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CASE REPORT

Functional and Esthetic Rehabilitation in a Partially Edentulous Patient: A Case Report

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Abstract A young male patient reported with forwardly placed mandible and partially edentulous upper and lower jaws. Patient's chief concern was towards his abnormal facial profile and difficulty in mastication. This case report describes various procedures performed to rehabilitate the patient functionally and esthetically. The treatment plan included Onlay bone grafting of mandible using iliac crest, body osteotomy of edentulous mandible and implant retained overdenture.

Introduction

Mandibular prognathism has been defined by Joffe [1] as a disorder of craniofacial growth in which the facial profile is marred by an undue prominence of the mandible. This deformity is characterised by an Angle Class III molar and/or incisor relationship in which the lower molars or lower incisors are further forward than normal.

Mandibular body osteotomy is not very popular for correction of mandibular prognathism because of complications such as inferior alveolar nerve injury and because of development of more effective surgical procedures such as mandibular sagittal split ramus osteotomy. However, there are several cases which indicate this less described procedure.

Prosthetic rehabilitation has been revolutionised over the years by implants.Implant retained overdentures have proven to be a major step forward in restoring oral function in edentulous patients. Onlay bone grafting is occasionally indicated to facilitate insertion of endosteal implants in severely atrophic jaws. In this paper, we report a case of a partially dentate patient with a prognathic mandible, incidentally known to have Marfan syndrome. A mandibular body osteotomy of the edentulous mandible following onlay bone grafting was performed and functional rehabilitation was done using implant retained overdenture.

Case Report

A 20 year male patient presented with a chief complaint of missing teeth in upper and lower jaws, and forwardly placed lower jaw since childhood. On examination, patient had excessively long arms and legs, with the patient's arm spanning more than his height. The fingers and toes were long and slender, with hyper mobility. He was a known case of Marfan syndrome.

Extra oral examination revealed long and narrow face with concave profile due to prognathic mandible (Fig. 1). Mouth opening and TMJ movements were within normal limits.

Intra oral examination revealed numerous missing maxillary and mandibular teeth, some partially erupted teeth (Fig. 2), high arched palate, thin knife edged mandibular ridge and Class III malocclusion.

Patients hematological and biochemical investigations were found to be within normal limits.

Radiographic examination included Orthopantamogram, and lateral cephalogram which revealed multiple impacted teeth in mandible, partially erupted multiple teeth in maxilla (Fig. 3) and skeletal Class III malocclusion.

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Fig. 1 Lateral cephalogram showing mandibular prognathism

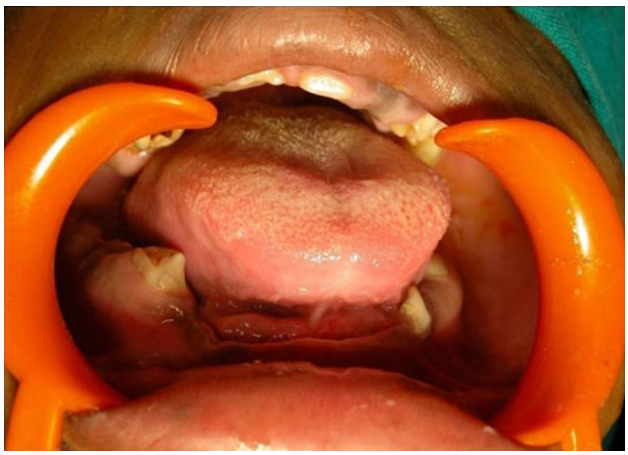

Fig. 2 Intra oral image depicting both the jaws with missing and partially erupted teeth

