Proper Mechanotherapy to be used.
Commitment to fulfill treatment objectives.

CONCLUSION

A reawakening needs to occur in our profession where by the measure of success is based upon compassion and the drive for excellence. It is the prime responsibility of the clinician to look after the best interest of their patients. The rewards to the patient and the self satisfaction of obtaining an aesthetic, healthy, functional and stable result far outweigh the effort and discipline it takes to achieve it. It is hoped that the orthodontists will provide a first step toward better defining the reactions of the untreated and treated dentition and help better delineate factors associated with stability and relapse.

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Review Article

EXACT 'O' BITE: WHAT MATERIALS?

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Abstract

An exact reproduction of occlusal relation on the articulator during all stages of treatment for fabrication of prosthesis depends upon correct interocclusal records. The records are totally dependent on procedures and materials used for the recording from time of diagnosis until the definitive treatment. Various materials' for recording the interocclusal record are discussed.

Key words

Bite Registration, Silicones, Interocclusal Records.

INTRODUCTION

Obtaining accurate maxillo-mandibular registrations is fundamental for the appropriate relation of the casts. The clinical results depend on the exact reproduction of the interocclusal relation in the articulator from the time of diagnosis until the definitive treatment. Thus, the role of inter-occlusal registration in oral rehabilitation is highly relevant. In prosthetic dental treatment, casts, which duplicate the patient's dentition, are frequently mounted in an articulator, which simulates jaw movements.

Ideal Requirements of Interocclusal Bite Registration Material:

1.Limited resistance before setting to avoid displacing the teeth of mandible during closure.
2.Rigid or resilient after setting.
3.Minimal dimension changes after setting.
4.Accurate record of the incisal and occlusal surface of teeth.
5.Easy to manipulate.
6.No adverse effects on the tissues involved in recording procedure.
7.The interocclusal record is verifiable.

Types of Interocclusal Recording medium:

1.Plaster of paris.
2.Waxes.
3.Zincoxide eugenol pastes.
4.Silicone elastomers.
5.Polyether elastomers.
6.Acrylic resins.

1.Impression Plaster :

Advantage: Records of impression plasters are accurate, rigid after setting and do not distort with extended storage.

Disadvantage : Impression plaster is difficult to handle because material is fluid and unmanageable prior to setting.

Technique :

Impression plaster is applied over the top of the recording plate and the patient is asked to close in centric relation. The impression plaster on the adjacent teeth is cut away so that a rectangular contact area in plaster remains. Undercuts due to adverse tooth contours are reduced to assure removal of the plaster without chipping or cracking the record. Right angle cuts are made on buccal and lingual / palatal indices of the teeth adjacent to the copings. The interocclusal record and the buccal and lingual / palatal indices are removed and are reassembled. The dies are positioned in the record and a master cast is poured.

2.Waxes

The bite registrations are frequently made from 28 gauge casting wax or from base paste wax, specially formulated from bee wax or hydrocarbon waxes such as paraffin or creasin. They have been used in the shape of quadrant strips or segments, horse shoe shape wafers and complete or partial arch wafers and can be applied directly in sheet form or they can be laminated over tinfoil and gauze.

Advantage: A major factor in popularity is clinical flexibility of waxes and accounts for the broad range are which records can be modified changed, corrected and verified with comparative ease.

Disadvantage: Studies have demonstrated that wax interocclusal records are inaccurate, unstable and inconsistent.

Technique: A wax interocclusal centric relation record is made before the abutment are prepared. Then the abutments are prepared and another interocclusal record is made with a half of sheet of softened wax. The wax is molded into the shape of the dental arch and is positioned on the teeth and the patient is asked to close the jaws or, the mandible is

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guided into centric relation. Then patient is asked to open and close the mouth several times. The wax is cooled with water, while the teeth are held together, the patient is asked to open the mouth and the wax is cooled further. The total cooling must be atleast two minutes. The wax record is removed from the mouth and is allowed to cool for one minute under running water. The wax record is trimmed for possible interferences and is returned to the mouth. The trimming for possible interferences is done by shaving the wax with a sharp blade to prevent its distortion. The seating of record on the teeth and closure must be precise. The registration is compared with the record made prior to abutment preparation.

3. Zinc oxide Eugenol Paste

Zinc oxide Eugenol paste is an effective interocclusal registration material.

Advantages: Fluidity before setting – Fluidity is a critical quality of an interocclusal registration material because it ensures minimal interference with mandibular closure during record making procedures.

- Adhesion to its carrier.
- Rigidity and inelasticity after final set.
- Accuracy in recording occlusal and incisal surfaces of the teeth.
- High degree of repeatability Disadvantages:
- Lengthy setting time.
- Significant brittleness.
- Accuracy of the registration material may surpass the accuracy of the casts resulting in proper fit.

Technique: A Jones frame is used to carry the paste into position between the teeth. Sufficient paste is mixed to cover both sides of the gauze and to register half of the length of the abutments and at least one adjacent tooth. The frame is placed distal to the last tooth to prevent impingement upon the metal of the frame. The patient is asked to close in centric relation. The record is removed from mouth after the paste has set. The interocclusal record is then removed from the frame and is used for mounting the cast.

4. Silicone Elastomers :

Two types of elastomers are available as interocclusal registration materials.

1.Addition silicone
2.Condensation silicone.

Advantages:

- Accuracy
- Stability after setting.
- Minimal Resistance to closure.
- Does not require a carrier.

Disadvantage

- Resistance to compression of a set material which contributes to difficulty.

Technique:

Take equal amount of base paste and catalyst paste and mix according to manufacturer's instructions obtaining a streak free mixture. Load the syringe by maintaining a slight angle while scraping the pad. Place the material over the occlusal surface of teeth. Guide mandible to centric and ask patient to occlude, wait for final set according to manufacturers instructions. Trim the excess and recheck the record.

5. Polyether Elastomer :

Advantages:

- Accuracy
- -Stability after polymerization and during storage.
- Fluidity and minimal resistance to closure.
- Does not require carrier.

Disadvantage:

- Resiliency and accuracy may exceed the accuracy of plaster casts.

Technique:

Place the material over the occlusal surface of teeth. Guide mandible to centric and ask patient to occlude ,wait for final set according to manufacturers instructions. Trim the excess and recheck the record.

6. Acrylic resin:

Advantages: Accurate and rigid after setting.

Disadvantage: Polymerization shrinkage.

Technique:

Apply petroleum jelly over occlusal surfaces of teeth. Measure monomer and polymer according to manufacturers recommendations wait until dough stage is reached. Form dough patty into a flattened shape approximately 2mm thick. Keep it over occlusal surfaces of teeth. Guide mandible to centric position and ask patient to occlude. Wait for final set according to manufacturers instructions. Trim the excess and recheck the record.

