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## CASE REPORT

### TREATMENT OF A SKELETAL CLASS III MALOCCLUSION USING ALTERNATE RAPID MAXILLARY EXPANSION AND CONSTRICTION (ALT-RAMEC) PROTOCOL AND FACEMASK- A CASE REPORT

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#### ABSTRACT

Alternate rapid maxillary expansion and constriction (Alt-RAMEC) is a very effective procedure before facemask therapy as it loosens the palatal suture very efficiently and prevent unnecessary over-expansion of maxilla. A 12 years old patient reported with retrognathic maxilla with anterior crossbite. Posterior arch width was normal. Alternate rapid maxillary expansion and constriction was done followed by facemask therapy. Forward movement of maxilla has occurred. After skeletal correction fixed mechanotherapy was carried out to correct minor dental discrepancy.

## INTRODUCTION

The prevalence of class III patients is 0%- 26% in various populations with lots of variety (Hardy, 2012). It may be due to prognathic mandible, retrognathic maxilla or combination of both (Litton, 1970). Treatment plan also varies in growing and non growing patients. Patients with retrognathic maxilla in growing phase are treated by using rapid maxillary expansion to loosens the palatal suture followed by face-mask therapy to protract the retrognathic maxilla( Turley, 1988; Baccetti, 1998). But one of the main adverse effect of palatal expansion before facemask therapy is unnecessary over-expansion of palate where there is no need of expansion (Haas,1980). That over expanded maxilla is very difficult to correct and also very time consuming. In case of alternative rapid maxillary expansion and constriction protocol or alt-RAMEC given by Liou, maxilla is expanded and constricted alternatively(Liou,2005). So there is no chance of unnecessary over-expansion. Also this procedure loosens the palatal and circumaxillary suture very effectively than conventional RME (Wang, 2009).

**Case report:** A 12 years old male patient reported to the Dept with chief complaint of depressed upper jaw. On extra oral examination he had leptoprosopic face with retrognathic maxilla, orthognathic mandible (Fig-1).

On intra-oral examination he had class-III molar relation, anterior crossbite, crossbite on left posteriors, mild crowding in anteriors. There was overjet of -1 mm and overbite of 4 mm (Fig-2).The upper and lower arch width was normal. Lateral cephalogram showed maxilla was retrognathic (Fig-3). OPG showed no noticeable abnormality. (Fig- 4)

**Treatment progress:** In this case if the upper arch would have been expanded excessively by conventional RME, after facemask therapy when the maxilla would come forward, there would be posterior scissor-bite. So Alt-RAMEC protocol was chosen for this case to prevent unnecessary over-expansion of maxilla. Hyrax expander was given to loosen the suture following this protocol. Occlusal radiograph was taken. (Fig - 5). In first week the appliance was expanded 1mm per day for 7 days. Then in the subsequent week the appliance was constricted for 7 days. This procedure was followed for 9 weeks according to protocol (Liou, 2005). After expansion, the appliance was sealed and facemask therapy had been started (Fig-6). Patient was advised to wear the appliance for 12-14 hours. Facemask therapy was continued for 7 months. Anterior crossbite got corrected (Fig-7). After the occlusal settling, fixed mechanotherapy was started in MBT mechanotherapy in 0.022" X 0.028 "slot. The case was started in 0.014 "round NiTi followed by 0.016" round NiTi. Proximal stripping had been done on 14 to correct mild crowding in upper arch. After round NiTi 17" X25" rectangular NiTi was placed followed by 17" X25" and 19" X 25" rectangular ss. Then 0.014 "round ss was placed for final occlusal settling.

