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RESEARCH ARTICLE

EARLY MANAGEMENT OF SKELETAL CLASS III MALOCCLUSION WITH DECIDUOUS DENTITION ANCHORAGE- 2 YR CLINICAL FOLLOW UP

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ABSTRACT

Class III malocclusion continues to be one of the most challenging problems confronting orthodontist and paediatric dentists owing to its unpredictable and unfavourable growth pattern. Although early orthopaedic intervention is recommended but still it is not customarily used because of poor patient compliance and convoluted appliance therapy. The following case report describes management of a 5-year old male patient in deciduous dentition with developing class III malocclusion by modified occlusal splint along with facemask. Improved patient compliance with this new appliance enabled correction of malocclusion in 6 months and encouraging favourable skeletal growth for future.

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INTRODUCTION

Class III malocclusion constitutes a very small proportion of malocclusion with its prevalence varying from 0.3-3.5% among Indian children of 8-15 years of age (Kharbanda, 1993 and Kharbanda, 1991). Individuals with class III malocclusion either present with discrepancies limited to dentoalveolar component or may appear along with skeletal component as well. Hereditary along with environmental factors play a significant role determining extent of severity of the malocclusion (Litton, 1970). The characteristic features are seen at an early age usually between 3-5 years of age and instead of getting self corrected, its severity worsens with age. Conspicuous dental and skeletal features resulting in unpleasant aesthetics for the child and thus lead the parents to seek orthodontic treatment at an early age. Early orthopaedic treatment of class III in deciduous and early mixed dentition has been advocated with the goal of providing a favourable environment for normal growth and improving psychological development of the child. Correction utilising facemask or reverse headgear for maxillary deficiency and chin cap for mandibular prognathism are well documented (Guyer, 1980). Even though recommended yet the concept of early intervention in class III malocclusion is not fully embraced because of its dependency of parent and children's compliance along with cumbersome appliance design. Klemper reported application of Tandem appliance in early treatment (Klemper, 2003). However, literature still lacks report of management of class III malocclusion in deciduous dentition. This case report describes the management of 5 year old male child with class III malocclusion in deciduous dentition stage using modified occlusal splint and facemask.

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Case Report

A 5 year old growing male patient reported to the clinic with chief complaint of lower front teeth overlapping the upper teeth. Family history was not contributory. Extra-oral examination revealed mesoprosopic face with mild concave profile and slightly deficient maxilla. Intraoral examination showed that patient was in deciduous dentition stage with mesial step occlusal relation, anterior crossbite with reverse overjet of 3 mm and 30% overbite with no deviation of centric occlusion to centric relation. Maxillary right and left first molars were broken down with arrested caries (Fig 1). The panoramic radiograph showed no missing teeth or pathologies. On analysing Lateral cephalogram patient had class III maxillomandibular relationship (ANB: -2^0). There was horizontal growth tendency with FMA=18^0. Model analysis showed sufficiently wide maxillary arch (Intermolar distance=42mm). After thorough clinical examination, model

and cephalometric analysis it was concluded that the patient is a case of developing class III malocclusion with anterior crossbite and deficient maxilla. Hence, the treatment objective was protraction of maxilla to attain a positive overjet. Keeping in mind the objectives and limiting factors of earlier reported cases, correction with occlusal splint appliance with face mask was planned. Maxillary and mandibular impressions and bite registration was recorded.

