Indian Journal of Dental Sciences.
September 2012 Issue:3, Vol.:4

www.ijds.in

Case Report

Indian Journal
of Dental Sciences

E ISSN NO. 2231-2293 P ISSN NO. 0976-4003

Importance of Genioplasty- A Case Report

[1] (Major) Narinder Pahwa
[2] Munish Reddy
[3] Vishal Pahwa
[4] Sunanda Roy Choudhary
[5] Nitin Gupta
[6] Pradeep Raghav

[1] Senior Lecturer, Department of Orthodontics, S.B.B. Dental College, Ghaziabad, India.
[2] Professor, Department of Orthodontics, Subharti Dental College, Meerut, India.
[3] Dentist. Melbourne, Australia.
[4] Professor and Head, Dept of Orthodontics, S.B.B Dental College, Ghaziabad, India.
[5] Registrar, Dept of Oral & Maxillofacial Pathology, Indra Gandhi Govt. Dental College, Jammu
[6] MDS, Dept of Ortho, Subharti Dental College,Meerut ,UP

Address For Correspondence:
Dr (Major) Narinder Pahwa.
Wz 22 A/4, Street No-8, Krishna Park,
Tilak Nagar, New Delhi-110018, India.
Phone No: 09958662844,
E Mail Address: docnarenderpahwa@gmail.com

Submission : 04th October 2011
Accepted : 28th June 2012

Quick Response Code

Abstract
Class II skeletal malocclusions are frequently accompanied by a retruded chin. Treatment of such cases is very challenging for the orthodontists. Firstly, the underlying skeletal malocclusion has to be corrected with functional appliances in patients with growth potential followed by fixed appliance orthodontic treatment and Genioplasty to achieve a pleasing profile. Genioplasty procedures are most often performed in addition to orthodontic treatment to attain optimal esthetics.The following case was treated with Twin Block appliance therapy followed by fixed orthodontic appliances. However, this treatment alone did not result in optimal facial esthetics. Therefore, it was decided to perform Genioplasty to improve esthetics. This resulted in marked improvement in the facial appearance of the patient. It can therefore be emphasized that without Genioplasty optimal esthetics will be difficult to achieve in cases with retruded chin.

Key Words
Skeletal Class II, Twin Block, Genioplasty

Introduction

All Class II malocclusions require a treatment regimen uniquely designed for the individual patient. Careful diagnosis helps reveal subtle discrepancies that may require alterations in the treatment plan. A patient's growth potential is an important consideration for successful orthodontic correction of a Class II skeletodental pattern. More precisely, it is amount and direction of facial skeletal growth that greatly facilitates correction during orthodontic therapy[1]. Class II malocclusions are often accompanied by a retruded chin. Although the chin is a prominent feature of a face, it has no clearly defined function. The chin, however, forms an integral part of the total facial esthetics and any deformity of the chin will disturb the balance and harmony between the various facialcomponents. The chin is often subconsciously associated with "character" or "personality. A retruded oval shaped chin is generally regarded as a sign associated withfemininity, while a strong, square chin with masculinity[2,3]. Genioplasty procedures are most often

Fig 1. Pre-treatment Photographs

Fig 2. Pretreatment Radiographs

performed as part of the orthognathic surgical correction of dentofacial deformities. The following case report will illustratethe treatment of an exigent skeletal Class II Div I Malocclusion with Deficient Chin.

Diagnosis And Etiology

V.K,a 15- years-old male, presented with a chief complaint of forwardly placed upper front teeth. His medical history showed no contradiction to orthodontic therapy and no history of trauma and serious illness. He had class II malocclusion with Convex profile, Steep FMA, incompetent lips with interlabial gap of 6mm, incisal display during speech was 6mm and during smile was 8

