



Full Length Case Report

A CORRECTIVE APPROACH IN THE TREATMENT OF TRAUMATIC DEEP BITE IN A PAEDIATRIC PATIENT WITH EXARTICULATION OF MAXILLARY LATERAL INCISOR

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ABSTRACT

Aesthetic impairment and trauma to the palatal or lower labial gingivae are frequently reported by persons with the problem of Deep Bite. Extremely deep overbite can be associated with damage to the periodontium on the lingual surface of the maxillary incisors. Removable biteplate appliances to reduce the overbite can be used for children who have less than normal eruption of the posterior teeth and reduced facial height. An anterior biteplate is incorporated into a removable appliance so that the mandibular incisors occlude with the plastic plane lingual to the maxillary incisors. This prevents the posterior teeth from occluding and encourages their eruption. The appliance must be worn full-time during this phase of treatment. Once the proper vertical dimension has been established, the bite plane must continue to be worn at night as a retainer, or the anterior teeth will erupt and the deep bite will return.

Key words: Deep bite, Facial height, Bite plane.

INTRODUCTION

Orthodontics- the branch of dentistry concerned with the growth of the jaws and face, also involves treatment of the teeth and jaws when they are irregular or bite in an abnormal way or both (Millett *et al.*, 2006). The reasons for teeth not biting together correctly may include the position of the teeth, jaws, lips, tongue and/or cheeks or may be due to a habit e.g. thumb sucking or the way people breathe (Shaw *et al.*, 1991). Ideally the lower front teeth bite in the middle of the back surface of the upper front teeth. When the lower front teeth bite further behind the upper front teeth than ideal, this is known as deep bite (Shaw *et al.*, 1980). Graber has defined deep bite as a condition of excessive overbite, where the vertical measurement between the maxillary and mandibular incisal margins is excessive when the mandible is brought into habitual or centric occlusion (Graber, 1988). Depending on the definition of "increased," the reported prevalence of deep bite ranges from 11.8% (Nanda, 1997) to 36.7% (Borzabadi-Farahani, 2009). Sometimes the deep overbite is so severe that the front teeth bite into the gums either behind the upper front teeth or in front of the lower front teeth producing damage (traumatic overbite) (Dermaut, 1997). Before treating a deep bite, it is necessary to establish its cause whether from reduced lower face height, lack of eruption of posterior teeth, or from over eruption of the anterior teeth (Nanda, 1997).

Nanda classified the correction of deep overbite by four types of entity i.e. extrusion of posterior teeth, flaring of anterior teeth in the case of lingually tipped incisors, intrusion of incisors, and the surgical method (Melsen, 1989). It is appropriate to remember that eruption probably affected by resting mandibular posture and freeway space occurs more rapidly in some patients than others. Some short face children show extremely rapid mandibular growth when the bite is opened and incisor overlap is removed, even with so simple an appliance as a bite plate (Nanda, 1997).

CASE REPORT

A 14 year old male patient reported to the Department of Paedodontics and Preventive Dentistry with the chief complaint of impingement of his lower teeth on to the palatal tissue since past 7 -8 months. On clinical examination it was found that the patient had orthognathic profile with Class I molar relation, normal overjet and 80% anterior deep bite. Patient's 12 (permanent lateral incisor) was found missing as a result of trauma 2 years back. On performing pulp vitality test 13, 11, 21, 22 were found vital. Then, patient's cephalogram was recorded and manually traced. Various cephalometric angles were calculated. The values of ANB angle (4 degrees), Facial angle (81 degrees), Beta Angle (25 degrees) and Wits Appraisal (0.5mm) suggested that the patient had Skeletal Class II pattern with normal incisor inclination (130 degrees). The lower anterior facial height of the patient was found to be decreased (60mm). Mandibular plane angle (24 degrees) portrayed normal growth pattern.

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Fig. 1. Preoperative intraoral maxillary arch view showing missing 12

