Abstract - Long term consequences of not replacing the mandibular molars often results in extrusion of maxillary molars, which precludes the problem of inadequate inter arch space for either a fixed or removable prosthesis. In severe cases a posterior maxillary segmental osteotomy (PMSO) with superior repositioning of the osteotomized dentoalveolar segment to modify and correct the maxillary occlusal plane is an alternative option. This clinical report describes the use of a posterior maxillary segmental osteotomy in gaining interarch space to restore the posterior mandibular segment with dental implants.

Key words: Posterior maxillary segmental osteotomy, Extrusion, occlusal plane, Implants

INTRODUCTION
Long-term clinical sequelae of not replacing the extracted lower molars will often lead to extrusion of maxillary molars. This Extrusion results in insufficient inter arch space for the restoration with fixed or removable prosthesis. If the dentoalveolar extrusion is mild it will require a simple coronoplasty and/or crown lengthening with endodontic treatment. When it is severe extraction of the maxillary molars followed by bone recontouring is necessary. An alternative treatment option for this severe dentoalveolar extrusion is PMSO. This involves the PMSO with superior repositioning of the osteotomized dentoalveolar segment to modify and correct the maxillary occlusal plane. PMSO was introduced by Schuchart (1955) as a two stage surgery to correct the anterior open bite and was then modified by Kufner in to a one-stage procedure. This clinical report discusses the use of PMSO to correct the maxillary occlusal plane and to gain inter arch space for the restoration of mandibular molars with dental implants.

CASE REPORT
A 40 year old healthy woman reported to the department of prosthodontics Ragas Dental College, Chennai with the chief complaints of missing mandibular molar teeth and right maxillary first premolar. On clinical examination there was missing teeth distal to right mandibular premolars and maxillary first premolar. On radiographic examination maxillary second premolar and mandibular first premolar were root canal treated. Periodontal and endodontic status of the remaining teeth were good.

Figure 1: Pre operative condition with reduced interarch space

Diagnostic impressions were made with the irreversible hydrocolloid (Tropicalgin, Zermack, Italy) and the diagnostic casts were mounted in the semi adjustable articulator (Hanau Wide View, Waterpik, USA). The mounted diagnostic casts showed that inadequate interocclusal space for the restoration of either removable or fixed implant supported restoration. Therefore it was decided to increase the interocclusal space between maxillary molar and opposing residual ridge. Periodontal crown lengthening with endodontic treatment of maxillary teeth was contraindicated, because of the possible furcation involvement and inadequate attached gingiva. Patient rejected the option of extracting the supraerupted teeth. The final treatment option selected was to reposition the maxillary segment and restoring mandibular posterior segment with implant supported fixed prosthesis. Supraerupted maxillary segment was sectioned and set into the occlusal plane to obtain adequate interarch space on the mounted diagnostic cast. The artificial teeth were arranged in the mandible edentulous area. Diagnostic waxing was duplicated, and surgical splint was fabricated with clear acrylic resin for the maxillary arch. This surgical splint will be used during and after the surgical procedure to determine the definitive occlusal plane. Surgical guide for the placement of dental implants was fabricated using the diagnostic setup. PMSO was performed under general
anesthesia with nasotracheal intubation. A vestibular incision was made with 5mm superior to the mucogingival junction and extended forward to provide good exposure. Horizontal bone cut was made 5mm above the root apices with thin fissure bur. Anterior vertical bone cut was made at the missing maxillary right first premolar region. Posterior bone cut was performed behind the tuberosity. Greenstick fracture was made on the palatal aspect by downward application of external pressure. Under continuous irrigation, bone was removed along the horizontal cut in order to obtain necessary rotation to compensate for the extrusion. Subsequently maxillary palatal bone was removed through the maxillary antrum. Mobilized segment was verified for its correct position with surgical splint and fixed with titanium miniplate and screws. Mucosa was closed with Non-absorbable sutures (Ethicon, Johnson and Johnson Ltd., Aurangabad, India) [Figure.2].

Figure 2: Occlusal plane corrected with posterior maxillary segmental osteotomy
Two Dental implants 4.2mmx10mm (Adin dental implant system Ltd., Alone Tavor, Israel) were placed using the prefabricated surgical guide and were left submerged beneath the tissues for two stage procedure. Approximately after 3months implant uncovering surgery was performed after three months. Implant stability was verified with the resonance frequency analyzer (Ossstell™ mentor, Ossstell AB, Goteborg, Sweden) and the implant stability quotient was recorded as 78. Bone union of the mobilized segment was also verified with the radiograph. (Lateral cephalogram) Two weeks after the stage two surgery, tooth preparation was done on right maxillary canine, right maxillary second premolar for the tooth supported fixed partial denture. Impressions of the maxillary and mandibular arches were made with polyether impression material (Impregnem, 3EMSPE.USA) A cement retained metal ceramic fixed partial denture was fabricated with Cobalt-Chromium alloy and cemented with polycarboxylate cement [Figure.3]. Group function occlusal scheme was established with maximal intercuspation and no contact in lateral excursion. Patient was followed up with 3 months intervals up to 8 year without any complications. Patient was pleased with esthetic and functional outcome.

Figure 3: Post operative - Restored with implant and fixed dental prosthesis

DISCUSSION
PMSO offers the advantage of precisely controlling the level of occlusal plane by means of surgical splint. It reduces the overall treatment cost and duration, when it is compared with other treatment options like orthodontic intrusion and extraction of extruded segment followed by replacement. Anterior vertical bone cut was favorable in this case since it was involving missing right maxillary first premolar. Root resorption of site adjacent to the osteotomy has been documented. There were no signs of devitalisation and root resorption adjacent to the site of osteotomy during the eight years follow up period. However regular clinical and radiographic follow up are advisable to perform an endodontic treatment when it is required.

REFERENCES

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