

Orthodontic Management Of The Maxillary Impacted Canines- A Review

Abstract

The aims of the present review study was to see the contribution of the maxillary permanent canine to the upper face and sense it's importance. Study the etiology behind its impaction, incidence, functional importance of canine, problems encountered during orthodontic tooth movements, risks of impacted tooth movement, and various traction techniques employed. The study also included, how to radiographically evaluate the impacted teeth and classify the impaction, and hence forth formulate a proper treatment plan for it's dis-impaction.

Key Words

Impaction, Disarticulation, Lateral excursion, Panoramic radiograph, Lateral oblique radiograph, Ankylosis, Soft tissue dehiscence, Attached gingival, Trajectory, Maxillary hypoplasia, Facial stenosis, Pseudopognathism, Ectopic follicle, Root resorption, Cysts and tumors, Periodontal membrane's integrity, Cementoenamel junction.

Introduction:

One must look at the contribution of the maxillary permanent canine to the upper face to sense its importance. It stands at the corner of the dental arch, forming the canine eminence for support of the alar base and upper lip. Functionally, It supports the dentition, contributing to it's disarticulation in lateral excursion.

Its root length, and particularly its volume, makes it one of the most outstanding abutments for prosthetic replacement of other maxillary teeth.

The impaction of teeth can be any tooth in the oral cavity with the possible exception of the mandibular incisors and the first molars. Third molars 98%, Maxillary cuspids 1.3%, Mandibular first premolars 0.22%, Mandibular second premolars 0.11%.

Risks Of Impacted Tooth Movement

1. Infection
2. Ankylosis
3. Soft tissue dehiscence
4. Lack of attached gingiva
5. Possibility of extrusion of impacted tooth due to high force application.

Aetiology

A) Path of eruption : The length of travel of the canine from its developmental bed to its eruption is the longest. If on its course, subtle skeletal, dental or functional influences affect its trajectory, impaction is likely to occur.

B) Diminished skeletal growth of the

maxilla : Extreme maxillary hypoplasia, such as facial stenosis or any of the facial clefts, obviously affects skeletal size of the maxilla. In these cases pseudopognathism of the mandible results as well as impaction of the maxillary canine.

C) Ectopic follicle : The ectopic follicle is affected by many other factors as well as strong hereditary predisposition.

D) Arch length shortage : The maxillary arch size-tooth mass discrepancy is most likely to affect the maxillary canine, because the canine erupts as the final tooth with in the arch.

E) Faulty root resorption : There is tremendous variability of the angle of incidence b/w permanent canine cusp tip and the root end of the primary canine. If the primary-permanent rendezvous is not proper, faulty root resorption and deflection of permanent canine can occur.

F) Decrease in the length of the dental arch by attrition as the patient matures.

G) Low correlation between maxillofacial skeletal growth and impacted tooth maturation.

H) Large tooth size.

I) Cysts and tumors.

J) Persistent deciduous teeth.

K) Supernumerary tooth.

L) Bone diseases.

M) Crowding.

Various Classifications Of Canine Impaction

¹ Manish Goyal

¹ Reader, Department of Orthodontics, Desh Bhagat Dental Collage & Hospital, Muktsar.

Address For Correspondence:

Dr. MANISH GOYAL (M.D.S, MOrth RCSEd (U.K))
Reader, Department of Orthodontics,
Desh Bhagat Dental Collage & Hospital, Muktsar

ADDRESS :- H.No# 63, Phase II,
Model Town, Bathinda, Punjab.
E-Mail : manishortho@yahoo.com

Date of Submission : 12th February 2011

Date of Acceptance : 16th June 2011

1.The canine angulation to the mid line.

- The mid line is located and second line made through the canine root apex tip. The angle b/w the two lines is graded:
- Grade 1: 0-15 degree.
- Grade 2: 16-30 degree.
- Grade 3: greater than 31 degree

2.Vertical height of canine crown

- Grade 1: Below the level of the CEJ
- Grade 2: Above the CEJ
- Grade 3: More than half way up the root, but less than the full root length.
- Grade 4: Above the full length of the root.

3.Canine overlap the adjacent incisor root.

- Regarding the adjacent incisor root.
- Grade 1: No horizontal overlap.
- Grade 2: Less than half the root width.
- Grade 3: More than half, but less than the entire root width.
- Grade 4: Complete overlap of the root width or more.

Radiographic Evaluation Of Impacted Teeth.

- The radiograph must have the following to be a diagnostic radiograph:
- 1) The entire outline of impacted tooth or teeth.
- 2) Must show the vital structures that are in close proximity to the impacted tooth.
- 3) At least 2mm should show around the impacted tooth.

The type of radiographs that can be used to identify impaction

1. Periapical radiograph.
2. Occlusal radiograph.
3. Panoramic radiograph.
4. Lateral oblique radiograph.
5. Lateral cephalometric radiograph.
6. CT scan

Types Of Traction Techniques

1. Cementation of a metal or plastic crown. : Crown cementation on the exposed tooth requires removal of considerable amounts of bone and soft tissue, and its placement may be difficult due to the position of the tooth.