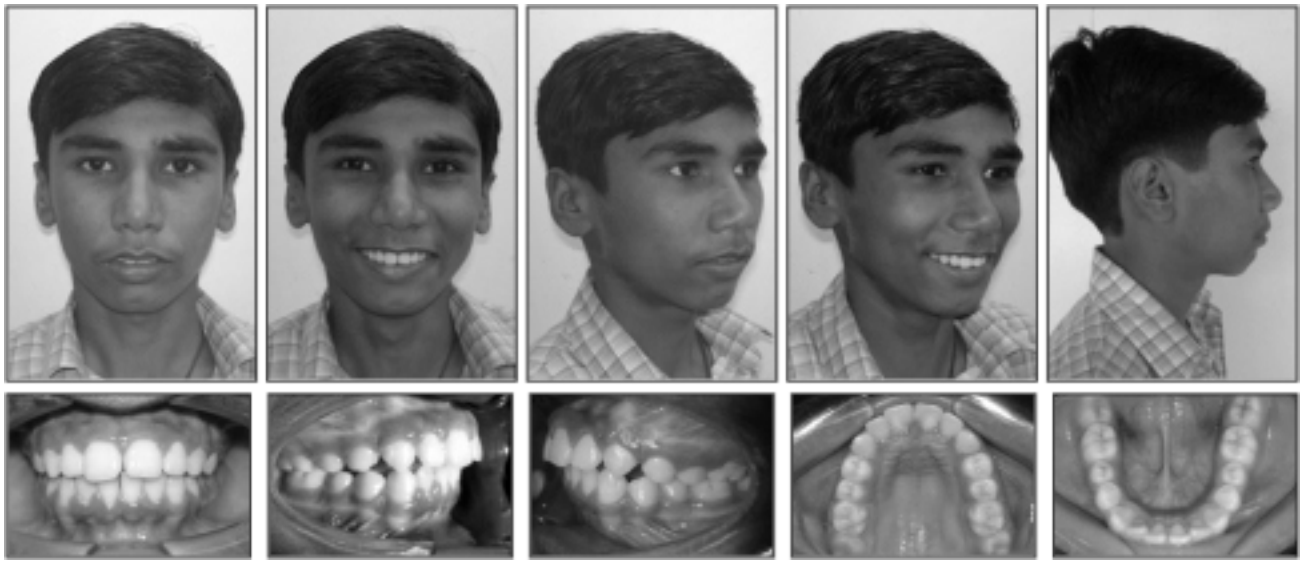

Fig 3. At the end of Twin Block Myofunctional appliance therapy

mm, acute nasolabial angle, deficient chin and shallow mentolabial sulcus **(Fig.1)**. Incisor relationshipwas Class II, Overjet was 8 mm, Overbite 3mm (43%), centerlines were coinciding, and left and right buccal segment relationship wasend on molar relation. He had orthognathic maxilla, retrognathic mandible, deficient chin, vertical growth pattern, proclined upper and lower incisors, incompetent lips and protrusive upper and lower lips **(Table-1)**. Pre-treatment OPG and Lateral Cephalogramshowed Cervical vertebrae maturation status to be CVS - 3 **(Fig. 2)**.

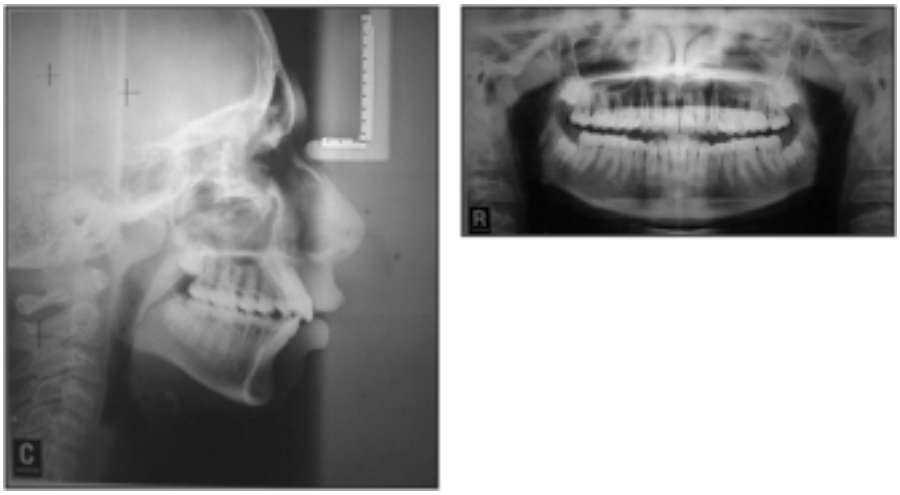

Fig 4. Radiographs taken at the end of treatment with Twin Block appliance.