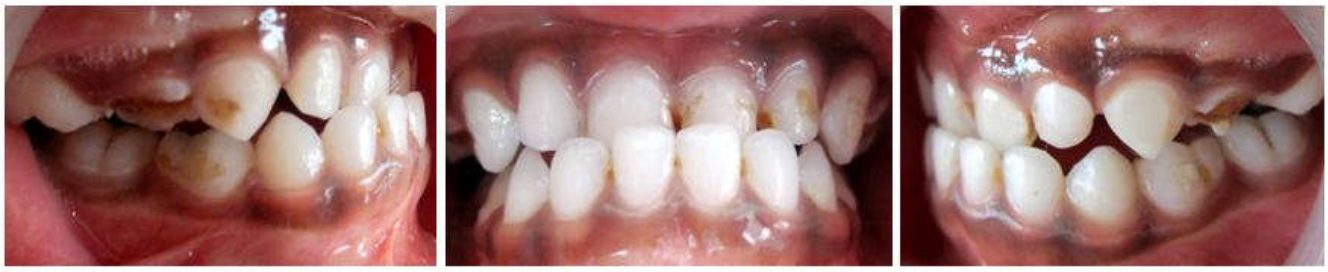

Fig. 1. Pretreatment intraoral photograph

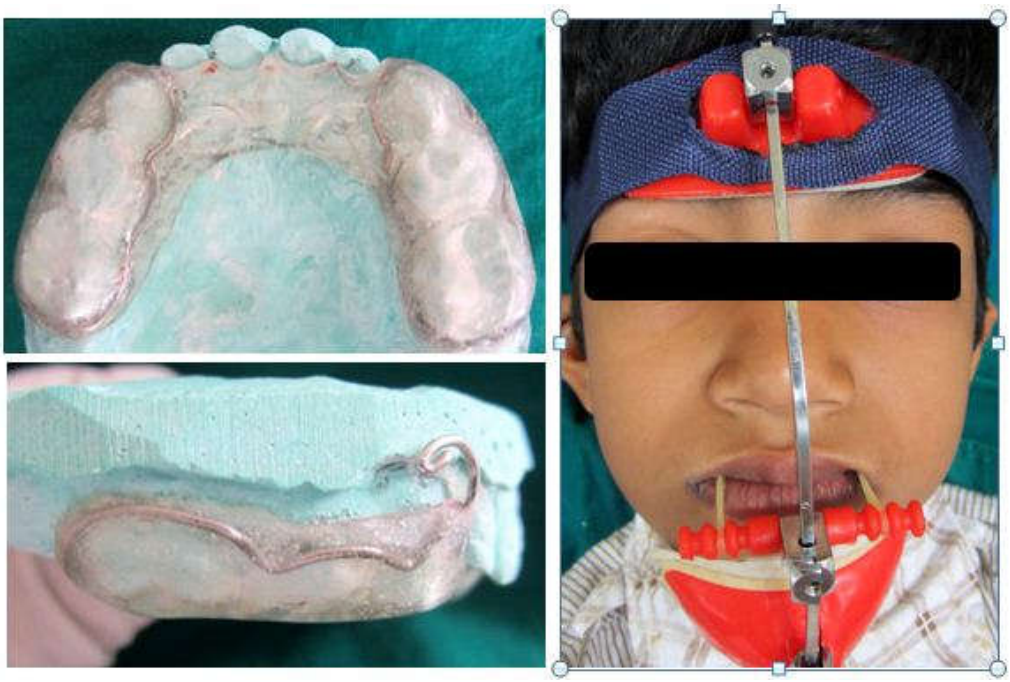

Fig. 2. Appliance Design and Delivery

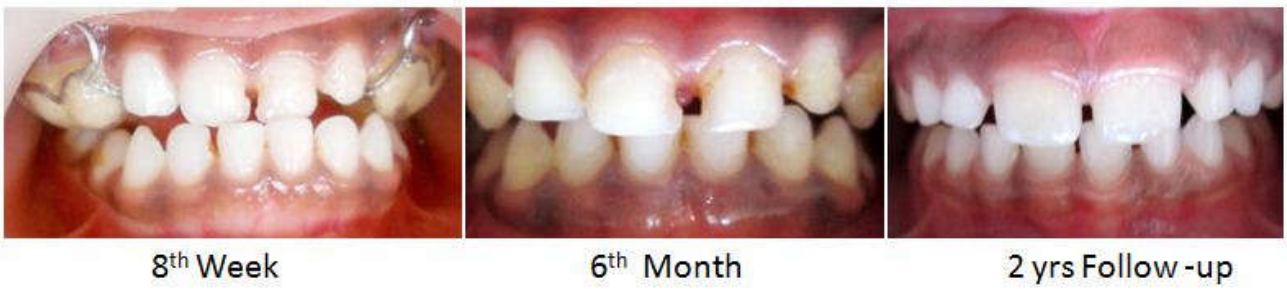

Fig. 3. Intra and Posttreatment Photograph

Maxillary splint component was designed with 0.9mm stainless steel wire extending around maxillary arch from canine to canine and hooks were placed superiorly in canine region as per patient convenience. The acrylic component approximately 2-3mm covering the occlusal aspect from canine to second molar on each side and extending buccally and palatally with 1mm gingival clearance. Occlusal covering aided in disengaging the jaws and protraction. After verifying the fit of appliance, it was polished and cemented using glass ionomer luting cement. Face mask was adjusted aligning with commissure of lips for elastic traction at 15^0 below occlusal plane to minimise counter clockwise rotation tendency. Patient was instructed to wear the face mask initially 6-8hours a day, gradually increasing the duration of wear to 12-14 hours per day in span of 4 weeks to deliver approximately 300-500g/side of force through elastics (Fig 2). Patient was recalled after 24 hours to evaluate the appliance and check the compliance.

Oral hygiene instruction for maintenance was explained. After 8 weeks of appliance wear, edge to edge bite was attained. At the end of 4 month, anterior cross bite was fully corrected with positive overjet of 2mm. After 6 month, cemented appliance was removed. Oral prophylaxis was done and carious teeth (54, 51, 61, and 64) were aesthetically restored using strip crowns. Patient was followed up for 2 years until eruption for maxillary permanent central incisors with no report of relapse.

Patient and parent were satisfied with the outcome of treatment.

DISCUSSION

Early recognition of characteristics predisposing to developing malocclusion in permanent dentition remains the mainstay in interceptive and preventive orthodontics. Fabled behaviour of developing class III malocclusion has remained immutable challenge. This malocclusion encompasses varying intensity of skeletal, functional and dental discrepancies (Paula Vanessa Pedron Oltramari-Navarro, 2013). For long time, mandibular prognathism was considered as major culprit. As mandibular growth is essentially controlled by genetic factors, the choice of treatment was to