2. Eyelets in amalgam. : Early forms of traction included eyelets inserted into amalgam fillings of the impacted tooth, or pins were embedded in the tooth. Threaded pins required drilling through the enamel and an ultimate restoration. This is deemed to be an unacceptable procedure in most of the cases.

3. Lasso technique. : In this technique ligation of a wire around the cervical region of the tooth is done at the time of surgery. This approach requires channeling and removal of a large amount of bone, and may be damaging to adjacent tooth and tissues. Moreover this can result in severe resorption at the cemento-enamel junction.

4. Magnetic traction. : Here the magnetized canine is erupted after surgery, without patient discomfort and with satisfactory healing of the surrounding tissues.

The attached magnets are then removed, a button or bracket is bonded to the buccal surface of the canine, and the tooth is moved into the arch using a conventional preadjusted edgewise appliance

5. Bonding. : Currently the most common procedure is bonding of an attachment directly to the enamel surface of the impacted tooth at the time of surgery.

A curved base bracket is used, with a soft wire ligated to the attachment before bonding. The wire protrudes through the palatal tissue with a pig tail hook for attachment of the elastic.

The oral surgeon should expose enough of the canine to prevent the infiltration of the granulation tissue, but the position of the canine will determine whether the orthodontist can isolate, etch, and bond with a conventional composite resin. Most of the tough impactions are up far enough, that bonding is rendered rather difficult by the proximity of the adjacent tissues and the lack of really good moisture control.

There are a number of things to cope up with this problem e.g. bone wax, local hemostats

and short term hot air application to the area.

The Treatment Plan Should Be As Follows:

1. Extract the upper central incisor.
2. Start forced eruption of the canine into this extraction space.
3. Level both the arches.
4. Build up the ectopic canine to resemble central incisor.
5. Retention with Hawleys plate.

When considering canines as replacements for upper central incisor the following criteria should be evaluated:

- 1) Angulation and torque of this canine.
- 2) Gingival contour, color, and morphology of the canine.
- 3) Possibility of acceptable recontouring of the canine to avoid premature contact with the opposing teeth and for esthetic reasons.

Discussion

Palatally erupting maxillary ectopic canines often require orthodontic traction to assist their eruption into functional occlusion. A correct diagnosis of the impacted tooth's location angulation along with its surrounding teeth and obstacles, is necessary to determine the optimal treatment. In most orthodontic techniques used to move impacted canines into the arch, the force usually comes from the archwire and is directed labially. After removal of the fixed appliance some gingival recession could be seen around the canine, probably due to the heavy elastic traction. When a labially impacted or unerupted cuspid has its crown surgically exposed, there will be a tendency for that tooth to eventually have a longer clinical crown.

The length of the clinical crown is due to the following conditions:

- A) First and foremost is the condition of the attachment on the unerupted tooth. Many of these impacted teeth have very large follicles which extend below the normal clinical crown, hence there is never "normal" attachment to begin with.
- B) Secondly, the surgical exposure itself must be generous, but at the same time observing the periodontal membrane's

integrity. If this is not observed longer clinical crown length will result.

- C) Last but not the least, the type of attachment that is placed on the crown has a lot to do with periodontal status.

This is why many orthodontists oppose to the use of wiring the tooth cervically, which is certainly a potential for stripping periodontal attachment.

Conclusion

- The impacted canine is not to be regarded lightly and yet, not to be feared.
- Accurate diagnosis is important; adequate uncovering and mechanical assistance to eruption is critical.
- Proper finishing and retention is more critical than in our other orthodontic cases as a whole.
- By proper execution of treatment planning, the orthodontist can save many months of frustration and anxiety.

Bibliography

1. Mcnamara C.M.: Orthodontic Management Of An Impacted Maxillary Canine With An Abnormal Premolar Root: J.C.O. 2000; 34(12): 709-711.
2. Visessaksanti U. : An Easy Method Of Checking Archform And Canine Width: J.C.O. 1998; 32(10): 608-610.
3. Miller R.A.: A Light-Cured Hybrid Compomer For Bonding To Impacted Canines: J.C.O. 1996; 30(6): 331-333.
4. Rinchuse D.J.: Clinical Aid Facially Bonded Lingual Cleat For Extrusion Of An Ectopic Canine: J.C.O. 1995; 29(09): 579-579.
5. Weaver B, Hornbrook R And Ngan P.: Early Timely Management of Ectopically Erupting Maxillary Canines: Seminars In Orthodontics. 2005; 11(3): 152-163.
6. Aghaloo T, Felsenfeld, A.L.: Surgical Exposure of Impacted Teeth : Oral & Maxillofacial Surgery Clinics Of North America. 2002; 14(2): 187-199.
7. Glover K.E, Heo G And Stewart J.A.: Factors That Relate To Treatment Duration For Patients With Palatally Impacted Maxillary Canines: Am J Orthod. 2001; 119(3): 216-225.

Source of Support : Nil, Conflict of Interest : None declared