Treatment Objectives

1. Correction of skeletal jaw disharmony
2. Correction of proclination of upper anterior teeth

Table 1: Pretreatment Cephalometric Analysis

Variable	Pretreatment	Normal
SNA	80degrees	82± 2 degrees
SNB	73 degrees	80±2 degrees
ANB	7degrees	2±2 degrees
N PER to Pt. A	-6 mm	0-1 mm
N PER to Pog	-24 mm	±2 mm
Go Gn to SN	34degrees	32±2 degrees
Angle of Inclination	83.5 degrees	86 degrees
LAFH	64 mm	65.5 mm
Eff Maxillary length	93mm	93.6 mm
Eff Mandibular length	111mm	117.5 mm
Y axis	73 degrees	69 degrees
U 1 to NA(angle)	30 degrees	22 degrees
U 1 to NA(linear)	7.5 mm	4 mm
U 1 to SN (angle)	111 degrees	102 degrees
L1 to NB	25 degrees	25 degrees
L1 to NB	8 mm	4 mm
L1 to A-Pg (line mm)	3 mm	1 ±2 mm
L 1 to Md PLANE	93 degrees	90 degrees
'S' line	Upper lip protrusive by 5 mm. lower lip protrusive by 4 mm.	Upper lip-2mm. lower lip 0 mm.
Naso labial angle	96 degrees	90-110 degrees

Table II: Comparison Pre and End of Twin Block treatment Cephalometric Analysis findings.

	Pretreatment	End of Twin Block Treatment
SNA	80degrees	80 degrees
SNB	73 degrees	73 degrees
ANB	7degrees	7 degrees
N PER to Pt. A	-6 mm	-5.5mm
N PER to Pog	-24 mm	-17 mm
Go Gn to SN	34degrees	36 degrees
Angle of Inclination	83.5 degrees	86 degrees
LAFH	64 mm (65.5)	68.5 mm
Eff Maxillary length	93mm (93.6)	97 mm
Eff. Mandibular length	111mm (117.5)	116 mm
Y axis	73 degrees	69 degrees
U 1 to NA(angle)	30 degrees	19 degrees
U 1 to NA(linear)	7.5 mm	3 mm
U 1 to SN (angle)	111 degrees	105.5 degrees
L1 to NB	25 degrees	31 degrees
L1 to NB	8 mm	10 mm
L1 to A-Pg (line mm)	3 mm	3 mm
L 1 to Md PLANE	93 degrees	101 degrees
S LINE U	5 mm	3 mm
S LINE L	4 mm	2 mm

Table III: Comparison Pre and Post- treatment Cephalometric Analysis findings.

	Pretreatment	Postreatment
SNA	80degrees	80 degrees
SNB	73 degrees	73 degrees
ANB	7degrees	7 degrees
N PER to Pt. A	-6 mm	5.5 mm
N PER to Pog	-24 mm	-9 mm
Go Gn to SN	34degrees	31 degrees
Angle of Inclination	83.5 degrees	83.5 degrees
LAFH	64 mm (65.5)	67 mm
Eff Maxillary length	93mm (93.6)	97 mm
Eff. Mandibular length	111mm (117.5)	120 mm
Y axis	73 degrees	67.5 degrees
U 1 to NA(angle)	30 degrees	18 degrees
U 1 to NA(linear)	7.5 mm	3 mm
U 1 to SN (angle)	111 degrees	105 degrees
L1 to NB	25 degrees	31 degrees
L1 to NB	8 mm	10 mm
L1 to A-Pg (line mm)	3 mm	2 mm
L 1 to Md PLANE	93 degrees	101 degrees
S LINE U	5 mm	2.5 mm
S LINE L	4 mm	1.5mm

3. Correction of rotations
4. Correction of deep bite
5. To obtain ideal over jet
6. Achieve class I molar and canine relation

Treatment Plan

Twin block appliance will be given to correct Saggitalmaxillo-mandibular and class II molar relationship. Retention will be provided by fixed Rickenator. Leveling and alignment of both the arches and detailing of occlusion will be done by Preadjusted edgewise appliance Roth prescription 0.022 slot. Final step would be Genioplasty for deficient chin.