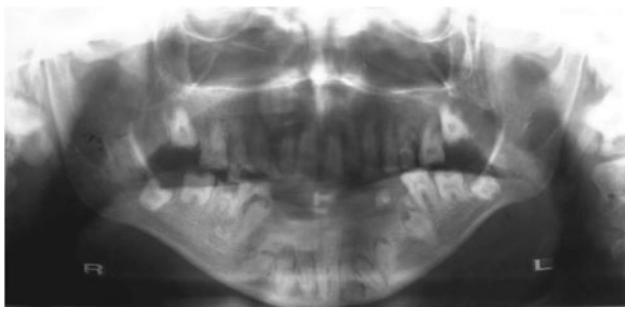

Fig. 3 Multiple impacted teeth seen in maxilla and mandible

Method

A 5 staged treatment was planned based on the specific signs and symptoms of the patient. Surgical exposure of unerupted maxillary teeth, extraction of multiple impacted mandibular teeth, followed by augmentation of mandible with iliac crest corticocancellous onlay bone grafting was carried out. Later, correction of mandibular prognathism by body osteotomy of edentulous mandible and placement of endosseous implants for overdenture and fixed prosthesis in maxilla was also executed.

Surgical Procedure

STAGE 1: Under General Anaesthesia, Surgical exposure of multiple partially erupted teeth of maxilla (Fig. 4) and surgical extraction of multiple impacted teeth in the mandible was carried out (Fig. 5).
Onlay Augmentation of mandible was carried out by Corticocancellous bone graft harvested from medial surface of the anterior iliac crest (Fig. 6). Cancellous bone was placed into the extraction sockets. On top of this onlay monocortical bone was placed to establish a smooth contour (Fig. 7).
STAGE 2: After 6 months of stage 1, Patient was rehabilitated with ceramic Fixed Partial Denture in the maxilla for all the teeth.
STAGE 3: 6 months later, bilateral body osteotomy of the edentulous mandible was performed to correct skeletal Class III malocclusion. Buccal corticotomy