CONCLUSION

The success of rehabilitation treatment is closely related to an exact reproduction of occlusal relation in the articulator during all stages of treatment. The conditions are totally dependent on procedures and materials used for the interocclusal records which should result in the installation of prosthetic restorations, with a minimal occlusal adjustment. The interocclusal registrations must be obtained with special attention to the materials and manufacturer's instructions.

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Review Article

TOOTH TRANSPOSITION – A REVIEW

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Abstract

Tooth transposition is a rare developmental anomaly that may create problems from both esthetic and functional points of view. Tooth transposition occurs when adjacent teeth switch positions. The maxillary permanent canine is the tooth most frequently involved, which is transposed most often with the first premolar followed by transposition between the maxillary permanent canine and maxillary lateral incisor. This paper focuses on the prevalence, possible etiologic factors, classification and treatment aspects

Key words
Transposition, Ectopic Eruption.

INTRODUCTION

Tooth transposition is defined as a unique and extreme form of ectopic eruption in which a permanent tooth develops and erupts in the position normally occupied by another permanent tooth.1Although the term ectopic eruption is often used in a wide sense to refer to any aberrant and abnormal eruption path taken by a tooth, the term transposition is confined to refer to an interchange in the position of two adjacent teeth within the same quadrant of the dental arch.2,3 It is a relatively rare developmental dental anomaly; the maxillary permanent canine is the tooth most frequently involved. Other dental anomalies, such as congenitally missing or peg-shaped maxillary lateral incisors, rotations and malpositions of the adjacent teeth, and retention of the deciduous canines, are most often associated with transposition.3,4,5,6 Transposition may be complete or incomplete.1,5,6 In complete transposition both crowns and entire root structures of the involved teeth are found in their transposed malposition. And in an incomplete transposition the crowns may be transposed, but the root apices still remain in their relative normal positions.1, 5, 6

Incidence and prevalence

Transposition may affect both sexes equally and, although it may occur in the maxilla or in the mandible, the frequency of maxillary permanent canine involvement is the greatest.1 In the maxilla the canine is transposed most frequently with the first premolar, less often with the lateral incisor followed rarely by central incisor or second premolar.1, 4 In the mandible transposition is reported to involve the canine and lateral incisor only.

It has been reported that transposition of maxillary teeth occurs approximately in one of 300 hundred orthodontic patients and that transposition between the canine and first premolar appears most often (70%) in maxillary dentition, followed by one between canine and lateral incisor (20%).2 ,3

Transposition has never been reported in both arches simultaneously and it has never been reported to occur in the deciduous dentition. Unilateral transpositions are found more often than bilateral transpositions and show left side dominence.2, 5

ETIOLOGY

Although there are several theories put forward, the etiology of transposition is still unclear. A possible explanation for tooth transposition would be an exchange in position between developing tooth buds and also genetic or hereditary factor can play a role. 3, 6 The maxillary canine is more likely than any other tooth to become impacted or transposed. The maxillary permanent canines has longest period of development and long way to travel from early formation stage to its complete eruption.7, 8 During its long eruption pathway, the canines move labially and mesially and can be palpated high in the labial sulcus.7 Observing the high incidence of maxillary canine transposition one possible cause may be prolonged retention of deciduous canines. Other causes of transposition include trauma, mechanical interference, bone disease, tumors or cysts.1, 7, 8

Following a multifactorial hereditary model, Peck et al2 and Ely et al10 suggested that transposition of a maxillary canine and first premolar is genetically controlled and also environment plays a role.2, 10 This conclusion was reached because of the moderate rate of bilateral occurrence, increased prevalence of

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additional dental anomalies as hypodontia, occurrence following a hereditary pattern, and varying prevalence among populations.2, 10

CLASSIFICATION OF TRANSPOSITION

Peck and Peck11 conducted a wide review of case reports of tooth transpositions in the maxillary arch and established a classification based on anatomical factors. From 201 case reports reviewed, the authors systematically classified transposition, in decreasing order of frequency

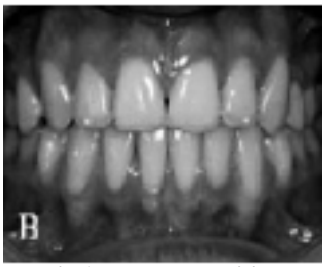

Fig 1:Normal Dentition

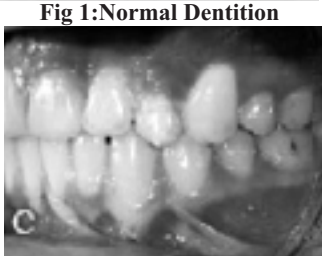

Fig 2:Transposition Of Canines To Premolar Region

Fig 3:Transposition Of Canines To Lateral Incisor Region

Fig 4:Transposition Of Canine To First Molar Region

Fig 5:Transposition Of Lateral Incisor To Central Incisor

Fig 6:Transposition Of Canine To Central Incisor Region

(Fig 2-6 depicts the possible transpositions that may usually occur, Fig 1 shows normal Dentition):

1. Canine—first premolar (Mx.C.P1)
2. Canine—lateral incisor (Mx.C.I2)
3. Canine to first molar site (Mx.C to M1)
4. Lateral incisor—central incisor (Mx.I2.I1)
5. Canine to central incisor site (Mx.C to I1)

In the classification aberrant positioning of the maxillary canine is a feature of four of the five types, the exception being the special situation of lateral incisor-central incisor transposition.

TREATMENT CONSIDERATION

Early diagnosis of a developing transposition is extremely important and has a great influence on prognosis. This may usually be performed by a radiographic examination when the patient is between 6 and 8 years of age. When the alteration is detected early, interceptive procedures including extraction of deciduous teeth and placement of eruption guides for the permanent teeth may be performed, thus preventing complete development of the anomaly. On the other hand, when transposition is detected at a later stage, orthodontic treatment planning and intervention must be addressed.1, 3 Upper canine-premolar transposition in adult patients allows consideration of several treatment options, with or without extraction of the premolar.3, 12

In nonextraction treatment, generally the position of transposed teeth is maintained without restoring their natural tooth position. However, the upper canine-premolar transposed order provides esthetic and functional considerations. The differences in the size, shape, and tooth color between canine and premolar sometimes cause anterior esthetic problems. The gingival contour of the premolar is lower relative to the canine, requiring a periodontal gingival recontouring procedure. The palatal cusp of the transposed premolar might cause functional interference. The size and shape of premolar are completely recontoured to resemble a canine after root canal treatment .1, 12

Treatment with premolar extraction is considered as one of the alternatives. The transposed tooth is then moved to its natural position. This treatment approach is preferred when there is a severe arch length deficiency. Root interference needs to be considered. Root interference during tooth movement to correct tooth order tends to occur more frequently in canine-premolar transposition than in lateral-canine transposition. This probably occurs because the labiolingual width of a premolar is much wider than that of the lateral incisor.