Treatment

Twin block myofunctional appliance was given at the beginning of treatment and molar and canine relation was corrected to Class I. Roth appliance 022 slot was placed after twin block therapy. Leveling and alignment were begun with a 0.014-in nickel-titanium archwire and completed with a 0.016 × 0.022-in stainless steel wire.Final detailing was completedwith 0.018 × 0.025-in stainless steel archwires. Finally sliding Genioplasty to advance the chin by 10 mm was done to correct the deficient chin. Total time taken during treatment was33 months.

Treatment Results

Post myofunctional therapy (Fig. 3) following improvements were observed

1. N per to Pog reduced by 7 mm.
2. Lower anterior facial height increased by 4.5 mm
3. Maxillary length increased by 4mm and mandibular by 5mm as the patient was in active growing phase
4. Proclination of upper incisor decreased by 11 degrees
5. Proclination of lower incisors increased by 6 degrees

Pre- finishing Cephalometric Analysis (Fig. 4) showed

1. The axial inclination of maxillary incisors showed proclination.
2. Upper and lower lip moved backward in relation to the S line.

Post Genioplasty (Table. 3) following improvements were observed (Fig. 6)

1. N per to Pog reduced by 10 mm post myofunctional therapy.
2. Lower incisor to A-Pog decreased by 1 mm
3. S line to upper lip and Sline to lower lip reduced by 0.5mm
4. Y axis reducer by 1.5 degrees
5. Go-Gn to Sn decreased by 5 degrees

Post-Treatment assessment **(Fig. 5, 6)** showedgood facial improvement at the end of the treatment. The convexity of the profile reduced.Deficient chin was corrected by Genioplasty which resulted in a good facial profile **(Fig.7, 8)**. Upper and lower lips became less prominent. Class I molar and canine relation was achieved. All the roots were parallel. Midlines were coinciding. No complications were encountered during treatment. Patient is currently in retention phase and long term follow up is required to ascertain the stability of achieved results.

Discussion:

Functional appliance therapy can reduce the severity of a Class II skeletal pattern, there is about a 75% chance of improvement in the jaw relationship. [4] Twin Blocks appliance was selected for treatment because the case presented with Angle's Class II division I malocclusion with good arch form, uncrowded and aligned lower and upper arches, an over jet of 9 mm and a deep overbite, on clinical examination the profile improved when mandible brought forward and the patient was in active growth phase.[5] After the treatment with Twin Blocks was over the occlusion improved from a end on molar relation to Angle's Class I molar and canine relation. However, the ANB angle did not change which can be attributed to the downwards and backward rotation of the

Fig 5. Photographs taken 10 months after Genioplasty and debonding.

Fig 6. Post treatment Radiographs (10 months after debonding).

mandible which resulted from opening of the bite which was done to correct deep bite. This reinforces the fact that skeletal change with twin block appliance is not clinically significant, but the twin-block appliance is effective in reducing the overjet and the severity of malocclusion.[6] Also, the chin appeared to be deficient. At first glance surgical intervention to add to the chin will not seem conservative however; this surgical procedure can be used in some borderline patients to make nonextraction treatment feasible. Genioplasty is a realistic esthetic alternative to repositioning the entire jaw and, if the occlusion is satisfactory, it then can be a considerably more benign procedure than mobilization of the entire

