

Treatment of A Class I Malocclusion With Severe Bimaxillary Protrusion -A Case Report.



Medical Science

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ABSTRACT

This case report describes the treatment of a 20-year-old girl from Karnataka who had severe bimaxillary dentoalveolar protrusion. The main issue in determining the appropriate treatment plan was the severity of the dentoalveolar protrusion. Four first premolars were extracted to reduce lip procumbancy. The change in the patient's facial esthetics was dramatic. Significant retraction of the upper and lower lips was achieved, and lip eversion and dentoalveolar protrusion were significantly improved. As the lips were retracted, mentalis strain was reduced; this improved chin projection.

MANUSCRIPT

Common treatment approach for patients with severe bimaxillary dentoalveolar protrusion, facial convexity, lip incompetence, and crowding is to extract 4 first premolars and then retract the anterior teeth.^{1,2} However, the treatment plan becomes more complex and controversial when the patient is female with hyperdivergent and has slight to moderate bimaxillary protrusion with minimal crowding of teeth. The options are to extract 4 teeth and reduce the convexity of the face or to align the teeth without extractions and possibly increase the convexity of the face. This case report describes the treatment approach and rationale for extraction in a female patient with bimaxillary dentoalveolar protrusion.

Case presentation

The patient was a healthy 20-year-old girl from north Karnataka. Her chief complaint was, "I want to get braces because my front teeth are protruding." There was no history of dental trauma or oral habits. The patient had good oral hygiene. Her medical history showed no contraindication to orthodontic treatment.

Diagnosis

Facially, the patient had a convex profile, a long lower face height, and excessive vermilion show of the upper and lower lips. She had procumbent and everted upper and lower lips, a deep mentolabial sulcus, and excessive lip strain on closure (Fig 1). Her dentition was characterized by a Class I malocclusion with severe dentoalveolar protrusion (Figs 2). She showed mild mandibular crowding, 4 mm of overjet, 2 mm of overbite, and coincident midlines. Soft tissue analysis indicated that she had protrusive lips

The panoramic radiograph showed no evidence of bony pathology. As evidenced by the SN-mandibular plane angle of 42°, the skeletal pattern was hyperdivergent. There was clock wise rotation of mandible. The patient had protruded and proclined maxillary incisors.

Treatment alternatives

The main issue in determining the appropriate treatment plan was the severity of the dentoalveolar protrusion. It was recommended that the 4 first premolars be extracted to reduce the patient's lip procumbancy.

Another treatment alternative was nonextraction plan with interproximal tooth reduction of the premolars. This plan would not address the patient's chief complaint but

would alleviate her mild crowding. With reproximation, the incisal angulations would not be affected, and the patient's bidentoalveolar protrusion would remain the same..



Treatment progress

An .022 MBT brackets was used. The maxillary and mandibular arch were banded and bonded, and a transpalatal arch was placed on the maxillary first molars to increase anchorage. Shortly afterwards, the 4 first premolars were extracted. All 4 second molars were banded to increase anchorage. Initial leveling and aligning was accomplished with .014-in nickel- titanium following 0.016 nickel titanium and 17x25 niti archwires. The arch wires were cinched to avoid proclining the maxillary and mandibular incisors during leveling. The duration was around 6 months.

After completion of levelling and aligning the retraction of anterior canine to canine was

initiated with the help of active tie back from second molar on 19x25 ss hooked arch wires where the hook was placed between mesial to canine. Before start of the retraction bite correction was done by giving reverse curve in lower arch. The retraction process took 8 months for completion after which the extraction spaces were completely closed. Total duration of treatment time was around 15 months after which the case was debonded. Permanent lingual retainer was given in both upper and lower arch and removable Hawley's retainer for both arches. The patient was instructed to wear the removable retainer full time for 1st six months and after that to reduce it to night time wear only.

DISCUSSION

Treatment objectives should be directed towards an ideal. However, facial forms and incisor prominence differ among various ethnic groups and races. For example, whites of Northern European background generally have relatively thin lips, with minimal lip and incisor prominence.³ Blacks commonly display bi-maxillary dentoalveolar protrusion, which is characterized by dentoalveolar flaring of both maxillary and mandibular anterior teeth, with resultant protrusion of the lips and convexity of the face.^{4,7} However, the concept of beauty is subjective, and no single racial study can apply to all persons of a race.¹ The treat-

ment-planning process is even more important when treatment is likely to alter the soft tissue profile. Although there have been published attempts^{10,11} to define a beautiful face, the definition changes as society and its esthetic values change.¹² A patient's expectation of treatment must be considered first and foremost, because ideals of esthetic profiles vary.¹³

Kocadereli¹⁴ found that, when a decrease of lip procumbency is desirable, extracting premolars and retracting incisors is a viable option to achieve these objectives. On the basis of the patient's chief complaint and the diagnosis of the malocclusion, extracting the maxillary and mandibular first premolars was indicated. When extracting premolars is desired to correct the malocclusion, the treatment plan must address space closure of the extraction sites. Closure of the extraction sites can occur by retraction of the anterior segments, protraction of the posterior segments, or a combination of the two.¹⁵ When it is indicated to prevent mesial movement of the posterior segments in the anteroposterior dimension, this is termed maximum anchorage. Maximum anchorage in this case was necessary and predicated on the need to restrict mesial movement of the maxillary and mandibular first molars until the crowding and bimaxillary protrusion were resolved. To augment anchorage, adjunctive appliances, such as a transpalatal bar, a Nance holding arch, palatal implants, or extraoral traction, are usually necessary. Intraoral sources of anchorage include alveolar bone, teeth, dental arches, palatal and mandibular basal bone, differential moment mechanics, and lip musculature.¹⁵ Renfroe¹⁶ stated that, to be stable, the anchorage unit must be overwhelmingly more resistant than the teeth being moved. In this case, anchorage in the maxilla was achieved with a transpalatal bar, bonding of the second molar. Mandibular anchorage was achieved by bonding the second molars.

Various investigators have reported a range of mesial molar movement of 0 to 2.4 mm when canine retraction is combined with the use of adjunctive appliances to control anchorage.^{15,16-21} When adjunctive appliances are not used while retracting canines with traditional mechanics, 1.6 to 4 mm of mesial molar movement has been reported.^{20,21}

CONCLUSIONS

Patient with procumbent upper and lower lips, a deep mentolabial sulcus, excessive lip strain, and proclined and protruded maxillary and mandibular incisors, an acceptable treatment result was obtained with a 4-first-premolar extraction plan. A positive soft tissue response to treatment was

also achieved. The patient's profile was improved, with reduction in lip procumbency, decrease in lip eversion and protrusion, and decreased mentalis strain. Dentally, the interincisal angulation improved significantly because both the maxillary and mandibular incisors were uprighted after space closure

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