www.jmscr.igmpublication.org
Index Copernicus Value: 79.54
ISSN (e)-2347-176x ISSN (p) 2455-0450
crossrefDOI: https://dx.doi.org/10.18535/jmscr/v7i2.34

IGM Publication
Journal Of Medical Science And Clinical Research
An Official Publication Of IGM Publication

Case Report

Face Mask with ALT RAMEC- A Case Report

Authors
Krishna Kishore.R[1], Jeevan.M[2*], Pradeep.K[3], Anoosha.M[4], Padma Priya.CV[5] Praveen Varma.D[6]
[1]Private Practitioner
[2]Post Graduate Student, Department of Orthodontics, Vishnu Dental College, Bhimavaram, Andhra Pradesh
[3]Senior Lecturer, Department of Orthodontics, Vishnu Dental College, Bhimavaram, Andhra Pradesh
[4]Head of the Department, Department of Orthodontics, Vishnu Dental College, bhimavaram, Andhra Pradesh
[5]Professor, Department of Orthodontics, Vishnu Dental College, Bhimavaram, Andhra Pradesh
*Corresponding Author
Dr M. Jeevan Kumar
Department of Orthodontics, Vishnu Dental College, Bhimavarm, Andhra Pradesh, Pin code: 534202
Email: *jeevankumarmds@gmail.com*

Abstract
Early intervention is associated with better patient compliance will provide better orthopedic response in skeletal class III malocclusion. However, treatment in the mixed or permanent dentition can produce favorable results, so The collaborate use of rapid maxillary expansion and facemask has been a contemporary technique for the maxillary protraction in growing patients with Class III and there is a assumption that the rapid maxillary expansion opens the circumaxillary sutures and facilitates maxillary protraction. It has been reported that the amount of maxillary protraction was 5–6 mm in 5 months under the protocol of alternate rapid maxillary expansions and constrictions (Alt-RAMEC) and was significantly more than rapid maxillary expansion. It was because Alt-RAMEC opened the circumaxillary sutures more extensively than rapid maxillary expansion. This article highlights the combined use of facemask with Alt-RAMEC to treat midface deficiency in growing patients.
Keywords: *Skeletal class III, growing patients, Alt-RAMEC.*

Introduction

Alternate rapid maxillary expansion and constriction (ALT-RAMEC), The ALT-RAMEC protocol was developed by Liou and Tsai[1] in 2005 for disarticulating circummaxillary sutures without overexpansion.

The Alt-RAMEC protocol helps in opening of the maxillary sutures more extensively than conventional expansion. Several authors in the last 5 years investigated the outcomes of the Alt-RAMEC protocol combined with facemask (ALT-RAMEC/FM) in Class III patients; data derived from these surveys stated that there is a significant

difference between the two treatment protocols. Isci et al[2.] Found a greater maxillary advancement with the activation–deactivation protocol than the conventional RME/FM protocol.

Case History

A 12-year-old female reported with chief complaint of forwardly placed lower front teeth. On extraoral examination, she had a straight facial profile characterized by a maxillary retrusion. Intraoral examination revealed an anterior crossbite with a reverse overjet of 2 mm & overbite of 3 mm (Fig:1). There is no anteroposterior centric relation discrepancy on closure & the transverse width was within normal limits. The maxillary & mandibular midlines are centered in the face. The molar relationship is Class III on left side & super class III on right side & there is mild spacing in both the maxillary and mandibular arches with unerupted lower left second premolar. patient had SNA, SNB of 76^0 & 78^0 with an ANB angle of -2^0, upper incisor to NA was 24^0 & lower incisor to NB was 30^0, increased mandibular length with average to horizontal growth pattern (SN-Go Gn = 28^o, FMA = 22^o), therefore patient was dignosed as skeletal class III. Treatment plan was to correct the maxilla in both transverse and sagittal plane. ALTRAMEC was chosen because of the evidence that it opened the circummaxillary sutures more extensively than rapid maxillary expansion[3]

Treatment progress

Initially expansion was done with hyrax for one week i,e., the sagittal split screw was activated twice a day with 90° turns (Fig: 2a). After one week of expansion, the split screw was reactivated for a week of compression. Since the maxilla was not too narrow, the ALT-RAMEC protocol was conducted for eight weeks with the fourth constriction phases.

