

Prosthodontic Intervention for an Open Bite – A Case Report

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Abstract

Apertognathia is an open bite clinical condition due to congenital or developmental deformity. This clinical condition may involve only dental component or in some cases both skeletal and dental component. The presence of missing teeth requires orthodontic and prosthodontic intervention to correct the clinical situation. However this case report presents a clinical situation where surgical and prosthodontic interventions were carried out to correct the open bite without orthodontic intervention.

Keywords: Apertognathia, Management of Open Bite, Lefort 1 Osteotomy for Open Bite, Bimaxillary Excess.

1. Introduction

Apertognathia refers to a clinical situation of dental anterior open bite. The clinical situation results in a poor aesthetic appearance for patients. The etiology of this clinical entity may either be congenital, developmental deformity, or a simple case of malocclusion with an open bite. [1] The open bite may be more severe in case of congenital deformity because the skeletal component is involved. [2] The treatment for this open bite depends on the severity of the clinical condition. The treatments options include craniofacial orthopedics if diagnosed during developmental period, orthodontic correction if diagnosed in later stages, orthognathic rehabilitation in very severe cases where both the dental and skeletal components contribute to the clinical situation. Prosthetic interventions in such cases are restricted to replace only the missing teeth. Prosthetic intervention has never been a choice of management in treating open bite cases. This case report highlights the management of open bite case by orthognathic surgery and prosthetic correction, thus indicating prosthognathic rehabilitation as a choice of management.

2. Case report

2.1. Appointment 1

A twenty-one year old female patient reported to the Prosthodontic Department complaining of poor esthetics. During the diagnostic interview the patient reported of poor self confidence and felt that her face was elongated and unpleasant. The patient desired for a new denture with less tooth exposure. The patient's history revealed that the patient had proclined anterior teeth which was extracted as an alternative to orthodontic correction and replaced with fixed partial denture. No relevant medical history was reported. Extra oral examination revealed 7mm of incisal exposure even at rest (Figure 1.a & 1.b). On intraoral examination dental open bite was present even with existing fixed partial denture (Figure 1.c). On removal of the fixed partial denture, bony defect was observed in the anterior edentulous region (Figure 1.d). Molar relation could not be assessed as the patient had missing mandibular molars.

Radiographic investigation with orthopantograph and lateral cephalograph revealed vertical maxillary excess (Figure 1.f). Skeletal component involvement was confirmed. The main objective of treatment was to correct the open bite. Several treatment options were considered. Although cases of open bite have been treated with

orthodontic intervention successfully, this option was not feasible as this patient had missing anterior teeth. Since there was significant maxillary excess, surgical option appeared most preferable. Orientation jaw relation procedure and diagnostic articulation was done.



Figure 1.a, 1.b – Extra oral profile view revealing 7mm of incisal exposure, Figure 1.c – Intra oral view with FPD, Figure 1.d – Intra oral view after removal of FPD, Figure 1.e, 1.f – Preoperative radiographs

2.2. Appointment 2

Diagnostic wax up and temporization was done to assess the amount of tooth exposure that can dictate the amount of orthognathic reduction required. A mock surgery (Figure 2.a) was performed according to the cephalometric tracings (Figure 2.b) to determine the

amount of maxillary reduction possible. For this patient 5mm reduction was required. Based on this the final treatment plan was established. After thorough preoperative investigation, Lefort 1 osteotomy surgery was performed (Figure 2.c) and the intermaxillary fixation was done to stabilize the autorotated mandible (Figure 2.d).

