

Modification of Hyrax Expansion Screw to Be Used as an Intro-Oral Distractor for Anterior Maxillary Distraction in a Patient with Cleft Lip and Palate: A Case Report

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Abstract : Introduction: Patients with Cleft lip and palate (CL/P) can present with a maxillary retrusion after cleft repair. Anterior Maxillary distraction osteogenesis (AMD) is a technique that provides simultaneous skeletal advancement and expansion of the soft tissues related to an anterior segment of the maxilla. This case presented is a case of AMD. The advantage of this technique is that the occlusion in the posterior segment can be maintained, and only the segment in cross bite is advanced for correction of the midfacial deficiency. The other alternative treatment is anterior movement by a Lefort 1 osteotomy. When a Lefort 1 osteotomy is compared with the Distraction osteogenesis or AMD, the disadvantages of the Le Fort 1 include a higher risk of morbidity, requirement of fixation, relapse tendency and unexpected changes in the nasal form. These complications were eliminated by AMD technique. This was followed by placement of the implant in the bone formed after AMD. Hence complete surgical, orthodontic and prosthodontics rehabilitation of the patient was done by an interdisciplinary approach. Methods: Patient presented with repaired UCL/P of the right side with midfacial retrusion. Intra-oral examination revealed a good occlusion in the posterior arch and anterior Crossbite from canine to canine. Patient's both maxillary lateral incisors were missing. The lower arch was well aligned with all teeth present. The study models when scored according to GOSLON yardstick received a score of 4. After pre-surgical orthodontic phase was completed an intraoral distractor was fabricated by modification of HYRAX expansion screw. After surgery, low subapical osteotomy cuts were placed and the distractor was fixed. The latency period of 5 days was observed after which the distraction was started. Distraction was done at a rate of 1 mm/day with a rhythm of 0.5mm in morning and 0.5mm in the evening. The total distraction of 12 mm was done. After a consolidation period, the distractor was removed, and retention by a removable partial denture was given. Radiographic examination confirmed mature bone formation in the distracted segment. Implants were placed and allowed to osseointegrate for approximately 4 months and were then loaded with abutments. Results: Total distraction done was 12mm and after relapse it was 8mm. After consolidation phase the radiographic examination revealed a B2 quality of bone according to the Misch's classification and sufficient height from the maxillary sinus. These findings were indicative for placement of implants in the distracted bone formed in premolar region. Implants were placed and after radiographic evidence of osseointegration was seen they were loaded with abutments. Thus resulting in a complete rehabilitation of a cleft patient by an interdisciplinary approach. Conclusion: Anterior maxillary distraction can be used as an alternative method instead of complete distraction osteogenesis or Lefort 1 advancement of maxilla in cases where the advancement needed is minimum. Use of HYRAX expansion screw modified as intra-oral distractor can be used in such cases, which significantly reduces the cost of treatment, as expensive distractors are not used. This technique is very useful and efficient in countries like India where the patient cannot afford expensive treatment options.

Keywords : cleft lip and palate, distraction osteogenesis, anterior maxillary distraction, orthodontics and dentofacial orthopaedics, hyrax expansion screw modification

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