In addition, gingival recession around the repositioned canines should be considered because of the long journey of canine through the dense buccal compact bone.1, 12, 13 The other problem in restoring the natural tooth order is prolonged orthodontic treatment

due to difficulties in root movement.13 As a general rule, it is not advisable to correct a transposed tooth order because of insufficient buccopalatal width of bone support when two adjacent teeth are moving in different directions.1, 13

Summary

Tooth transposition is defined as the positional interchange of two adjacent teeth within the same quadrant. Tooth transposition is a rare positional anomaly that causes problems in both esthetic and functional aspect. Although the etiology of tooth transposition remains unclear, two principal theories of this anomaly have been proposed. One is migration of the tooth buds from the normal path during odontogenesis. The other is a genetic influence. The maxillary permanent canine is the tooth most frequently involved. Therefore, the maxillary canines should be regularly monitored after early loss of deciduous teeth. Transposition is also associated with other dental anomalies, such as congenitally missing or peg-shaped maxillary lateral incisors, rotations and malpositions of the adjacent teeth, and retention of the deciduous canines. Transposition may affect both sexes equally and shows higher maxillary prevalence. It is not seen in both the arches simultaneously and also is not seen in deciduous dentition. Unilateral transpositions are found more often than bilateral transpositions and show left side dominence. Treatment options for transposition include early diagnosis and guiding eruption to orthodontic management either by non-extraction or extraction modalities. When treating transpositions, especially MxC.P1, many factors that affect the treatment results must be considered, such as esthetics, occlusion, treatment period, patient comfort, patient cooperation, and periodontal support. For the achievement of optimal function and esthetics in cases with tooth transposition requires the utmost care in the design of the treatment.

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Review Article

MANAGEMENT OF POOR RIDGE CASES – A CHALLENGE IN CLINICAL PRACTICE

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Abstract

Resorption of bone is a normal process. Its balance to bone apposition may be either physiologic or pathologic and is dependent upon multiple factors. Treatment of rapid (pathologic) resorption is difficult because the multiple factors are interrelated & it is impossible to evaluate clinically or radiographically the precise part played by each. A normal bone picture requires that all known body fluids & elements both intrinsic and extrinsic are in proper harmony and composition.

Key words
Bone Resorption, Flabby Ridge, Retention

INTRODUCTION

In order to render the best possible treatment for endentulous patient, a clinician must not only perfect the (1) Clinical techniques but also must have a broad insight into the (2) factors related to residual resorption and its management. Residual ridge resorption in itself is a coupler biophysical process and a common occurrence after extraction of teeth. Hence our aim should be to overcome the factors related to RRR and fabricate a stable and retentive denture.

Factors related to residual ridge resorption

I) Anatomic Factor: Deals with the rate of resorption of the alveolar bone depends to a great degree upto the type of bone structure anatomic factors include size, shape cortical caucelous and density of the ridges, the thickness and character of the mucosal covering, ridge relationships number and depth of the sockets. (1)

II Metabolic factors: These are multiple nutrition and hormonal factors which influence the relative cellular activity of the bone farming cells and thus affect the rate of resorption of the residual ridges. (1,2)

IIIFunctional factors : Force within certain physiological limits is applied to living bone, these forces whether compressive, tensile or shearing bring about remodeling of bone, frequency, intensity, duration and direction of force applied are somehow translated into biologic cell activity resulting in either bone formation as bone resorption depending upon the patients individual resistance to these forces. (1)

IV) Dietary factors: Abnormalities of calcium-phosphorus elements of the blood stream are associated with alveolar resorption & rarefaction deficiency of vitamin A causes poor calcification of bone. Deficiency of vitamin C causes decalcification of bone & is responsible for diffuse alveolar atrophy. Deficiency of vitamin D, disturbs the calcium phosphorus balance and promotes bone resorption.(3)

V) Prosthetic Factor: Includes various techniques, materials, concepts, principles incorporated in the prosthesis, it is desirable for a prosthesis to fit well and distribute its load over as wide are area as possible, that load being dept to minimum by careful selection of tooth material and form. Tytle (a clinician) had demonstrated increased radiolucency in the alveolar process under an ill fitting prosthesis which was reversed by rebasing it with resultant ever distribution of denture load.

Oral Examination: A thorough examination of an edentulous patient includes a detailed history and psycho logic assessment of the patient along with a visual and digital survey of the oral cavity signification of the history of the patient especially in case of an old denture wearer is essential as it helps in assessing the psychology of the patient which in turn reflects the patients attitude towards accepting a denture – which plays an important role in the success of any prosthetics delivered to the patient

Radiographic Examination: Intracranial radiographs are taken in order to observe the density of the residual ridges. A C.T. scan of the maxilla and the mandible helps to determine the quantity of bone in the residual ridges.

Cephalometric tracings show variation in size and shape of the jaws. Resorption of the residual ridges is

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measured cephalometrically after the extraction of teeth.
Mclean and Urist state that a loss of 24-30% of bone salts is necessary to produce an appreciable change in radiograms of bone (Although a broad high ridge has a greater potential bone loss, the rate of vertical bone loss may actually be slower than that of a small ridge because these is more bone to be resorted per unit of time)

Management of Residual ridge resorption:
Prior to treating a patient who exhibits marked loss of alveolar bone, 2 Important factors must be considered:

- Psychology of the patient
- Role of systemic diseases as an etiologic factor in gross alveolar resorption.

(Patients with gross alveolar desorption lack denture stability and tend to slide over the mucosa leading to trauma, especially in very thin ridges, in which the denture presses against the oral mucosa).

Techniques of prosthodontic management:
Which are of significance are:
(I) Mouth preparation prior to designing a prosthesis.
(ii) Fabrication of stable and retentive dentures.

Mouth preparation prior to designing a prosthesis: The oral tissues change their shape with time and eventually the pressure-transmitting surfaces of the denture will be poorly adapted to the oral mucosa prior to construction of new prosthesis, these faults should be eradicated where ever possible buy occlusal grinding or the modification of the pressure-receiving surface of the teeth. Failure to carry out such corrective therapy can result in continuing distortion of the oral tissues by the dentures and difficulty in recording Jaw relationships.(4)

Fabrication of stable & retentive dentures: is related to the concentration delivered to 3 surfaces of the denture namely:

- Pressure receiving surface.
- Secondary suppose ting surface
- Pressure transmitting surfaces

Pressure receiving surfaces: Comprises of the occlusal and incisal aspects of the artificial teeth.
- The use of narrow posterior teeth results in less pressure over the alveolar process during mastication.
- Teeth with a low cusp angle or inverted cusps assists further in the stability of the denture.
- Teeth fabricated of acrylic resin provide a cushioning effect over the mucosa as compare to porcelain teeth

Secondary supporting surfaces: Polished surface border deal areas. Accurate contouring of the secondary supporting surfaces of a denture especially in a patient with gross alveolar resorption is extremely significant in order to achieve stability and retention.