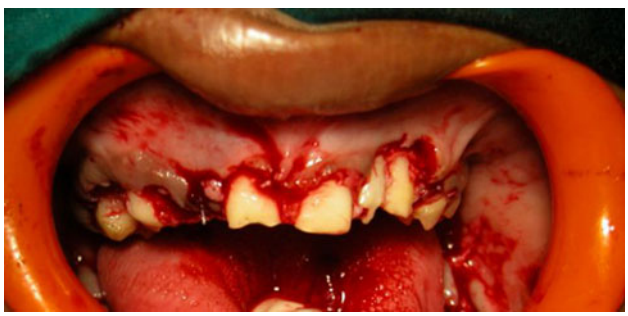

Fig. 4 Exposure of maxillary teeth

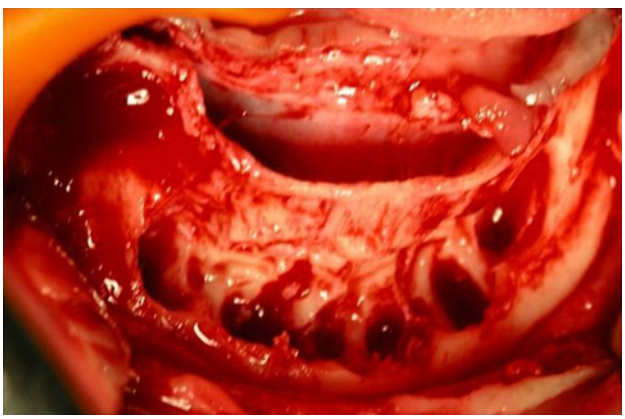

Fig. 5 Surgical removal of impacted mandibular teeth

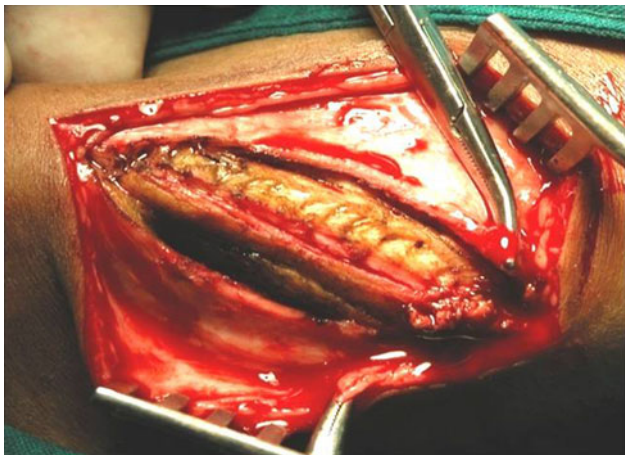

Fig. 6 Iliac crest graft being harvested

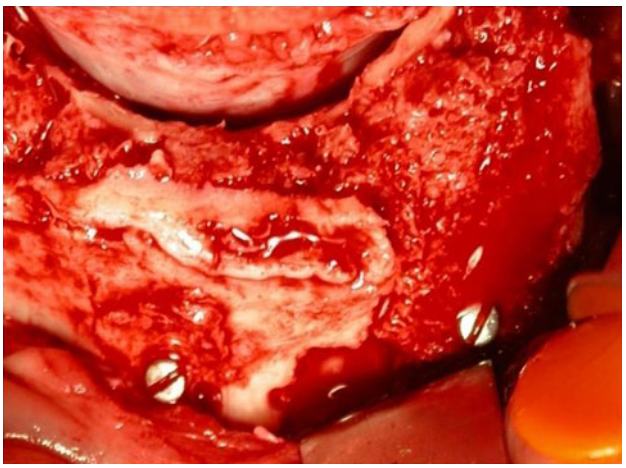

Fig. 7 Cortical plate fixed over cancellous bone

was done and the inferior alveolar neurovascular bundle was identified. Leaving the lower border intact, same procedure was carried out on the contra lateral side (Fig. 8). With the preservation of inferior alveolar neurovascular bundle bilaterally (Fig. 9), the lower border on both sides was osteotomised and 10 mm set back of mandible was achieved. Fixation of mandible was done using 4 hole plates with gap (2 mm).

STAGE 4: After 6 months of stage 3, two endosseous implants were placed in the anterior mandible (Fig. 10).

STAGE 5: Patient was completely rehabilitated by implant retained over denture in the mandible 6 months after stage 4 (Fig. 11).

Discussion

Multiple extractions of the impacted teeth were carried out after discussion with the orthodontist as it was deemed