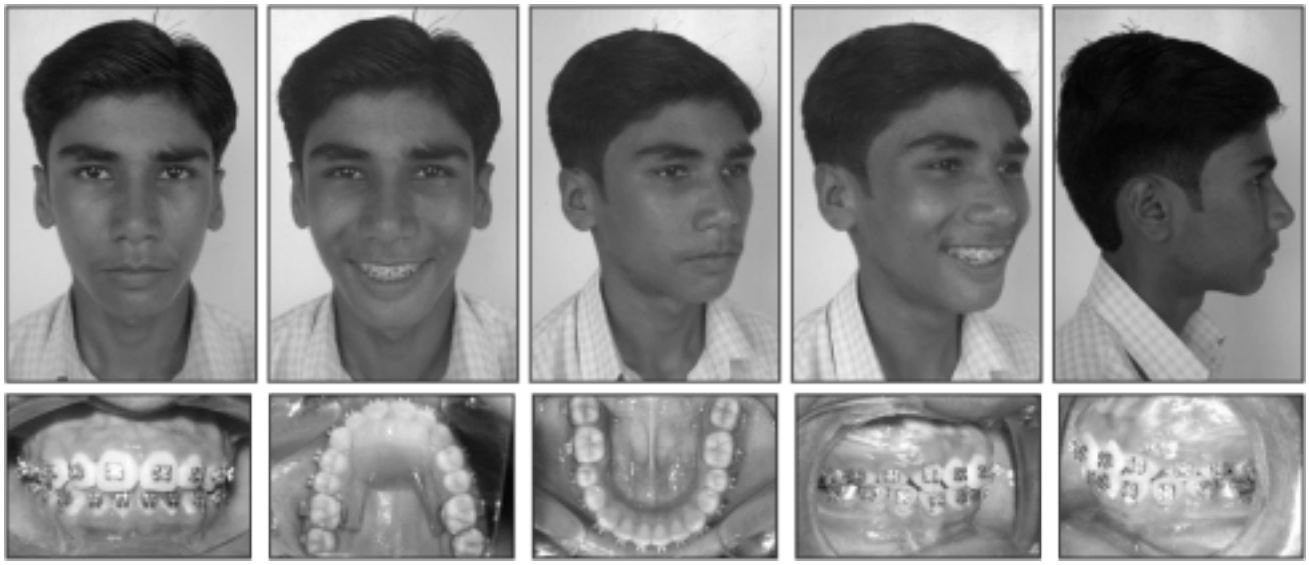

Fig 7. Photographs after Genioplasty.

Fig 8. Radiographs after Genioplasty.

mandible or maxilla.[7] Therefore to correct the chin deficiency Genioplasty was done to improve the profile of the patient and the chin was advanced upwards and forwards by 10 mm. This resulted in improved facial appearance of the patient. Ten months after Genioplasty was done the profile changes appeared to be stable. Problems such as gingival recession and paresthesia[6] which are frequently associated with Genioplasty were not observed in the patient.

Conclusion:

Genioplastyis an important procedure in conjunction with orthodontic treatment in patients with deficient chin after correction of skeletal Class II with functional appliances and it allows the orthodontist to overcome vexing problems of facial esthetics and stability. Such cases need to be identified by the general dentist and the patients guided and motivated accordingly because most of the times it is the general dentist who is the first one to be consulted by the patient.

REFERENCES:

1. Ernest A. M. Treatment of a Class II, Division 1 vertical growth pattern with severe anterior crowding. Am J Orthod Dentofacial Orthop 1997 Sep; 300 - 308.
2. Dion KE, Berschied E, Walster E. What is beautiful is good. J Pers Psycol.1972, 24:285.
3. Kalik M.S. Towards an interdisciplinary psychology of appearance. Psychiatry1977, 41:243.
4. Tulloch J. F. C, Phillips C, Koch G, and Proffit W. R. The effect of early intervention on skeletal pattern in Class II malocclusion: A randomized clinical trial. Am J Orthod Dentofacial Orthop 1997 Apr; 391 - 400
5. William J. C. Twin Block functional therapy. 2002; 2nd edition; 12; Mosby.
6. O'Brien K, Wright J, Conboy F, et al. Effectiveness of early orthodontic treatment with the twin-block appliance: a multicenter, randomized, controlled trial. Part 1: dental and skeletal effects. Am J Orthod Dentofacial Orthop 2003; 124:234-243
7. Proffit W. R, Turvey T. A., and Moriarty J. D. Augmentation Genioplasty as an adjunct to conservative orthodontic treatment Am J Orthod Dentofacial Orthop 1981 May; 473 - 491.

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