After eight weeks of Phase I treatment, the maxilla was sufficiently expanded with normal transverse relation, and facemask(Petit) (Fig: 2b) therapy was given for six months, protraction force of 400g was applied on each side from elastics which are connected to the facemask with downward and forward force vector having an inclination of 20^0–30^0 to the occlusal plane. Patient was instructed to wear the facemask for 8 hours per day. Traction was continued for 8 months until sufficient clinical movement of the maxilla has achieved to improve the midface esthetics. (Fig: 2c)

A fixed orthodontic treatment was initiated with pre adjusted Edgewise appliance (slot = 0.022 x 0.028-in), and 0.014, 0.016, 018, 017x025- inch NiTi & 19x25ss wires were used for leveling & alignment. (Fig: 3) After leveling & alignment, finishing and detailing was done with 0.16 SS wires in the upper and lower arches. Settling elastics were given to improve the intercuspation. The treatment was completed in 20 months and fixed bonded retainer was placed in the upper and lower arches. After the treatment, there was marked maxillary forward movement was seen with improvement of profile. Anterior crossbite was corrected and proper overbite and overjet were established. Post treatment Lateral cephalogram suggested improvement in the profile (Fig: 4) & retention was carried out with bionator. (Fig: 5)

Fig. 1: 12 year old female patient with Class III malocclusion with subdivision on right side before treatment.

Fig.2a: ALT-RAMEC with hyrax appliance.

Fig.2b: Petit facemask therapy.

