

**Research Article**

## **WIDENING THE SCOPE OF CLEFT MANAGEMENT WITH SLOW EXPANSION**

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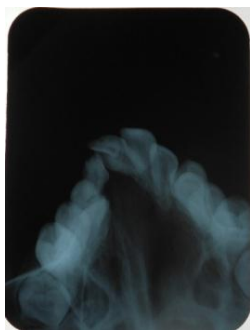
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### **ABSTRACT**

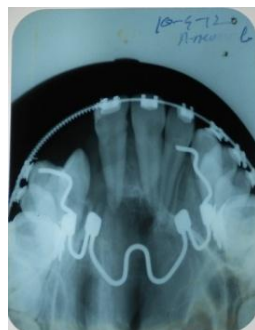
Arch widening followed by bone graft in adult unilateral cleft palate cases with presurgical orthodontic requirements in bone grafting are discussed here.

**Key Words:** *Unilateral Cleft Palate, Arch Expansion, Bone Graft, Presurgical Orthodontic Requirements, Cleft Management, Widening*

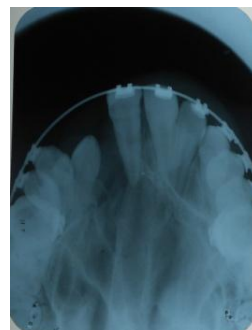
**INTRODUCTION** Patients may present with a unilateral or bilateral defect involving the palate, lip and/or alveolus. Adult unilateral cleft palate cases, with presurgical orthodontic requirements for bone grafting will be discussed here in this article.



**Figure 1: pre treatment**



**Figure 2: after expansion and alignment**



**Figure 3: post expansion and bone graft**



**Figure 4: Four months after bone graft**

Due to multiple soft tissue and hard tissue considerations, the maxillary arch is constructed in the unilateral cleft patients. One of the published studies Suja *et al.*, (2012) of the same author on the cleft palate patients in Kerala shows that the maxillary dental arch dimensions in unilateral cleft are different from that of the normals. Hence arch expansion is almost always a part of the general treatment protocol in the management of the unilateral cleft palate. This is almost always followed by bone grafting, to normalize the facial and dental functions.

### **MATERIAL AND METHODS**

Different methods and appliances for expansion are available for the management of transverse discrepancies in the cleft patient. The quadhelix, the coffin spring, the RME (Rapid Maxillary Expansion, eg: hyrax), the niti expander etc are some of the examples in expansion aids.

By arch expansion an additional amount of space is made available in the cleft region for placement of the graft as a presurgical orthodontic procedure. A normal arch form and an optimal positioning of the cuspid tooth are of utmost importance when obtaining a successful bone graft.

According to Profitt (1993), 7-10 years is the best time to place the graft. According to Waite and Waite Peter D and Daniel (1996), 9-11 years is the ideal age. But this is not always possible, especially in the

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conditions prevailing in Kerala, as is evident from the adult untreated cases reporting to the Department of Orthodontics at the Govt: Dental College, Thiruvananthapuram.

Bone grafting favors the post surgical orthodontic treatment; it provides a bony region through which the teeth can erupt; to favor the general alignment of teeth. Generally, autogenous bone grafts are preferred for grafting. Different sources of autogenous bone grafts are the iliac crest, rib, and the calvarium, out of which the Iliac crest bone graft is the most preferred and the best source, in terms of post operative bone graft acceptability.



Figure 5: pre treatment



Figure 6: after expansion and alignment



Figure 7: after expansion and alignment- without expander

It has been cited Peter and Daniel, (1996) in literature that the canine erupts through the graft in 4-6 weeks, and that the Orthodontic tooth movement through the bone graft is usually possible 1-3 months after the bone graft. Periapical radiographs are valuable aids in determining the bone around the teeth.

## DISCUSSION

Extra oral and Intra oral forces are used in orthodontics to aid treatment plan. The expansion achieved in orthodontic non cleft cases has been a motive to employ it in cleft cases too.

The transverse expansion of the maxillary arch (intra oral forces) can be derived from a variety of orthodontic appliances. Many studies were attempted to discern changes in several measures of transverse expansion, which are influenced by varying the type of appliance and the amounts of force delivered. eg: coffin spring, quadhelix, NiTi expander etc. The previous surgeries, eg: of the palate, undergone by the patient also influence the transverse dimension of the maxilla. The age, maturational status, sex and facial morphology influence the effect of treatment. Whether the early intervention in the transverse dimension was worth the effort was examined by James Mc Namara (2002); James (2002).

b) Transverse expansion in adult cleft patients:

In the cleft sample, The mean maxillary inter canine width, inter premolar width and the inter molar widths for the males was  $33.07 \pm 4.13$ ,  $35.32 \pm 3.35$ , and  $50.97 \pm 2.23$  respectively; for the females was  $33.19 \pm 6.29$ ,  $40.60 \pm 5.48$ , and  $51.39 \pm 6.54$  respectively as reported in an earlier study (Suja *et al.*, 2012), and the maxillary dental arch dimensions in unilateral cleft are different from that of the normals. Arch expansion is needed in most of these cases. Even the mandibular dental arch length dimensions in maxillary unilateral cleft sample are different from that of the normals in the non cleft side, as reported in another study (Suja *et al.*, 2012); it is less for the cleft sample when compared with the normals.

The niti expander can be employed successfully in adult cleft palate patients prior to bone grafting. Widening prior to graft placement in the cleft region is preferable than placing the graft over a smaller area. The radiographs (figure 1 to figure 2) show the widening achieved in the cleft region for a patient whose post surgical intra oral radiographs are shown in figure 3 and figure 4. The intra oral photographs are shown in Figure 5 to figure 7. (This is of a case done in the dept: of Orthodontics, Govt: Dental College, Thiruvananthapuram during latter half of 2011 to mid 2012, for arch expansion, alignment; and bone grafting was done in mid 2012, in the plastic surgery department of Govt: Medical College, Thiruvananthapuram. Figure 4 (Xray) was taken 4 months after surgery in September 2012).

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### **Conclusion**

Arch expansion followed by bone graft in adult cleft palate patients, aid our attempts for a favorable arch form, alignment, for improvement of dental function and esthetics.

Long term stability (Suja *et al.*, 2012; Raed *et al.*, 1995) in palatal expansion has been a topic of interest in orthodontics. The Long term stability in palatal expansion following bone graft in cleft palate is yet to be evaluated for our population, in the orthodontic perspective.

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