

MANAGEMENT OF DENTOFACIAL SKELETAL DEFORMITY WITH ORTHOGNATHIC SURGERY

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INTRODUCTION

Dentofacial deformity refers to deviation from normal facial proportion and dental relationship that is severe enough to be handicapping. The affected individuals are handicapped in two ways, first jaw function is compromised and second dental and facial appearance often leads to discrimination in social interactions [1]. Orthognathic surgery involves the surgical manipulation of the elements of the facial skeleton to restore the proper anatomic and functional relationships in patients with dentofacial skeletal anomalies [2]. Data shows that between one third and one half of the patients with dentofacial deformities have high level of psychologic distress, high enough to predict continuity problems in interpersonal relationships and significantly affect overall quality of life [3,4].

We here present a case of a young female with dentofacial deformity and severe psychosocial distress which was managed by bimaxillary orthognathic surgery with excellent functional and esthetic results.

CASE REPORT

A 23 years female reported to Armed Forces Institute of Dentistry for correction of her gummy smile, lip separation at rest and proclined upper teeth. History revealed that she was undergoing orthodontic treatment for past 3 years but was dissatisfied with her facial appearance and progress of treatment. She was anxious to improve her social life. Local examination showed lip incompetence (12 mm separation at rest), excessive maxillary incisor display at rest (12 mm), excessive gingival display on smile (5 mm), convex facial profile and retrognathic mandible with retruded chin. Intraoral

examination showed good oral health with increased overjet (5 mm) and overbite (6mm), missing mandibular 1st molars and maxillary 2nd premolars, spacing in both maxillary and mandibular teeth, Class II dental relationship and excessively proclined lower incisors (a legacy of the previous orthodontic treatment to mask skeletal discrepancy) with apex buldge at lingual aspect.

Radiographic and other investigations included Orthopantomogram (OPG), Lateral Cephalogram, detailed cephalometric analysis, study models, and photographic analysis. OPG showed mesially tipped mandibular 2nd molars and no bone pathology. On cephalometric evaluation SNA was 85°, SNB 72° and ANB 13°. Vertical analysis showed 7mm of vertical excess.

On the basis of clinical examination and other investigations a diagnosis of skeletal class II malocclusion with mild vertically high angle and convex facial profile was made.

Treatment options of camouflage and orthognathic surgery to correct this severe skeletal dentofacial deformity was given to the patient. Patient opted for orthognathic surgery.

Treatment plan was made on the basis of clinical examination. Investigations/analysis were carried out and consisted of:

1. Orthodontic leveling and alignment of arches with torque of the mandibular central incisors to improve their axial inclination and closure of spaces.
2. Orthognathic surgery,
 - a. Le-Fort I osteotomy for superior repositioning of maxilla 7mm and to push back maxilla 4mm.

- b. Bilateral sagittal split osteotomy for achieving Class I dental relationship by advancing mandible 5mm.
- c. Forward sliding genioplasty

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for increasing chin prominence 8mm.

Post surgical care and orthodontics.

After 6 months of orthodontic preparation, overjet had increased as the axial inclination of lower incisors were corrected, all the spaces were closed and occlusal relationship was still Class II.

During the orthognathic surgery maxilla was moved up and posterior by Le Fort I osteotomy, mandible was brought forward in Class I dental relationship with bilateral sagittal split osteotomy and chin was advanced to increase chin prominence by forward sliding genioplasty. At the completion of treatment both static and dynamic facial esthetics were greatly improved by the reduction in facial convexity and face height.

A dramatic change in patients profile occurred after surgical intervention (Fig.1). Patient is now confident with her new remarkably improved facial appearance.



Fig. 1: Pre and Post treatment profile of patient.

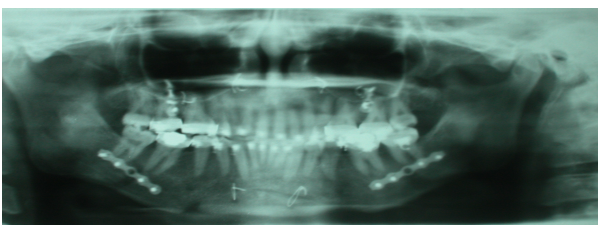


Fig. 2: Post treatment OPG.

Post operative OPG and lateral cephalogram showed that as planned mandible was brought forward on both sides, maxilla has moved posteriorly and superiorly and chin has moved forward (Fig. 2).

DISCUSSION

Dentofacial skeletal anomalies generally occur as a result of a differential in growth of the upper facial skeleton to the lower facial skeleton, resulting in discrepancy of the normal relationship that exists between the upper and lower jaw. Congenital anomalies, from syndromic conditions such as Apert and Crouzon syndromes to facial clefts, affect normal growth and development [5]. Traumatic events in the mature skeleton can displace the normal elements and require repositioning osteotomies if improperly reduced initially whereas traumatic events in the developing facial skeleton can disturb normal subsequent growth [6].

A wide range of clinical presentation is possible ranging from convex to concave profile, increased or decreased lower and upper facial height, excessive gingival display, markedly disturbed occlusion and facial esthetics and most importantly adverse psychosocial impact resulting from an abnormal facial appearance [7, 8].

Diagnosis is based on a comprehensive assessment that includes clinical examination, skeletal evaluation with standardized radiograph and dental evaluation with study dental casts. Clinical photographs are essential for documentation and allow for photometric analysis. Skeletal evaluation typically includes radiographic evaluation with OPG and cephalometric radiographs, additional radiographs include periapical films and hand wrist films [9] to help determine skeletal age of patient. Recently data base computer programs [10] have been introduced including digital photography,

digitized cephalometric examination and electronic dental casts.

Treatment can be divided into 5 phases [2, 11].

1. Preorthodontic preparatory phase
2. Presurgical orthodontic treatment phase
3. Surgical phase
4. Postsurgical orthodontic phase
5. Prosthodontic treatment phase

The elements of the facial skeleton can be repositioned, redefining the face through a variety of well-established osteotomies, including LeFort I-type osteotomy, LeFort II-type osteotomy, LeFort III-type osteotomy, maxillary segmental osteotomies, sagittal split osteotomy of the mandibular ramus, vertical ramal osteotomy, inverted L and C osteotomies, mandibular body segmental osteotomies, and mandibular symphysis osteotomies. Most maxillofacial deformities can be managed with 3 basic osteotomies: the mid face with the LeFort I-type osteotomy, the lower face with the bilateral sagittal split ramal osteotomy of the mandible, and the horizontal osteotomy of the symphysis of the chin [2].

Outcome depends on the surgical procedure, on a multitude of factors that begin long before the actual surgery, and on control of the variables long after the surgical procedure. If mobilization of the maxilla at the time of surgery is inadequate, obtaining a less-than-ideal occlusal relation, the post surgical orthodontic phase is prolonged and the likelihood of relapse increased [12]. With any skeletal movement, the surgeon always must be aware of the potential for relapse even in the most ideal situation and with the use of rigid internal fixation.

Although orthognathic surgery involves restoring the skeletal anatomy, the patient

ultimately is concerned with how the soft tissue drapes the new facial skeleton. The surgeon must be well aware of the soft-tissue response to skeletal movements. The goal is not necessarily to normalize cephalometric values; rather, the aim should be for the patient to have normal appearance and function. The patient basically decides to undertake surgery for cosmetic reasons while the surgeon proposes surgery to improve function. The psychological consequences of orthognathic surgery must be taken into account because the impact is considerable.

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