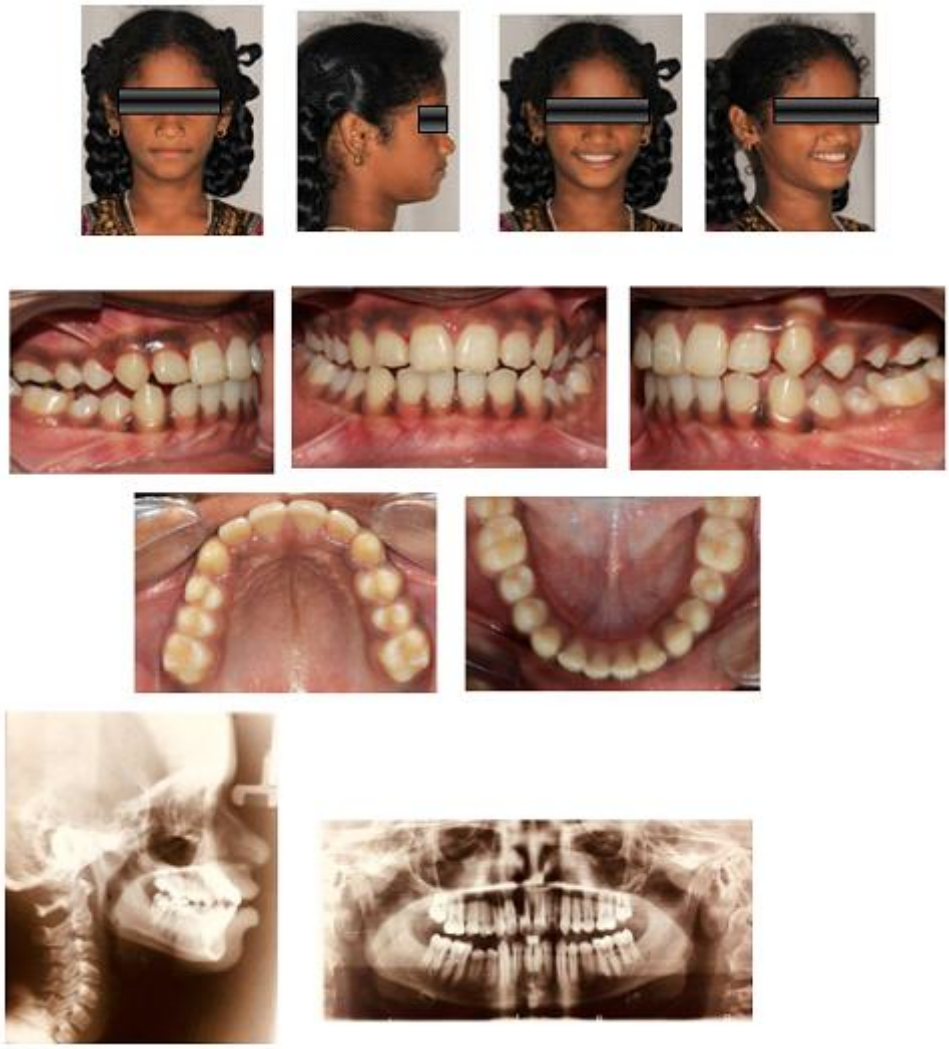

Fig: 2c After facemask therapy

Fig.3 Strap up was done with 016 niti for both the arches

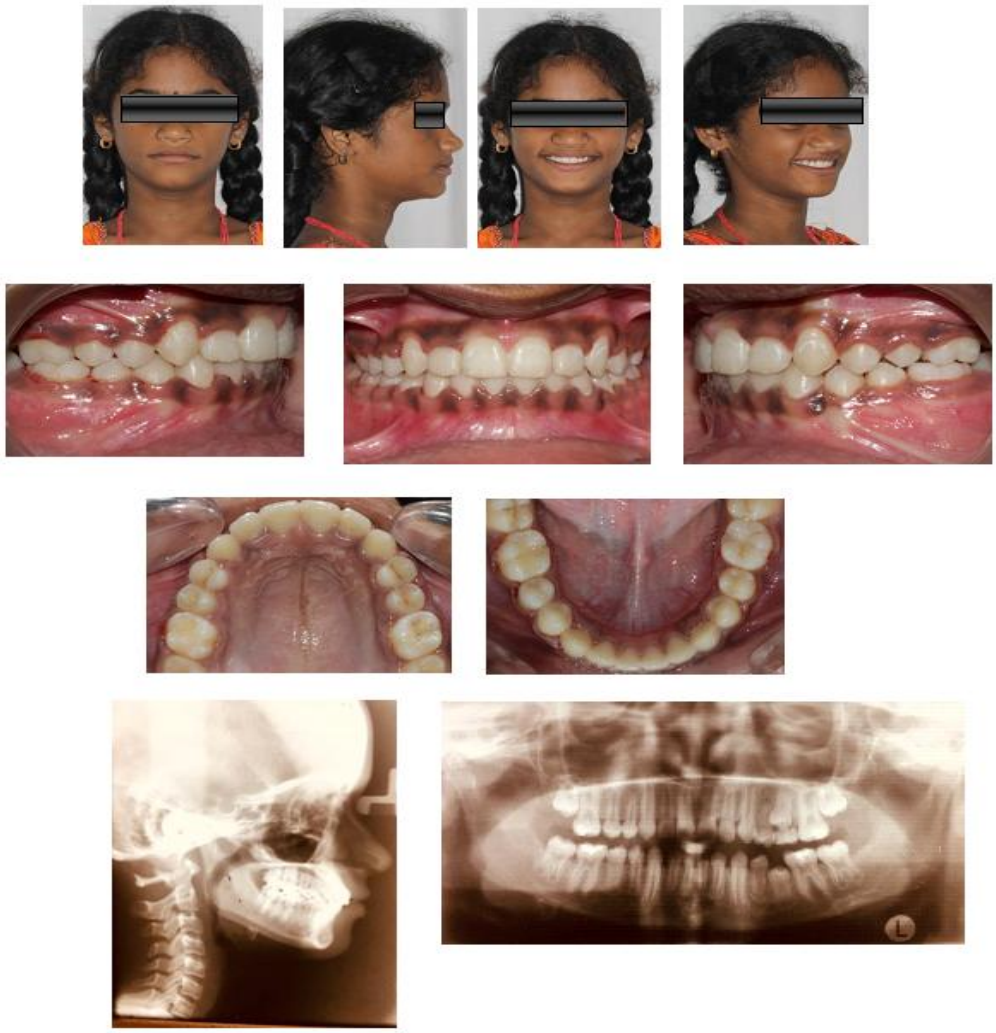

Fig.4: After facemask therapy

Fig.5 Retention with bionator

Comparison of pre and post cephalometric values are presented in the table below (table I)

Table I: Cephalometric values

Parameters	Pre Treatment	Post facemask	Post Treatment
SNA degree	76	80	80
SNB degree	78	78	78
ANB degree	-2	2	2
N perp.to POINTA	-4	-1	-1
NB to pog mm	4	4	4
FMA degree	22	26	26
LAFHmm	56	60	61
Angle of inclination degree	85	87	87
U1 to N-A mm	3	5	6
U1to SN degree	108	116	117
U1to NA degree	24	28	29
L1 to N-B mm	6	7.5	7.5
L1 to N-B degree	31	32	32
Inter incisal degree	110	114	115
L1 to MP degree	101	105	105
L1 to A Pog mm	5	6	6
S-line mm Upper lip Lower lip	 0 4	 3 3	 3 3

Discussion

Class III patients have an unfavorable facial appearance, which may affect their psychological status. Therefore, the improvement of facial esthetics is an important factor in patients.

Facemask therapy is routinely used along with Rapid maxillary expansion (RME) to take advantage of the expected stimulation of the midpalatal sutures. It has been stated that facemask therapy should be initiated at early ages because sutures will close and only dental changes rather than skeletal changes are attained in older age. Hence the ALT-RAMEC protocol was developed for disarticulating circummaxillary sutures without overexpansion. Liou's[1]ALT-RAMEC protocol was designed to maintain this sutural stimulation over a longer period, thus achieving greater intensity of maxillary protraction.

The treatment of our patients with facemask and ALT-RAMEC protocol is to get more positive reactions to the protraction force. Baik et al.[4] reported that more amount of maxillary advancement is achieved when the facemask was applied in conjunction with ALT-RAMEC whearas Burstone and Marcotte[5] concluded that forward movement of the maxilla was small and rarely more than 1–2 mm.