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**Fig. 1. Pre-Treatment Extra-oral Photograph**



**Fig 2. Pre-treatment intra-oral photograph**



**Fig-3: Pre- Treatment Lateral Cephalogram**



**Fig 4. Pre Treatment OPG**

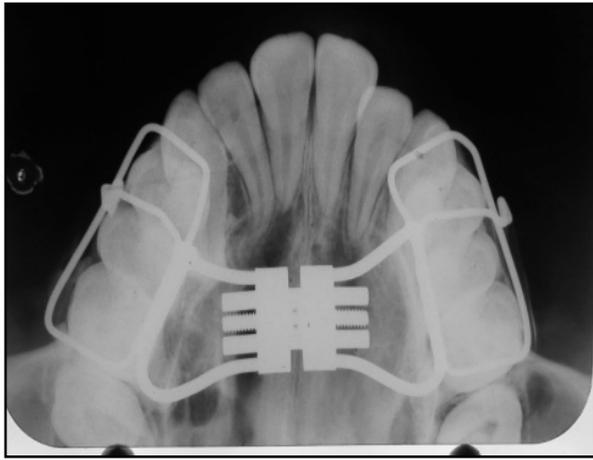


Fig 5. Upper Occlusal radiograph with HYRAX

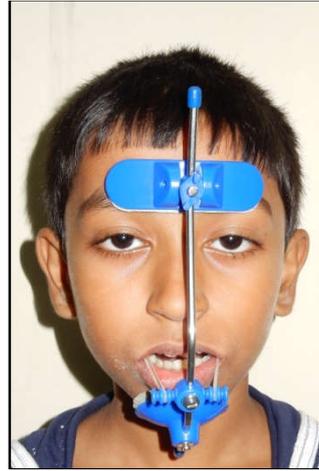


Fig 6. Patient with facemask



Fig 7. Post Facemask intra-oral photography



Fig 8. Post Treatment Extra-oral Photograph



Fig 9. Post Treatment Intra-oral Photograph



Fig -10: Post Treatment Lateral Cephalogram



Fig-11. Post treatment OPG

## RESULTS

Hypoplastic maxilla has been corrected with improvement of facial profile (Fig-8). Anterior crossbite got corrected. Mild crowding in upper and lower anteriors was relieved with establishment of class I canine guided occlusion. Post treatment overjet and overbite was 2mm (Fig-9). Post treatment lateral cephalogram showed maxilla has come forward (Fig 10). Pre and post lateral cephalometric analysis showed in table 1. OPG showed no noticeable root resorption (Fig-11).

Table 1. Lateral cephalometric analysis

Parameter	Mean	Pre treatment	Post Treatment
AB Plane to NPog	0° to -9° (-4.6°)	+1°	-5°
SNA	82°	76°	80°
SNB	80°	80°	78°
ANB	2°	-4°	+2°
Wit's Appraisal	-2mm to +2mm	-4mm	+1mm
Pog -Na perp	Small -8 to -6mm Medium -4 to 0 mm Large -2 to +2 mm	+3mm	+2mm
Na perp to point A	0-1 mm	-2mm	+2mm

## DISCUSSION

Treatment of class III is a brain teaser to the orthodontists. Amongst them growth modification is one of the difficult one.

It depends on several factors like age, patients' growth rate, compliance etc. So to get a good result from orthopedic appliance is very difficult. Before facemask therapy, the palatal and circumaxillary suture have to be loosened to protract the maxilla properly. One of the recent effective expansion procedures is Alt-RAMEC. It not only loosens the sutures very effectively but also protracts the maxilla more than conventional RME (Isci, 2010).

A 12 years old patient reported with retrognathic maxilla as indicated by SNA 76°, Na perp. to point A -2 mm, ANB -4° and Wits appraisal -4 mm. Alt-RAMEC procedure had been started. After 9 weeks facemask was given. After successful maxillary protraction, fixed orthodontic therapy was started for minor dental corrections. After orthodontic treatment, maxilla got protracted as indicated by SNA 80°, NA perp to point A +2 mm, Wits appraisal +1 mm. Mandible got slightly retrognathic as SNB changed from 80° to 78°. Over all facial profile improved and canine guided occlusion was established.

## Conclusion

Alt-RAMEC is a revolutionary procedure in the field of Orthodontics. It not only prevents unnecessary over-expansion but also loosens the suture properly and gives a harmonic and esthetic result to the patients.

**Conflict of interest:** None

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