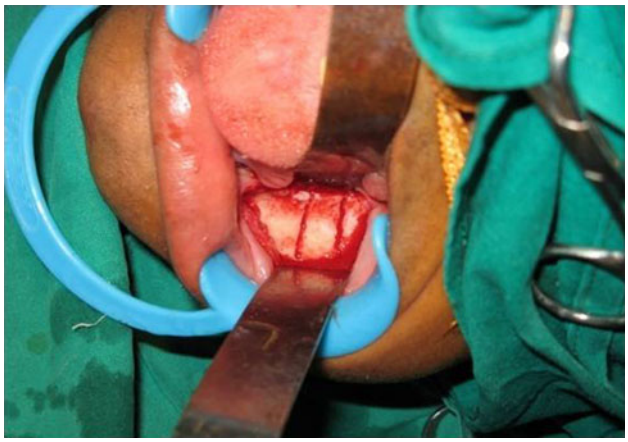

Fig. 8 Mandibular body osteotomy cuts placed

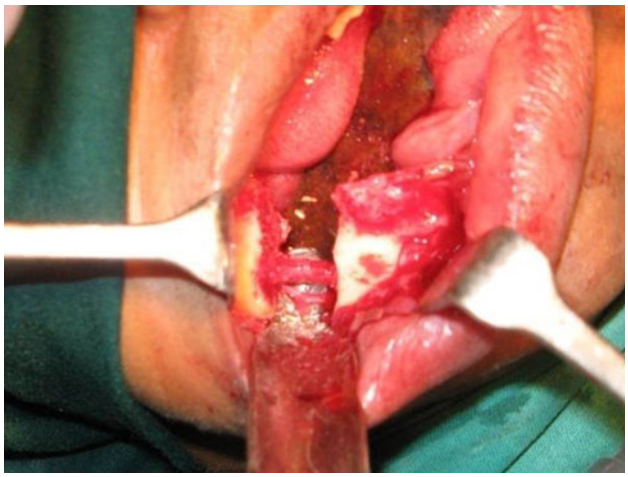

Fig. 9 Intact inferior alveolar neurovascular bundle

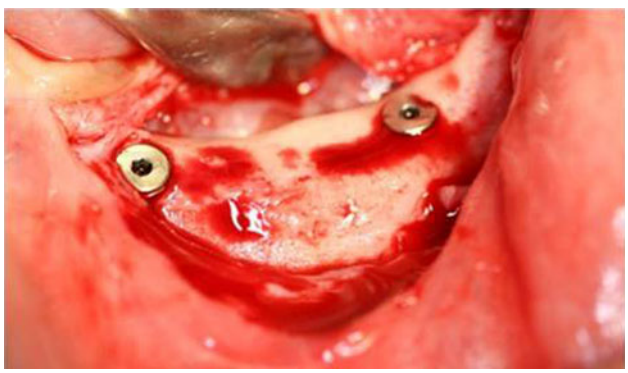

Fig. 10 Implants placed in anterior mandible

impossible to bring the teeth into occlusion orthodontically and corticocancellous bone grafting. During recent decades many surgical techniques have been developed to enlarge the denture-bearing area of the mandible and onlay grafting is one of them. The Iliac crest graft was preferred as it provides excellent corticocancellous struts, it is 'taken up

Fig. 11 Functional rehabilitation with upper FPD and lower implant retained denture

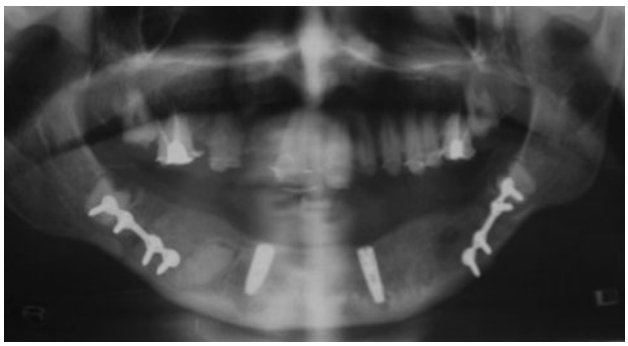

Fig. 12 OPG showing fixed osteotomised segments

well' in the grafted areas and is a generous source of Cancellous bone. Capillary ingrowth occurs rapidly through Cancellous chips and the osteogenic potential of the Cancellous chips themselves ensures the high success rate of this technique of bone grafting [2]. Extraction sockets were filled with cancellous chips and cortical part was used to increase buccolingual width and for smooth contour of the ridge. This provided sufficient bone volume to insert endosteal implants.

Endosseous implants to stabilize overdentures have advantages like Improved function, Improved esthetics and reduced residual ridge resorption [3]. Therefore, the combined use of iliac crest onlay grafts in combination with implant placement has been advocated by several authors [4, 5]. The method described combines the benefits of two techniques: providing sufficient bone volume and inserting endosseous implants of maximal length to provide retention and stability for the lower denture [6].

In the present case body osteotomy of the mandible was preferred over a sagittal split osteotomy in view of thin atrophic ramus. A body osteotomy of the mandible is a poorly described procedure in the literature, given the technical difficulty. It however continues to have its appropriate indications although in limited situations. In this case the difficulty faced was to stabilize the osteotomised fragments as there were no teeth for intermaxillary fixation (Fig. 12). The neurovascular bundle was secured by way of creating a groove in the proximal and distal osteotomised fragments. Post operatively patient did not have any signs of paraesthesia.

Conclusion

Body osteotomy can be carried out uneventfully in the management of a prognathic edentulous mandible and should be given due consideration in selected cases. This case represents combination of various procedures and use of implant retained dentures for functional and esthetic rehabilitation in edentulous patient.

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