- Polished surfaces of the denture should adapt to the soft tissues and musculature of the oral cavity.
- Use of heat cured acrylic resin bases is recommended in patients with gross RRR as this significantly improves the retention and stability of the record blocks.

Pressure-transmitting surfaces: Should have the maximum possible area without overextension over the muscle attachments in order to reduce pressure on the oral mucosa.

- A functional impression technique introduced by Boucher is laudatory in order to achieve and record the muscle attachments.
- Recording the correct vertical dimension and providing more free-way space (3.5mm) in patients with increased Residual ridge resorption is rightly beneficial.
- Prosthodontist should concentrate in capturing the correct centric relation record.
- It should be the aim of every prosthodontist to record centric relation and re-establish the lost centric occlusion.
- Soft liners-Soft tissue distortion can be corrected with the use of soft resilient reliners.

Accessory aids in retention: (4)
Magnets: embedded in the alveolar process and the denture in the molar region in order to attract the denture to the alveolus but this has its limitation causes the constant pressure produced by such magnets results in increased rate of Residual ridge resorption.

Spring: Inserted in the denture unstable the denture anterio-posteriorly and constant pressure causes RRR thus this technique should be avoided by prosthodontist and utilized only when the accepted prosthodontic techniques have failed.

Surgical Management
In case of server RR surgery should be considered if the prognosis appears beneficial to a considerable extent.

- Recovery of local bony excrescences or fibrous nodules.
- Increasing the height of the alveolar ridge with the use of cartilage homograft, bone autografts, freeze derived bone and silicone rubber enclosed in knitted dacrous.
- Repositioning the attachments of the soft tissues to the Jaws so as to increase the denture bearing area.
- Insertion of subperiosteal implant dentures.

CONCLUSION

Apart from the accepted prosthodontic techniques described it is extremely important for every dentist to analyze the underlying systemic causes for patients with RRR and lastly the psychological acceptance of the prosthesis by the patients contributes to its success. Thus to deal with the causes of gross alveolar resorption and hence to fabrication a successful denture in patients with poor residual ridges should be the aim of every Prosthodontics.

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Review Article

Temporary Anchorage Devices Simplified

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Abstract

A temporary anchorage device is defined as a device that is temporarily fixed to bone for enhancing the orthodontic anchorage either by supporting the teeth of the reactive unit or by obviating the need for the reactive unit altogether, and which is subsequently removed after use. By using dental implants and temporary anchorage devices for orthodontic purposes we are able to obtain zero anchorage loss.

Key words
Anchorage, TAD, Implants

INTRODUCTION

A temporary anchorage device (TAD) is a device that is temporarily fixed to bone for the purpose of enhancing orthodontic anchorage either by supporting the teeth of the reactive unit or by obviating the need for the reactive unit altogether, and which is subsequently removed after use.

They can be located transosteally, subperiosteally or endosteally; and they can be fixed to bone either mechanically (cortically stabilized) or biochemecially (osseointegrated). It should also be pointed out that dental implants placed for the ultimate purpose of supporting prosthesis, regardless of the fact that they may be used for orthodontic anchorage, are not considered temporary anchorage devices since they are not removed and discarded after orthodontic treatment. By using dental implants and temporary anchorage devices for orthodontic purposes we are able to obtain zero anchorage loss1.

The selection of a proper anchorage is an essential factor for the successful orthodontic treatment. Every orthodontic device, which exercises a force onto the tooth, generates an opposite force which then affects the anchorage. The implant in the bone remains stable, which ensures a secure anchorage when no teeth are used.

HISTORICAL BACKGROUND

Gainsforth and Higley suggested using metallic screws as anchors as long as 19452. Following the successful use of conventional prosthodontic implants, osseointegrated implants were used for intraoral orthodontic anchorage. Creekmore and Eklund in 1983 were the first to introduce screws in clinical orthodontics for the sole purpose of orthodontic anchorage3. In the 1990s, surgical screws (also referred to as mini-screws, mini-implants and micro-screws) increasingly were used to provide anchorage for orthodontic tooth movement. Both animal and human studies provided a basis for their clinical use. Mini-screw implants, often referred to as temporary anchorage devices (TADs), have become an accepted component of orthodontic treatment. The comparatively simple technique for the placement of these mini-screws is described with emphasis on the importance of correct site selection as well as an understanding of the possible complications that may arise.

Use of TADs in orthodontics

Temporary anchorage devices (TADs) for orthodontic anchorage are widely accepted. They are changing the way orthodontists treat some patients' malocclusions. TADs provide a fixed point from which to apply force to move teeth. They can be placed in many different sites in the mouth. Placement is customized for each patient. TADs may contribute to predictable results, shorter treatment time and completion of active treatment on schedule.

Figure 1 TAD range from 6-12 mm in Length

There is little or no discomfort when a TAD is placed. Caring for your TAD generally requires only routine brushing..Although small, the TAD does a big job of helping the orthodontist to move teeth predictably into their optimal positions without anchorage loss TADs are titanium-alloy mini-screws, ranging from 6 to 12 millimeters in length and 1.2 to 2millimeters in diameter. They are fixed to bone temporarily to enhance orthodontic anchorage. Titanium alloys have been used as joint replacements and for dental implants for many years. These alloys are not rejected by the body. Orthodontists often use holding

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arches, also known as space maintainers, and headgear to control anchorage and minimize the movement of certain teeth while carrying out the desired movement of other teeth. TADs allow orthodontists to overcome limitations of holding arches and headgears and to perform difficult tooth movements predictably. TADs can also provide a point of anchorage for patients with missing teeth.

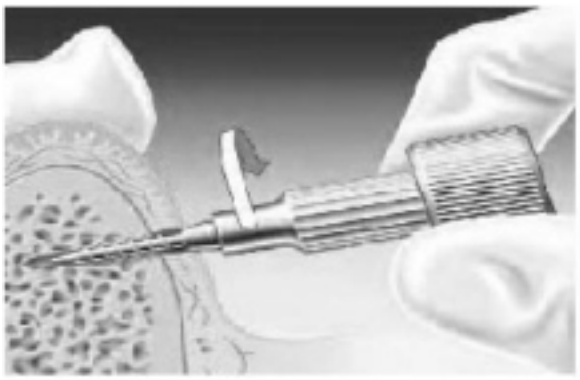

Figure 2-Placement of a TAD or a mini implant in the bone

Site for implant placement
TADs are placed in the bone between the roots of the teeth and can be placed in the bone in the roof of the mouth as well.

Procedure for implant placement
Placement is minimally invasive and often completed using only topical anesthetic. TADs are inserted directly into the bone using a special instrument. There is little or no discomfort because there are no nerve endings in the bone tissue. Once placed, the orthodontist is able to use the TAD as orthodontic anchorage immediately. Because of the possibility that TADs can loosen or fall out, patients should avoid picking or pulling at the TAD. If the TAD does become loose or come out, call your orthodontist as soon as possible

Figure 3-The site for the TAD is selected

Figure 4-The TAD immediately after placement.