In the present case, SNA had increased 4^0, suggesting that significantly greater increase in the sagittal position of the maxilla with respect to cranial base. Westwood et al.[6] In a study on the effects of conventional RME/FM therapy for Class III malocclusion found similar results inducing significant improvement in anterior movement of the maxilla (SNA +1.6°). The maxillary palatal plane angle was tipped 2^0 in an anticlockwise direction despite the 30^0 downward and forward pull of the facemask to counteract such a rotational effect. This is acceptable when protraction is carried out along the occlusal plane below the center of resistance of the maxilla[7]. Long term studies[8] with protraction facemask have shown that this effect is common with the palatal plane and returns to normal inclination in few years after completion of maxillary protraction.

Increase in the FMA angle and lower anterior face height increased by 4^0& 4 mm respectively, and the results are similar to those reported by other investigators[9] and is caused by the downward movement of the maxilla and downward and backward rotation of the mandible.

In the present case, forward movement of the maxilla, associated with slight mandible rotation, resulted in a reduction of profile concavity, the

soft tissue effects were more marked for the upper lip than for the lower lip. Forward movement of the upper lip resulted from maxillary protraction with mild maxillary incisor proclination. Lower lip position did not change after treatment. Ngan et al[10] observed changes in soft tissue profile accompanied by forward movement of the upper lip and backward movement of the lower lip, various soft tissue changes combined to improve the patient's class III profile. In this case patients profile has become more convex due to forward movement of the upper lip and retraction of the lower lip. Soft tissue pogonion moved back and menton moved down as described by Kapust et al[11].

With the use of facemask/ALT-RAMEC therapy, Skeletal changes has been achieved primarily as a result of anterior and vertical movement of the maxilla. Significant changes in mandible position also contributed to the class III correction.The downward and backward movement of the chin expressed in this patient is similar to results has described by Nartallo-Turley et al using palatal expansion with a facemask[12].

Conflict of Interests: The authors do not have any conflict of interest to declare.
Prior publication: nil
Support: nil
Permission: nil

Reference

1. Liou EJ, Tsai WC. A new protocol for maxillary protraction in cleft patients: repetitive weekly protocol of alternate rapid maxillary expansions and constrictions. Cleft Palate Craniofac J. 2005 Mar;42(2):121-7
2. Isci D, Turk T, Elekdag-Turk S. Activation – deactivation rapid palatal expansion and reverse headgear in Class III cases. Eur J Orthod 2010;32:706–15
3. Liou EJ. Toothborne orthopedic maxillary protraction in Class III patients. J Clin Orthod. 2005;39:68–75.
4. Baik HS. Clinical results of the maxillary protraction in Korean children. American Journal of Orthodontics and Dentofacial Orthopedics. 1995 Dec 1;108(6):583-92.
5. Burstone CJ, Marcotte MR, Taylor TD. Problem solving in orthodontics: Goal-oriented treatment strategies. Chicago, IL: Quintessence; 2000 Oct 1.
6. Westwood PV, McNamara JA Jr, Baccetti T, Franchi L, Sarver DM. Long-term effects of Class III treatment with rapid maxillary expansion and facemask therapy followed by fixed appliances. Am J Orthod Dentofacial Orthop 2003;123:306-20.
7. Wang YC, Chang PM, Liou EJ. Opening of circumaxillary sutures by alternate rapid maxillary expansions and constrictions. Angle Orthod 2009;79:230–4.
8. Hiyama S, Suda N, Ishii-Suzuki M, Tsuiki S, Ogawa M, Suzuki S, Kuroda T. Effects of maxillary protraction on craniofacial structures and upper-airway dimension. Angle Orthod. 2002;72: 43–47
9. Takada K, Petdachai S, Sakuda M. Changes in dentofacial morphology in skeletal Class III children treated by a modified maxillary protraction headgear and a chin cup: a longitudinal cephalometric appraisal. Eur J Orthod. 1993;15: 211–221.
10. Ngan, P.; Yiu, C.; Hu, A.; Hägg, U.; Wei, S.H.; and Gunel, E.: Cephalometric and occlusal changes following maxillary expansion and protraction, Eur. J. Orthod. 20:237-254, 1998..
11. Kapust AJ, Sinclair PM, Turley PK. Cephalometric effects of face mask/expansion therapy in Class III children: a comparison of three age groups. Am J Orthod Dentofacial Orthop. 1998;113:204–212.
12. Nartallo-Turley PE, Turley PK. Cephalo-metric effects of combined palatal expansion and facemask therapy on Class III malocc-lusion. Angle Orthod. 1998;68:217– 224.