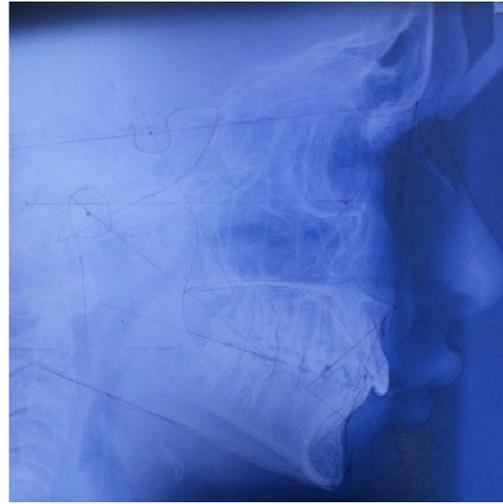


Fig. 5. Patient's preoperative cephalogram



Fig. 2. Preoperative intraoral mandibular arch view



Fig. 6. Fabrication of removable bite plane



Fig. 3. Preoperative intraoral right lateral view



Fig. 4: Preoperative intraoral front view showing anterior deep bite



Fig. 7. Patient's maxillary arch with removable bite plane

Table 1. Patient's Preoperative Cephalometric Values

MEASUREMENT	RANGE/ MEAN	PATIENT VALUE	INFERENCE
SNA	82 degrees	79 degrees	Retrognathic maxilla
SNB	80 degrees	75 degrees	Retrognathic mandible
ANB	2 degrees	4 degrees	Skeletal Class II pattern
Facial angle	82 -95 degrees	81 degrees	Skeletal Class II pattern
Angle of Convexity	- 8.5 - 10 degrees	5 degrees	Normal profile
Mandibular Plane angle	17- 28 degrees	24 degrees	Normal growth pattern
Y Axis	53 – 66 degrees	65 degrees	Normal growth pattern
Interincisal Angle	130 – 150.5 degrees	130 degrees	Normal inclination
Wits Appraisal	0 - -1mm	0.5 mm	Skeletal Class II
Lower anterior facial height	64.3 – 67.9mm	60 mm	Decreased
Jaraback's Ratio	62 – 65 %	74.5%	Horizontal growth pattern
SN – Go Gn	32 degrees	29 degrees	Horizontal growth pattern
Beta angle	Class I 27 – 35 degrees Class II less than 27 degrees Class III more than 35 degrees	25 degrees	Skeletal Class II pattern



Fig 8. Patient's front view with removable bite plane



Fig.9. Postoperative intraoral front view showing deep bite correction and RPD wrt



Fig. 10. Postoperative intraoral right lateral view

However, Jaraback's Ratio (74.5%) and SN-Go Gn (29 degrees) suggested horizontal growth pattern of the patient. On the basis of cephalometric analysis patient was found to be a Horizontal grower with Decreased Lower Anterior Facial Height.

Horizontal growth pattern of the patient favoured the correction of deep bite by means of extrusion of posterior teeth using removable anterior bite plane. After recording and disinfecting patient's alginate impression casts were poured with dental stone. Then, a removable appliance comprising of a labial bow and 2 Adams clasps on molars was fabricated. Anterior bite plane was incorporated into the removable appliance and its height was so adjusted that the posterior teeth are only 1- 2 mm disoccluded. After the adjustment of the appliance intraorally, the patient was instructed on the usage of 18-20 hours daily and maintenance of the hygiene of the appliance. Patient was recalled weekly to get the adjustments done in the appliance. Deep bite was corrected in 2 months. In the meantime, a RPD wrt 12 was delivered to the patient.

DISCUSSION

Patients exhibiting a large interlabial gap, a short upper lip, a high gingival smile line, and a long lower facial height especially need intrusion of incisors (Melsen, 1989). Realistically, although bite depth changes can be made in the mixed dentition by intrusion of anterior teeth, intrusion is difficult to retain-even in later phases of full appliance therapy. Children with vertical deficiency can be identified at an early age. They usually have a normal maxilla but have decreased eruption of maxillary and mandibular teeth. Many tend to have a low mandibular plane angle (skeletal deep bite) and a long mandibular ramus. Growth is expressed in an anterior direction, with a tendency toward upward and forward rotation of the mandible. The challenge in correcting these problems is to increase eruption of posterior teeth and influence the mandible to rotate downward without decreasing chin prominence too much (Proffit *et al.*, 2007). In a patient with Class II malocclusion, one way to correct such problems is with cervical headgear, a king advantage of the extrusive tendency of extraoral force directed below the centre of resistance of the teeth and the maxilla. This effect and eruption of the lower molar can be accomplished using a headgear and a biteplate to open the bite, a method used in the Florida prospective clinical trial. With no posterior occlusion, both upper and lower teeth can erupt (Proffit *et al.*, 2007). The other way is to use a functional appliance that allows free eruption of the posterior teeth. They take maximal advantage of mandibular growth by having it expressed in an anterior direction. It places into sharp focus the interaction between the anteroposterior and vertical planes of space that must be addressed during growth modification treatment (Proffit *et al.*, 2007).

The fixed functional appliances tend not to be good choices in the mixed dentition treatment of short face problems. Certainly, the Herbst, with its propensity to intrude the upper molars, is not an attractive option for younger patients needing increased vertical dimensions, even though the mandibular plane angle usually does not change very much in Herbst treatment. The twin block does offer some options to manage posterior eruption when the acrylic is modified during treatment (Proffit *et al.*, 2007).

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