Because orthodontists have the training and expertise to place them, many orthodontists place TADs themselves. This ensures the TAD is placed exactly where the orthodontist wants it. Some orthodontists may choose to have a TAD placed by another dental specialist.

Figure 5-A TAD/ Implant as an anchor

Duration for the TAD.
The orthodontist decides about how long a TAD will be needed. It may be required only for a few months, or it may be needed throughout your orthodontic treatment. TADs are versatile and may be used in different areas of the mouth during different parts of treatment

Age considerations
TADs are placed on patients who have permanent teeth. Patients with active periodontal (gum) disease may not be candidates for TADs4.

Clinical usage of TADs for various orthodontic applications.
A typical First premolar extraction case

Figure 6- Implant used for Retraction

A mini implant deployed between roots of the 2nd premolar and first molar for absolute anchorage during en mass retraction5,6

Figure 7-Retraction completed with no anchor loss

Other Orthodontic Applications of TAD'S

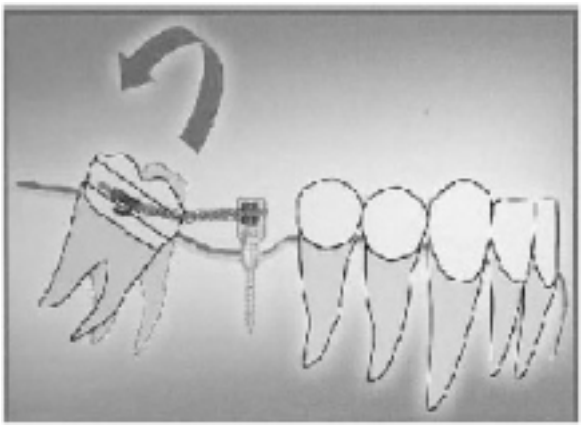

Figure 8-Use of a micro implant for molar uprighting

Figure 9-Use of micro implants for incisor intrusion

Figure 10- Implants used for Retraction used for canine and en-mass retraction

Figure 11- Implants for Intrusion of a segment

SUCCESS AND FALIURE OF TAD'S

Success in microimplant orthodontics is defined as a microscrew with minimal mobility and inflammation and the ability to obtain full functional correction either through direct or indirect anchorage. In 1999, Park and Kim7 reported a success rate of 82% after 5 months of observation. In 2003 a 93% success rate was reported during a 15.8 month observation period8. Other studies have shown a similar level of success9-11. Microimplant orthodontics has a learning curve; with more experience, the success rate increases.

Regarding the causes of microimplant failure, Miyawaki et al9. reported that small diameter of the screw (<1.0mm), inflammation, and a high MPA are risk factors for the screw s placed in the mandibbular posterior teeth area Cheng et al10 found that the mandibular posterior teeth area and nonkeratinized mucosa are also risk factors for miniscrew failure. Additionally, Park et al11 found that mobility, right side of jaw the mandible and inflammation are among 17 clinical variables in microimplant failure.

CONCLUSION

The concept of TADs is a relatively new application of more established clinical methodologies. Although the clinician can look to the literature for answers, much is still unknown and will require future prospective basic science and clinical studies. The future development of TADs for orthodontic anchorage will establish a more complete understanding of the biology associated with both oseointegrated and nonintegrated devices.

The mini screw system used for anchorage gives the orthodontist another tool to approach a most difficult problem confronting us on a daily clinical basis.

Microimplants can provide absolute anchorage for the movement of whole dentition, as well as the movement of one or two teeth for prosthetic needs. It simplifies treatment mechanics by eliminating reactive mechanics.

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Review Article

ORAL HEALTH –AS A PRODROME OF SYSTEMIC DISEASES

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Abstract

Oral health is an essential component of health throughout life. Poor oral health and untreated oral diseases and conditions can have a significant impact on quality of life. They can affect the most basic human needs, including the ability to eat and drink, swallow, maintain proper nutrition, smile, and communicate. Oral cavity is like a gateway of our body. Not only does it predispose the body to various commensals but an insight to the early lesions displayed here can give a substantial hint about the systemic involvement of various diseases.

Key words
Caries, Oral Health, Infection

INTRODUCTION

Health is literally defined as a state of physical, mental, social and emotional well being in which the body functions with comfort, confidence, creativity and contentment eventually leading an economically productive life. In essence, health is fundamental to human progress.

Oral and dental diseases have afflicted mankind for ages Oral cavity is like a gateway of our body. Not only does it predispose the body to various commensals but an insight to the early lesions displayed here can give a substantial hint about the systemic involvement of various diseases. The overwhelming evidence now available shows that major health problems of dental origin like caries, periodontal diseases, precancerous lesions, oral and maxillofacial trauma commonly affect a large group of population. Though on one hand lack of oral health care can be attributed to lack of awareness of general people against dental well being and on the other hand to poverty, malhabits of intake of tobacco products (in various form of chewing, snuffing, smoking) unrestrained consumption of refined sugar , unattended malnourishment and faster lifestyle with reckless driving and disobey of traffic rules. In order to battle dental problems, it is essential that dental health education must be emphasised and the people must be made aware of the basics of maintainence of oral healthcare and hygiene and the factors that are responsible for tooth decay and tooth loss. Hence,the answer to solve the oral health problems of the society lies in lifestyle modification as well mental,behavioural and educational motivation of the human race.

Oral hygiene and oral diseases are one of the most common public health problems causing considerable morbidity, particularly for disadvantaged population. Good oral hygiene maintenance with proper brushing and flossing is not practised by majority of population. Rather many people use datun, household powders, detergents and tobacco etc. for cleaning teeth. These products are damaging their teeth and gums instead of taking care of oral tissues.

EPIDEMIOLOGY

Common dental ailments prevailing in the country are dental caries, bleeding gums and periodontal issues, dental flourosis and oral cancers. In has been studied that-

22.24% of 6-11yrs old have untreated primary tooth decay.

11.2 % of population is in some stage of oral or pharyngeal cancer.

More than 90% of all systemic diseases produce oral signs and
symptoms

Over 22% of adults have untreated tooth decay

According to WHO global oral health data bank – 2002

- Dental caries affects 60%-90% of school children and majority of adults
- Severe periodontitis affects 5%-15% of most of the population
- Edentulousness ranges from 6 %-78 % among countries around the world. Oral and pharyngeal cancers are related to tobacco and alcohol use.
- In India prevalence of Dental caries in the age group 12-15yrs is
- 45%-55% in UP, Delhi and Rajasthan as compared to 40%-80% in northern states.
- Oral cancer and pre-cancerous conditions is 7% in Orissa as compared to 0.3% in Delhi and prevalence of edentulous ness is19.9%.