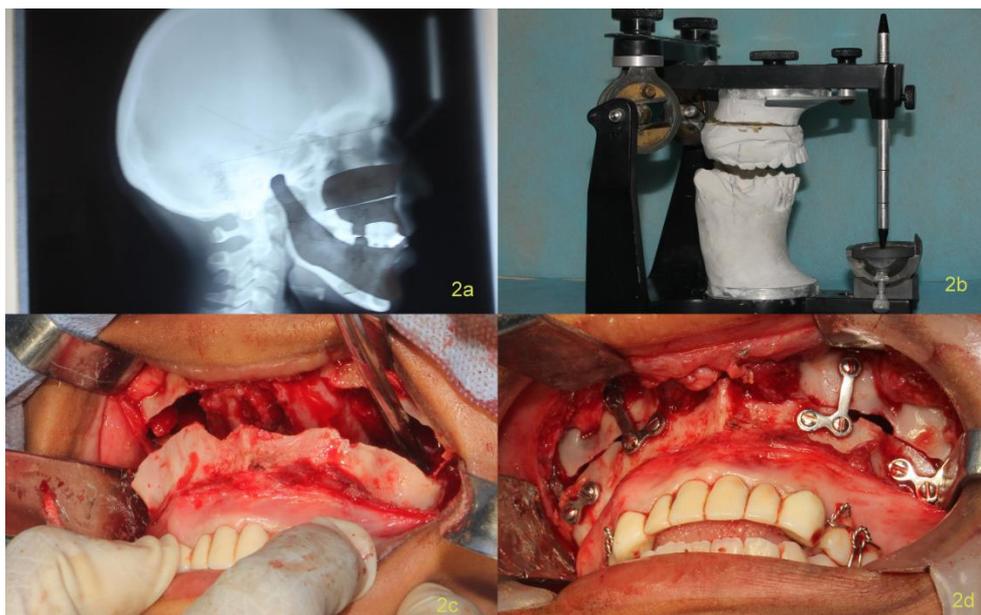


Figure 2.a – Mock Surgery done in a semi adjustable articulator, Figure 2.b – cephalometric tracings, Figure 2.c, 2.d– Lefort 1 osteotomy and intermaxillary fixation

2.3. Appointment 3

Six weeks after surgery prosthetic rehabilitation was started. The abutments of the anterior FPD 13, 23 were modified (figure 3.a). Proper finish lines were established after laser gingival retraction and a master impression (figure 3.b) was made with addition silicone. (Aquasil®), 2 stage putty wash technique. Acrylic

provisional restoration based on diagnostic wax up (figure 3.c) was cemented. Metal coping fit was verified, preglaze trials to verify the closure of open bite were performed before the final cementation (figure 3.d). The amount of tooth exposure was reduced with satisfactory esthetics. A 1 mm of open bite was still present post operatively but was aesthetically acceptable (figure 3.e, 3.f).



Figure 3.a – Modified tooth preparation, Figure 3.b – Final impression, Figure 3.c – Diagnostic wax up, Figure 3.d – Final restoration, Figure 3.e, 3.f – Post operative profile view

3. Discussion

Open bite cases often present with other malocclusion problems. The treatment of open bite depends on whether the skeletal or the dental component is involved. If the skeletal component i.e., if premaxilla is involved then a vertical maxillary excess with an open bite is considered as a complex open bite condition. [3] A simple open bite case can be corrected by controlling the habits [4], appliances [5] and sometimes with orthodontic correction. [6] A complex case of open bite often is associated with skeletal involvement and requires surgical correction. [7]

These cases present themselves with following clinical [1,4] and cephalometric findings. 1) The facial proportions in the lower and middle third of the face is high when compared to upper third of the face, 2) the lip incompetence is ≥ 4 mm, and 3) crowding in lower anterior. The above case presented with all the clinical features of a complex open bite.

The amount of tooth exposure and lip incompetence was a key factor in deciding for surgery. Lip

lengthening [8] remained a viable option to reduce the amount of tooth exposure, but the desire of the patient to have proportionate face could not be accomplished by this soft tissue surgery alone. A surgical reduction of maxillary excess reduced the patient's facial proportions as well as minimized the amount of tooth exposure. Several cases of complex open bite were successfully corrected by combined orthographic surgery and orthodontic rehabilitation. [7] The prosthetic rehabilitation for the missing teeth in the anterior region was the only option available to correct the open bite.

The presence of bony defect in the edentulous region remained a challenge during replacement. Implants for missing teeth required correction of vertical bony defect which would not give a predictable outcome. The prosthetic rehabilitation with fixed partial denture appeared to be a favorable option in this clinical situation. The existing prepared abutments supported the replacement option with a metal ceramic prosthesis. The short clinical crowns ruled out the choice of all ceramic prosthesis. Different methods of grafting the edentulous

site [9] and several pontic modifications [10] tissue sculpturing [11] have been recommended in the past. Characterization of the pontic [12] in the cervical region, Andrews bridge [13] were few of the options considered for pontics. The diagnostic wax up and the prior temporization proved to be satisfactory to reduce the amount of open bite. Hence the final prosthesis was fabricated without any pontic modification.

4. Conclusion

The prosthetic rehabilitation for an open bite case appears to be an alternative for orthodontic correction of open bite cases. However the presenting complaint of the patient and careful examination of associated problems decides the treatment plan.

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