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Orthognathic surgery in skeletal class II with facial asymmetry: A case report

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Abstract

Facial asymmetry is extremely visible, has a negative impact on one's quality of life, and is a common orthodontic patient complaint. In order to improve the occlusion and facial aesthetics of patients with extreme facial asymmetry, a combination of orthodontic and orthognathic surgical procedures is typically used.

In Angle's Class II subdivision malocclusion, on one side, there is a Class I molar relationship, and on the other, a Class II molar relationship. It could be tied to oral problems, skeletal problems, or a mixture of both. In these circumstances, to have symmetry on each side and in each dental arche is the goal. More over half of all Class II cases are subdivision cases.

Introduction

Extremely noticeable facial asymmetry is a frequent complaint among orthodontic patients, and it can also reduce one's quality of life. In an effort to enhance the occlusion and facial aesthetics of patients with extreme facial asymmetry, a mix of orthodontic and orthognathic surgical techniques are often used.

At the University of North Carolina, Severt and Proffit studied 1460 patients and discovered that 34% of them had facial asymmetry, with the chin's deviation being the most notable aspect of the condition. 74% of asymmetrical individuals had a deviated chin, and the incidence of lateral guiding of the upper and midface was 5% and 36%, respectively.[1]

On one side, there is a Class I molar relationship, and on the other, there is a Class II molar relationship, is how Angle's Class II subdivision malocclusion is best described. Various skeletal issues, dental problems, or a mix of the two may be to blame. In these situations, symmetry is desired on either side and in each dental arch. Cases involving subdivision make up about 50% among all Class II cases.[2]

Class II subdivision malocclusions exist in two separate variations:

TYPE 1: is distinguished by having the mandibular first molar on the Class II side at a distal position. In such a case, the dental midline of the mandible departs from the midline of the face while the dental midline of the maxilla coincides with facial midline.

TYPE 2: defined by the mesial placement of the first maxillary molar on the Class II side. In this scenario, the midline of the maxillary arch is asymmetrical and the midline of the mandibular arch aligns with the facial midline.[3] Type 1 is more widespread than Type 2 of the two varieties.

Dental anomalies include atypical eruption of the teeth, early loss of baby teeth, permanent tooth loss, and genetically absent teeth. Skeletal anomalies include growth-related or congenital disparity in either one or both arches, rear positioning of the temporomandibular fossa, and

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functional shift of mandible.[4] Resorption of the condyle that occurs unilaterally is linked to asymmetry that gets worse with time. The afflicted side increases its Class II status. The degree of distortion and the therapeutic approach determine what sort and duration of treatment is required. Untreated fractures or unilateral ankyloses are contributing environmental factors. Essentially, the etiology is a result of a confluence of hereditary and environmental variables.[5]

Case Report

A female patient, 21 years of age, was referred to the Orthodontic department at Islamabad Dental Hospital with a presenting complaint of malaligned teeth and asymmetric face. The patient was accompanied by her parents who did not show any signs of asymmetry.

Diagnosis and Etiology

The patient had a retrognathic mandible and skeletal class II malocclusion. On her left side, she had a Class I molar relationship, while on her right side, she had a Class II molar relationship, according to the intraoral examination. Further examination revealed a missing mandibular left lateral incisor (Figure 1). The overjet was 3mm and overbite was 5mm. On cephalometric analysis, the patient had a high vertical angle and the mandibular incisors were proclined. On posteroanterior cephalogram, the mandible was deviated towards the right side (Figure 2).

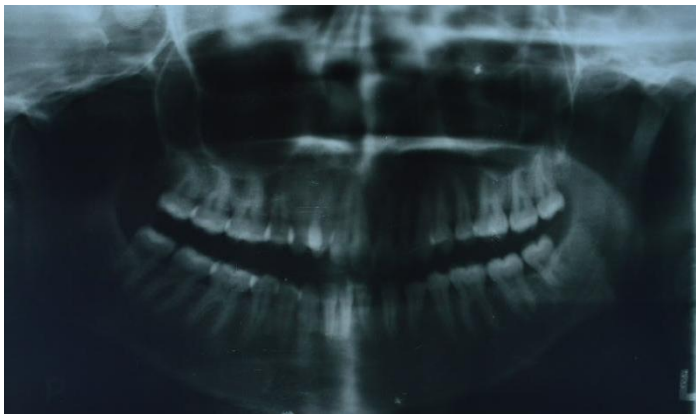

Figure 1. OPG showing missing lower incisor

Figure 2. Lateral cephalogram and frontal cephalogram of patient

Figure 3. Extra oral photographs of the patient

Figure 4. Intra oral photographs of the patient

Treatment Objectives

Treatment for patients who encounter face asymmetries should be done with multidisciplinary perspectives. The preferred course of treatment for these patients should be orthodontic treatment to address the malocclusion and orthognathic surgery to correct the facial asymmetry.