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ORAL HEATH IN RELATION TO OTHER SYSTEMIC DISORDERS/CONDITIONS

While your eyes undeniably form the windows to the soul, your mouth, on the other hand, unquestionably is a window to your body's health. The status of your oral health can offer lots of clues about your overall health. Oral health and overall heath are intimately connected in many ways that you might ordinarily imagine.

Oral tissues are in direct physical continuity with the rest of the body. They are related with each other via blood, lymphatics and neural pathways. Furthermore , systemic influences such as endocrinal, immunological and psychological factors have an important role in the balance between oral health and diseases.

Your oral health is intimately linked to many other health conditions that extend beyond your mouth. Very often the first sign of a disease shows up in your mouth such as gum disease, can cause problem in other parts of your body. It's time that you gain more knowledge about the intimate connection that exists between the two, viz, oral health and overall health. Most infections in the mouth may provide a focus for causing distant medical problems that do not present any swelling or painful conditions and may be even difficult for the physician to detect. It might be a old filling, root canal tooth or a extraction site that may harbour bacterias and viruses that may disseminate toxins in the entire body and may concentrate in a particular organ like heart causing its dysfunction.

Here's a look at some of the diseases and conditions that may be linked to oral health

- Cardiovascular Disease

There is a evidence to show that several types of cardiovascular disease may be linked to oral health. In a recent study at Columbia university medical centre, a link was found in the levels of oral bacteria to the thickness of carotid arteries that carry blood to brain. These include heart diseases, clogged arteries, stroke and bacterial endocarditis. Some believe that bacteria from gum diseases can enter bloodstream and travel through your arteries to heart, affecting your cardiovascular system. A recent study was confirmed by the American Heart Association stating that the bacteria linked with atherosclerosis was the same that causes gum disease. It believes that there might be a link between heart disease and gum disease through high sensitive C- reactive protein. Increased amounts of C-reactive proteins is associated with increased tooth decay and gum disease. Although periodontal diseases seem to be associated with the disease, more studies are needed before the link can be confirmed with certainty. A study conducted by University of Buffalo published in the journal of periodontology has shown that periodontal disease can cause liver to produce high amount of Hs-CRP's in blood stream.

-Pregnancy and Effects on Birth

Gum disease has been linked to premature birth. Some research have shown disease causing organisms in pregnant women's mouth can wind up in the placenta or amniotic fluid, possibly causing premature birth. Unfortunately, treating periodontal disease during pregnancy may be too late, because the infection may have already spread in the woman's body. This is why it is vital to maintain excellent oral health during pregnancy. A researcher of Periodontics in Case Western Reserve University School of Dental Medicine reported the first documented case linking a mother having pregnancy associated gum disease to the death of her foetus. The bacteria from the mouth had entered the immune free amniotic fluid and were ingested by the foetus. The baby eventually died of a septic infection.

-HIV/AIDS

In some cases, one of the first sign of AIDS may appear in the mouth, with severe gum infection. Persistent white spots or unusual lesions on tongue or in mouth may also develop. Oral manifestations of AIDS include candidiasis, pneumococcal infections, histoplasmosis, ANUG, HSV Infections, Kaposi Sarcoma, Lymphomas, Recurrent Apthous Stomatitis etc

- Diabetes Mellitus

It may manifest in the form of atypical pain, dysguesia or dysesthesia. Patient is more susceptible for easy ulceration in oral mucous membrane or delayed healing of the wounds. Patients exhibits sign and symptoms of diseases like periodontitis in enhanced manner due to altered tissue response.

-Osteoporosis

The first stage of bone loss may be seen in the teeth. A dentist may be able to spot this on routine dental –X - rays. If bone loss worsens from year to year, dentist can suggest for further consultation. Also bisphosphonates used in the treatment of osteoporosis may affect the prognosis of dental treatment.

-Other conditions

•Many other conditions may make their presence known before one realise anything is wrong. These may include

•Approximately,one third of patients with vitamin B and iron deficiency anemia have chief complaint of burning sensation of tongue which can be detected by a dentist.

•Multiple myeloma- a strong suspect for chronic bone pain usually manifests in jaws only.

•Pagets disease in its osteoblastic phase by producing occlusion of bony foraminas may cause neurologic symptoms that have no explanation.

•Diabetes mellitus may manifest in the form of atypical pain, dysguesia or dysesthesia.

•Upper respiratory tract infections are always interrelated to maxillary molars and premolars as their roots are in close proximity to the lining of maxillary sinus.

•Bacterial infections like tuberculosis, syphilis, gonorrhoea may manifest as ulcers in floor of mouth, tongue etc.

MANIFESTATION OF SYSTEMIC DISEASES THROUGH THE REVIEW OF ORAL MUCOSA

Gingival hypertrophy, Petechiae,widespread ulcerations	Haematological disorders(CML,TCP, plummer Vinson syndrome), hormonal diseases,nutritional(vitamin deficiency),allergic(plasma cell gingivitis
Reddening of tongue, petechiae, Bald tongue	Vitamin deficiency disorders
Gummas, large ulcer with caseous necrosis,thrush	Bacterial and fungal infections
Ruptured bullae	Dermatological disorders(steven Johnson syndrome)
Painful ulcers inflammatory lesions	Recurrent apthous stomatitis, bechets syndrome,crohn disease, malabsorption syndrome, ulcerative colitis.
Enamel hypoplasia	Rickets, osteomalacia, malabsorption, hypoparathyroidism

ORAL HEALTH CARE POLICIES

WHO has set priorities for a coordinated effort for addressing oral disease and disparities worldwide.

WHO has developed worldwide priority action areas for oral health. First action area is centered on use of fluorides
Second action area is associated with diet, nutrition and oral health; many oral diseases are prevented by changing lifestyle

Preventing tobacco use and its cessation is third action area. WHO has also targeted both ends of age spectrum. It has also launched programme in schools.

WHO 2003 indicated that because of its high prevalence and incidence ,in almost all the regions of world, oral disease is major public health problem. Many changing oral disease patterns may be linked to changing lifestyle including dietary modifications like sugar rich diets, refined food; widespread use of tobacco and increased consumption of alcohol. Delay in seeking treatment may be attributed to structural, financial, personal and cultural barriers of the society

There is a gap between research findings of oral disease prevention, health promotion, practices and knowledge of the public and health professions. Expansion of community based disease prevention and lowering of barriers to personal oral health care are needed to meet the needs of the population.

The burden of oral diseases and needs of population are in a transition and oral health systems and scientific knowledge are changing rapidly. In order to meet these challenges effectively public health care administrators and decision – makers need the tools, capacity and information to assess and monitor health needs. They have to choose intervention strategies, design policy options appropriate to their own circumstances and to improve the performance of oral health system

CONCLUSION

Your mouth usually harbours millions of commensals in the form of microorganisms. Usually you can keep these bacteria under control with good oral health care, such as brushing twice daily and flossing once at night.Even among the educated class brushing at night and floss is practised rarely. Saliva is also a key defence against microorganisms causing dental decay. It contains vital enzymes and immunoglobulins that destroy harmful bacteria and prevent dental decay.

