CASE REPORT

Aesthetic acceptance equals to nature's compensation plus surgical correction

Vaishali Vadgaonkar,¹ Parag Gangurde,² Anita Karandikar,³ Nikhil Mahajan²

¹Department of Orthodontia, Bharati Vidyapeeth Kharghar, Kharghar, Navi Mumbai, Maharashtra, India

²Department of Orthodontics & Dentofacial Orthopedics, Bharati Vidyapeeth Kharghar, Navi Mumbai, Maharashtra, India

³YMT Dental College & Hospital, Navi Mumbai, Maharashtra, India

Correspondence to

Professor Vaishali Vadgaonkar, orthovaishali@gmail.com

SUMMARY

Orthognathic surgery has become an acceptable treatment plan for patients with various maxillofacial deformities. The rehabilitation of severe class III adult patients requires a complex interdisciplinary orthodontic and orthognathic approach. This presentation aims to show a case of combination of camouflage and bilateral sagittal split osteotomy (BSSO). Camouflage in maxillary arch was accepted after analysing visual treatment objective (VTO) and pleasing soft tissue compensation which gave us the clue to go ahead for surgical correction of excess mandibular length to achieve best aesthetic outcome while maintaining nature's compensation in upper arch.

- History
- Clinical examination
- Investigations
- Initial diagnosis
- Treatment plan
- Presurgical orthodontics
- Final treatment plan
- Surgery
- Postsurgical orthodontics
- Retention

This presentation aims to show the surgical and orthodontic procedure in correcting complex class III patients with long faces.

CASE PRESENTATION

In January 2012, a woman, aged 24 years 1 month, presented with poor facial appearance (figures 1–4). An engineering student, who to pursue her master's degree in the USA by September 2012, had concern about improving her facial aesthetic before leaving for her further studies. Her intraoral examination showed maxillary dental midline coincident with the facial midline, but the mandibular dental midline was skewed approximately, 2 mm to the left, relative to the maxillary midline. Anterior and posterior cross bite was present. A cephalogram confirmed the class III skeletal and dental malocclusion.

INVESTIGATIONS

Extraoral and intraoral photographs, study models, lateral cephalogram, orthopantomogram (OPG) and video recording of the patient was

BACKGROUND

Class III malocclusion is an anomaly that is difficult to understand. Studies conducted to identify the aetiological features of class III malocclusion showed that the deformity is not restricted to the jaws but involves the total craniofacial complex. Most subjects with class III malocclusions have combinations of skeletal and dentoalveolar components. The factors contributing to the anomaly are complex. They can act synergistically or in isolation. Treatment of skeletal class III malocclusion in an adult requires dentoalveolar compensation or combined orthodontic and surgical procedures, with the aim to achieve normal occlusion and improve facial aesthetics.

The management protocol for facial deformity should comprise the following:

Figure 1 Initial facial situation, concave profile.

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Figure 2 Initial occlusion: severe class III malocclusion.

performed. Dolphin orthodontic software was used for analysis (figures 5–7).

DIFFERENTIAL DIAGNOSIS

The lateral cephalogram was analysed and revealed the following:

- ▶ Extremely large mandibular length (Co–Gn 222.9 mm);
- ▶ Retruded lower incisors (incisor mandibular plane angle (IMPA) 71.1°);
- ▶ Large intercincisal angle (128.9°);
- ▶ Mandible forward to maxilla (Wits appraisal –30 mm);
- ▶ Class III skeletal relationship (A point–nasion–B point (ANB) –8.5°);
- ▶ Horizontal growth pattern (y-axis 54.5°).

The cephalometric prediction suggested that surgical movement would optimise the dental and facial balance.

The treatment plan consisted of

Figure 3 Pretreatment lateral cephalogram.

- ▶ Presurgical orthodontics;
- ▶ Bilateral sagittal split osteotomy;
- ▶ Postsurgical orthodontics.

TREATMENT

The objectives of treatment for this patient were to eliminate the prognathic mandibular position, correct the associated dental malocclusion and establish normal functional occlusion with normal anterior overbite and overjet; to improve facial and dental aesthetics in a shorter duration of time.

After analysing visual treatment objective (VTO; figure 4) when the jaw is slightly opened then overclosure of lip is avoided and lips fall in better position. Soft tissue compensation in maxillary arch is also very clear from the VTO. So nature's compensation in maxillary arch was accepted.

Teeth in both arches were then bonded with conventional fixed appliances with 0.022 slot MBT (McLaughlin, Bennet,

Figure 4 Pretreatment OPG.