Treatment Plan

In this patient, the treatment plan was to correct the malalignment with presurgical orthodontics and asymmetric bilateral sagittal split osteotomy (BSSO) advancement to fix the retrognathic and asymmetrical facial features. A second surgery was planned to slide the chin to the left to further correct the asymmetry.

Treatment Alternative

Distraction osteogenesis was also a treatment option. It would correct the facial asymmetry but would not advance the mandible. So this treatment option was excluded.

Treatment Progress

The patient was secured using 0.022-slot MBT prescription brackets. The treatment was to be finished without any extractions. Standard procedure was followed, first using flexible Niti wires to level and align the surface, followed by the use of rigid stainless steel wires. With a few sporadic breaks, the pre-surgical orthodontics progressed without a hitch. Dental impressions of the patient were taken once pre-surgical orthodontics was finished, mounted on a semi-adjustable articulator, and recorded. These movements were planned using model surgery. The creation of a surgical splint for intraoperative guiding was done.

After presurgical orthodontics, asymmetric bilateral sagittal split osteotomy (BSSO) surgery was done to move the mandible forward and to make corrections for the facial asymmetry. After the surgical procedure, molars and canines were in a Class I relationship.

Augmentation genioplasty was performed after six months to slide the chin towards the left to further correct the asymmetry.

After debonding, essix retainer was given in the maxillary arch for retention and a bonded retainer from right canine to left canine was given in the mandibular arch.

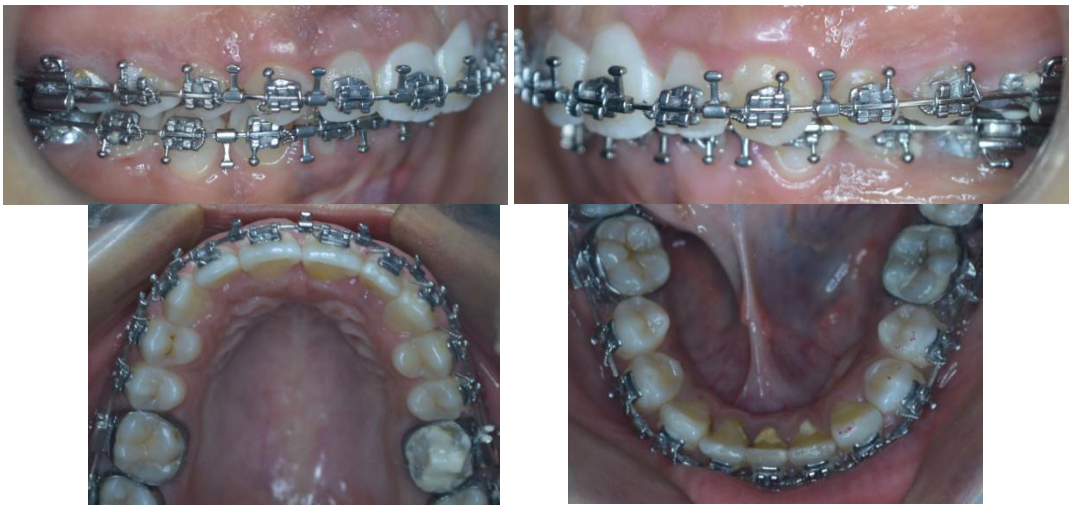

Figure 5. Presurgical extraoral and intraoral photographs

Treatment Results

The patient responded well to the orthodontic treatment and was cooperative. We were able to achieve class I occlusion. Carious teeth were restored during the treatment. During debonding, residual overjet and a slightly increased overbite was left because one incisor was missing in the lower arch. The resulting dentofacial aesthetics were acceptable in the patient's opinion. On lateral and anteroposterior cephalogram superimposition, a significant improvement in the facial profile was seen. The patient was really happy with the end result.