Gum disease can let germs enter your bloodstream and wreak havoc elsewhere in your body. Sometimes invasive dental treatments can also allow bacteria to enter you bloodstream. And medication or treatments that reduce saliva flow or disrupt the normal balance of bacteria in your mouth also lead to oral changes, making it easier for bacteria to enter systemically

Almost all oral diseases can be prevented and oral health is a part and partial of overall health care system. A basic knowledge of oral diseases must be compulsory to all medical professionals. There must be a national oral health policy to take care of dental and oral health of masses at urban as well as rural basis.

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Review Article

CONTEMPORARY IMPRESSION TECHNIQUES IN IMPLANT PROSTHODONTICS

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Abstract

The objective of an impression making in implant dentistry is to accurately relate the implant analogue or implant abutment analogue to the other related structures in the dental arch. This is influenced by use of an impression transfer coping which is attached to the implant or implant abutment. With appropriate technique selection and manipulation, accurate impressions can be obtained by the contemporary restorative dentist for fabrication of implant-supported restorations. This article critically outlines the clinical efficacy of impression techniques used in implant dentistry.

Key words
Impression Techniques, Implants, Transfer, Coping, Pick Up

INTRODUCTION

Simulating the working conditions in the mouth to a laboratory setting for implant dentistry is technique sensitive but critical to the success of implant therapy. The literature is rife with articles on the pros and cons of various impression techniques, impression materials, impression trays etc. The aim of this article is to describe and evaluate the clinical efficacy of impression techniques in implant therapy for transferring information to the laboratory.

Transfer of abutment position

1.Direct Conventional impression

Direct conventional impressions made by clinicians for crown and bridge work with retraction cords can be used for implant therapy as well.

Advantages and disadvantages

The obvious advantages being the familiarity and ease of the technique. These impressions can be taken for multiple units and full mouth restorations as well. The size and shape of the abutment can be modified and soft tissue anatomy is reproduced well.

The disadvantages are the use of local anaesthesia for the placement of retraction cords.

2.Transfer type impression (Abutment transfer)

This technique requires making impression of an abutment using Abutment Impression Copings. To create a restoration for an abutment, the laboratory model needs to include an abutment replica.The coping is picked up with the impression and the suitable abutment is placed in the coping and the technician fabricates the prosthesis. Abutments have to be fitted onto the coping and errors can be introduced at this stage.

Transfer of implant position to the lab

1.Implant-level direct transfers for open-tray, pick-up impression technique

Designed to transfer the soft tissue profile as well as the implant's position and hex orientation. This transfer procedure requires a custom tray or modified stock tray with screw access holes in the areas occlusal to the implants. The transfer coping is screwed onto the implant body and sticks out of the impression. The central transfer screw must be removed before the impression can be released from the mouth. Unlike the Indirect technique, direct transfers are held firmly within the open-tray impression as it is removed from the mouth. The Implant analog is connected to the transfer coping embedded within the impression, the impression is poured in dental stone to fabricate a working cast containing a replica of the implant in the patient's mouth.

Advantages and disadvantages

This technique allows direct access to the screws that hold the transfer copings correctly positioned against each implant.

The principal advantage of this technique is that the transfer coping remains in the impression and the inaccuracies of transferring are avoided.

When multiple implants are present and there is a non-parallel configuration this technique is ideal as one the impression is easily retrievable and secondly there is minimum distortion of impression material.

Disadvantages:

More parts to manipulate in fastening, some horizontal range of fastening, blind fastening of

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analog (1). These listed disadvantages may not be so in the hands of well trained clinicians
A custom tray with access to the impression coping screws is required or a metal tray with windows is needed.

2.Implant-level indirect transfers for closed-tray, transfer impression technique
Designed to transfer the soft tissue profile as well as the implant's position and hex orientation, Indirect Transfers remain attached to the implants when the closed-tray impression is removed from the mouth. The transfer copings with this technique are parallel sided or slightly tapered for ease of removal of impression. The transfer is then retrieved from the implant, mated to the corresponding Implant Analog, and placed into its corresponding impression hole. To fabricate a working cast containing a replica of the implant in the patient's mouth, the impression is poured in dental stone.

Advantages and disadvantages
Advantages are that local anaesthesia and custom trays are not required. Additionally when there is limited opening they can be used as there may not be sufficient space for access to the screws retaining pick up type impression. Patients with gag reflex when the impression has to be removed quickly (2). This is controversial the setting time of a polyvinyl siloxane impression material itself is approximately four minutes which is enough to induce a gag reflex.

The disadvantage is the lack of predictability with the possibility of coping dislodgement during impression making. Additionally abutments have to be fitted onto the copings and errors maybe introduced at this stage. Further soft tissue anatomy transfer is not very accurate and the size and shape of the abutment cannot be modified. Sometimes it is very difficult to remove the impressions from the mouth of the patient.

Accuracy of transfer

A number of factors determine the accuracy of an impression.

Number of implants - Impression making for Single implants is technically less demanding than multiple implants. For single tooth implant Daoudi MF et al found that positional errors in the restorative stages are unlikely to affect passive fit with the implant but rotational or dimensional discrepancy in the impression is likely to affect the appearance, contact points and occlusal requirements(3). Their study used only one system (Nobel pharma) which is a limitation additionally they did not consider component tolerances.

Position of implants - parallel implants will limit the distortion in the impression. Carr AB found the direct transfer method to provide the most accurate working cast additionally he attributed the inaccuracy of the indirect method to nonparallel abutment relationship and deformation of impression material (1). His study however did not evaluate the inaccuracy for single tooth implants.

Impression material - When implants copings have undercuts a material with good flexure strength is needed. Vinyl polysiloxane is best suited for the same.

Type of impression tray - Carotte et al in their study found that metal and rigid plastic trays gave greater accuracy of impressions than flexible plastic ones(4). Though their study was directed to conventional crown and bridge prosthesis, the principle for implant dentistry prosthodontics remains the same.

Splinting transfer copings - **Assif D et** al in their study found that splinting the transfer copings with Duralay resulted in more accurate impressions(5). **Daoudi MF** arrived at the same conclusion in their study. Both studies were however limited by the fact that was based on only one system (Nobelpharma).

Clinician training - Clinician errors could be attributed to lack of formal training, limited understanding of the techniques involved.

Clinical applications

Errors in impression making for implant prosthesis can severely compromise the final prosthesis. These errors are more obvious when compared to conventional fixed prosthodontics due to the precise machine fit of implant components and to the rigid connection of implant to bone (2). The selection of the impression technique and henceforth the tray depends upon the coping design. A square coping requires an open tray and the technique is therefore the direct technique. A tapered coping facilitates the use of a closed tray or indirect technique.