Figure 5 Visual treatment objective (VTO) suggesting that lips fall in better position when over closure is avoided.

Trevisi) brackets. After a series of round wires to gain bracket engagement and establish initial arch-form coordination, arch wires, first 0.016×0.022 SS and then 0.019×0.025 stainless steel (SS), were placed. Bilateral sagittal split osteotomy (BSSO) of the mandible was performed by a maxillofacial surgeon to correct the excess length of mandible. This reduced the trauma of two surgeries to the patient and also reduced the cost, as only one jaw surgery was carried out. Final arch coordination and minimal occlusal equilibration was accomplished during the next 1 month. All fixed appliances were then removed, and the patient was given fixed lingual bonded retainer in the maxillary and the mandibular arch.

OUTCOME AND FOLLOW-UP

Normal functional occlusion was established with normal anterior overbite and overjet. The mandibular prognathism was eliminated; the patient's facial aesthetics was much improved. Mandibular arch form and intercanine width had been maintained.

DISCUSSION

In the traditional combined orthodontic and surgical treatment of dentofacial anomalies, presurgical orthodontics is aimed at

relief of dental crowding and decompensation. Its purpose is to provide stable occlusion, a proper position for the teeth and arch coordination after the operation. Presurgical decompensation takes the most time in the total treatment course, roughly around 6 months to 2 years, and varies among patients and orthodontists. During this period, patients may experience deterioration of both the facial profile and function. In skeletal class III cases, the lower incisors are usually crowded and retroclined while the maxillary incisors are commonly flared out. One of the goals of presurgical orthodontics is to position incisors in a proper angulation to the jaw bone, so the surgeon can set back the jaw bones to their maximum. Sometimes extraction is required for retraction of the upper anterior teeth and relief of lower crowding but in this case extraction was not required.

The position of anterior teeth is important and related to the amount of mandibular setback. Problems with facial aesthetics, especially facial balance and chin position, are mainly managed by surgery. Deliberate rotation of the maxillomandibular complex can effectively change the relationship between the A point and B point as well as proper midface projection and provide enough setback of the chin point. The treatment course was quite short in this particular case, less than 7 months; it was

Figure 6 Presurgical extraoral photographs.

Figure 7 Presurgical intraoral photographs.

Figure 9 Postsurgery intraoral photographs.

Figure 8 Settling elastic postsurgery.

possible because of better planning and also because of taking the right call of going only for single jaw surgery to correct the excess mandibular length and accepting nature's compensation in maxillary arch by carefully analysing the VTO and soft tissue compensation in the maxillary arch. This reduced the trauma of two-jaw surgery and also reduced the cost of two-jaw surgery. In this case, the patient was very satisfied with the pleasing aesthetic results achieved in just 7 months and was more confident about herself to pursue her future studies in the USA.

A few percentage of BSSO cases are known to have relapsed.¹ The proximal segment has a tendency to move back toward its presurgical position in the period following surgery. Maintaining the presurgical position of the proximal segments during surgery seems to be a major determinant of postsurgical stability. In this case postsurgical relapse was not seen as the segments were stabilised for adequate period of time (figures 8–10).

Figure 10 Postsurgery extraoral photographs.

There was a significant correlation between the change in sella-nasion-B point (SNB) angle and thickness of the upper lip in patients treated with BSSO only.²

Learning points

- ▶ Emphasis should be placed on a thorough understanding of nature's compensatory mechanism in case of facial discrepancy while planning orthognathic surgical treatment.
- ▶ Use of advanced diagnostic tools facilitates diagnosis.
- ▶ Orthodontist can be a team leader in such interdisciplinary treatments.
- ▶ Patient's poor aesthetics is the top most priority while planning treatment.
- ▶ Accepting the compensations provided by the nature's mechanism and harmonising it with the lower arch that is repositioned distally by BSSO produced satisfactory pleasing aesthetics.
- ▶ Combination of orthodontic and orthognathic surgery can expand the scope of treatment delivery.
- ▶ Visualising the treatment result as per different treatment options carries more weightage while finalising the treatment plan.

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REFERENCES

- 1 Cho HJ. Long-term stability of surgical mandibular setback. *Angle Orthod* 2007;77:851–6.
- 2 Jokić D, Jokić D, Uglešić V, *et al*. Soft tissue changes after mandibular setback and bimaxillary surgery in class III patients. *Angle Orthod* 2013;83:364.

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