Figure 6. Lateral cephalogram and OPG after BSSO advancement

Figure 7. Extra oral and intra oral pictures of patient after debonding

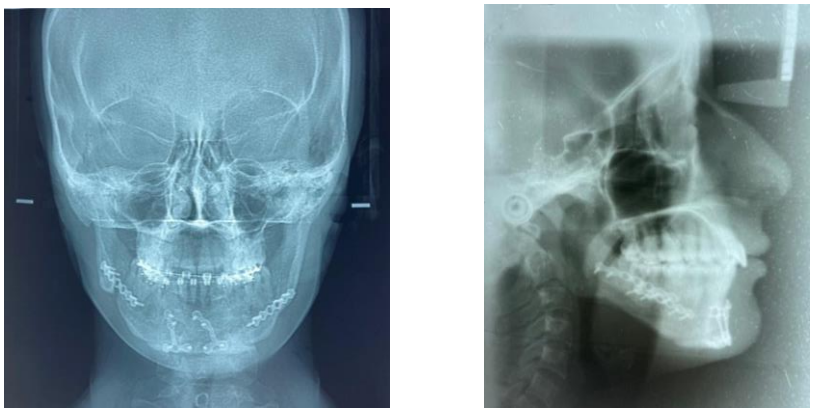

Figure 8. Radiographs of the patient at debonding

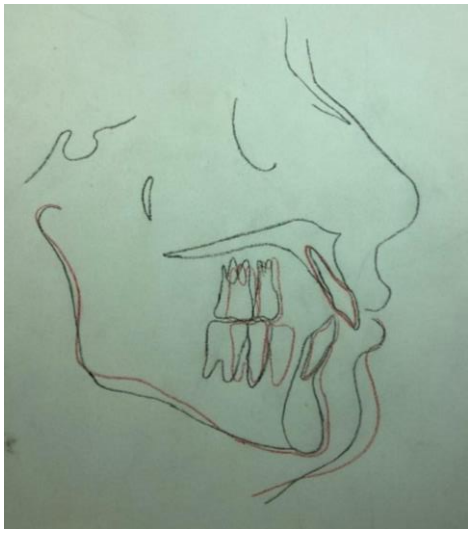

Figure 9. Superimposition of pre and post treatment radiographs

Discussion

The patient's aesthetic and functional development is significantly impacted by facial asymmetry, which is a difficult problem to treat.[6] Making a suitable treatment approach requires determining the cause of any asymmetries. Orthodontic treatment is frequently combined with sophisticated surgical treatments for severe bone abnormalities.[7]

In order to attain symmetry by the end of the therapy, orthodontic procedures or surgical relocation must be executed asymmetrically, subject to the extent of dental, skeletal, or soft tissue imbalance.[8]

In those situations, it is ideal to use orthodontic mechanics in order to address any possible dental compensations in every single plane of space. Particular concentration should be paid to the torque of the rear teeth, because it typically varies between both the sides in an attempt by the body to make up for the transverse skeletal imbalance by creating dental modifications.[9]

Obwegeser and Makek classify hemimandibular skeletal asymmetries as either hemimandibular hyperplasia or hemimandibular elongation.[10] In the vertical plane, the condyle or ramus is prolonged, whereas in the horizontal plane, the mandibular body is lengthened in hemimandibular elongation. The dental midline typically drifts off to the side opposing the abnormality.[11] The patient who was being seen had a left mandibular body that had grown longer, causing hemimandibular elongation. Teeth and dental arches decompensation was done during preoperative orthodontic period to make it easier to surgically repair the mandible's sagittal misalignment. The patient accepted the modest midline deviation because it has been shown that patients can tolerate a 2 mm discrepancy between the midline of the maxillary teeth and midline of the face.[12-13]

Conclusion

With asymmetric BSSO advancement, asymmetry of the face combined with skeletal class II and dental class II subdivision malocclusions can be successfully treated, restoring function, aesthetics and psychosocial wellbeing of the patient. The patient's worries were addressed and the patient feels quite happy and satisfied with the results.

Conflict of interest

No conflict of interest.

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