Multiple implants bring along with them the problem of non-parallelism and the use of the indirect technique has shown to cause errors in the fitting of the framework. Bone loss and even loss of integration has been attributed to this misfit (2). Pressure on the abutments causing them to tilt or splay apart causes the rigid implant body in the bone to be subject to stress.

To increase the accuracy of the impression technique for multiple implants using the direct technique the direct transfers are connected with acrylic. The shrinkage of acrylic however can introduce errors by causing the implants to move closer.

The literature seems to be having inconsistencies in the acceptance of a superior technique. Further studies with a spread of different implant systems for both multiple units and single tooth implants is required to identify the better technique for different clinical scenarios faced by the implantologist.

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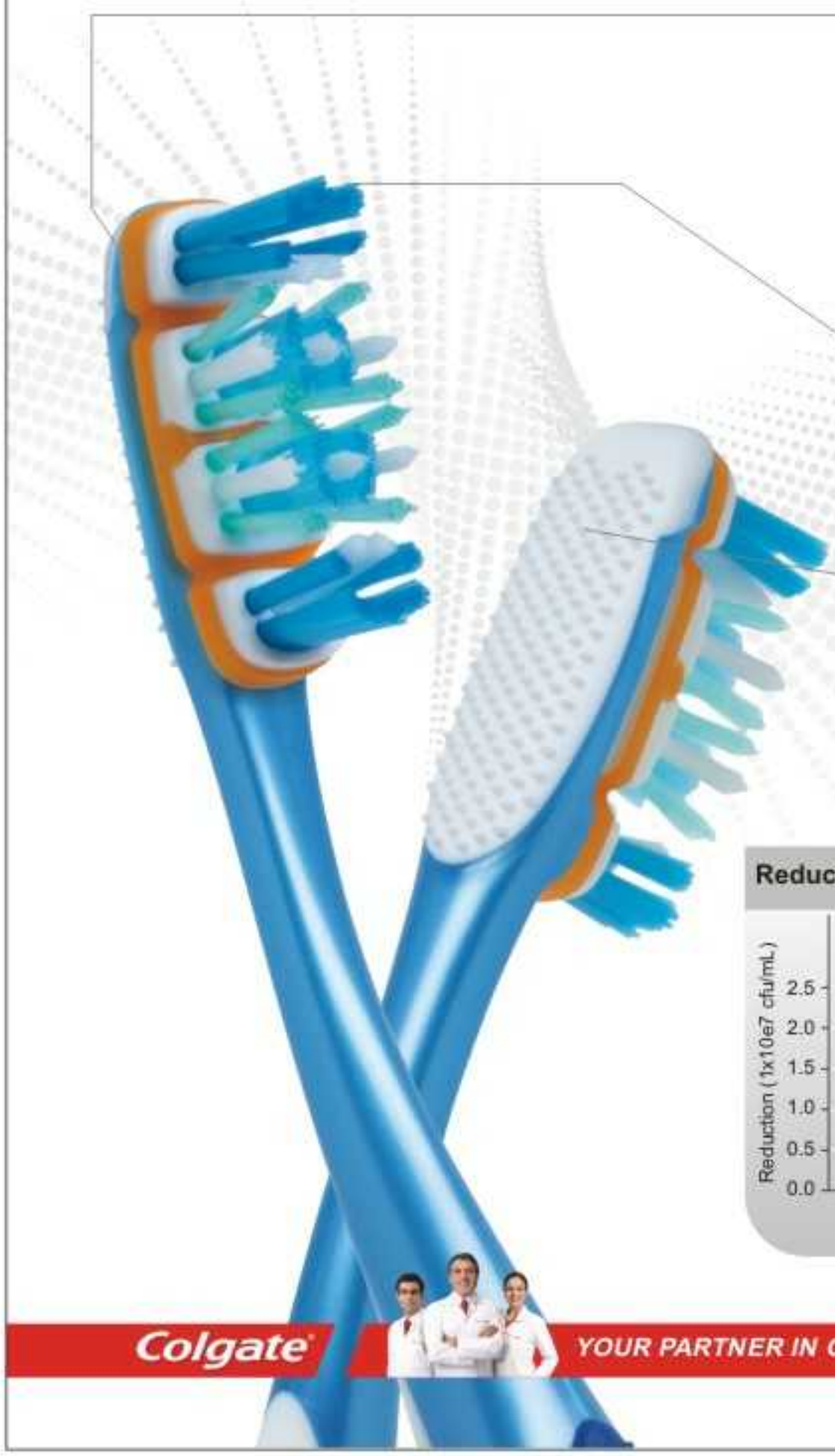

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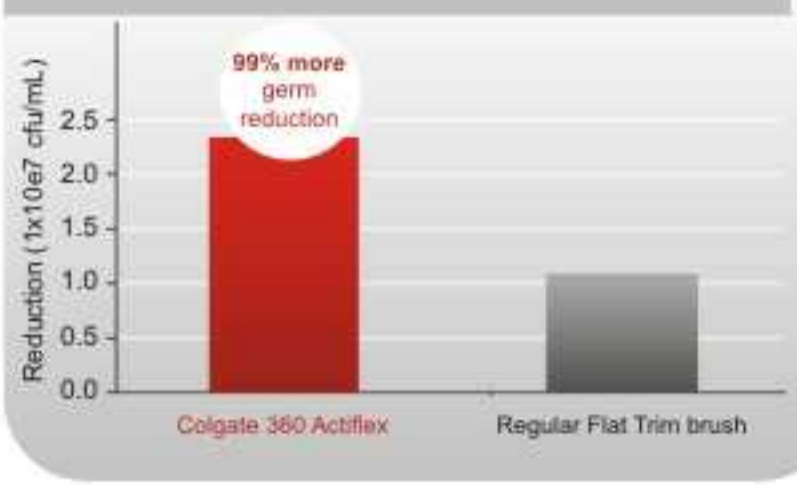

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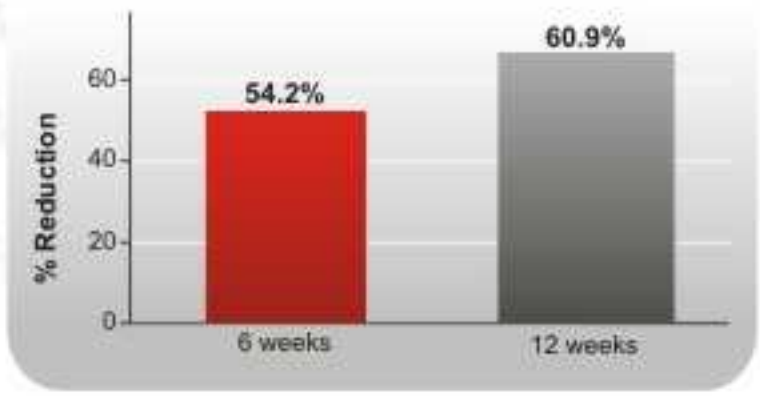

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