wait until the growth is complete. Also, according to Guyer et al, 57% of class III patients with either normal or prognathic mandible showed deficiency in the maxilla (Guyer, 1986). Thus, the developing class III malocclusion could be attributed to maxillary skeletal retrusion, mandibular protrusion or combination of both. Additionally maxillary deficiency has now been regarded as important decisive factor in treatment planning and prognosis (Paula Vanessa Pedron Oltramari-Navarro, 2013). Variegated authors recommend that best time for intervention is the ending of primary dentition or early mixed dentition to provide favourable environment for craniofacial growth. Also, unrestricted growth of maxilla guides the mandible to its normal retrusive position (Almeida, 2011).

Raising concerns and continued exploration have led clinicians to intervene at the earliest with one reported case of early management using reverse twin block (Sargod, 2013). Anchorage on deciduous teeth has been advocated instead of newly erupted permanent teeth anticipating external root resorption due to orthopaedic forces, enamel demineralisation and loss of periodontal attachment (Marco Rosa, 2013). This notable case presents earliest intervention in 5year old male patient with class III malocclusion with modified occlusal splint and facemask. Family history ruled out genetic predisposition. Detailed examination and analysis, established the case to be of developing class III malocclusion with retruded maxilla (reverse overjet =3mm, ANB = -2º). Absence of posterior crossbite and intermolar distance of 42mm ruled out need for maxillary expansion. Taking into consideration the difficulties encountered due to complicated appliance design and lacunae of previous reported cases, treatment was focused on correction of class III malocclusion with maxillary protraction using occlusal splint with facemask. McNamara has described use of cemented occlusal splint with rapid maxillary expansion (RME) in young patients (McNamara, 1987). Protocol followed for protraction varies with researchers ranging from 500-2000 gms. (Renato Rodrigues de Almeida, 2015).

The regimen used here is in accordance with the previous reported cases i.e. 300-600gms per side with elastic oriented at 15º below occlusal plane (Kapoor, 2011). Though the recommended duration of wear is 12-14 hrs a day, it was adjusted owing to his young age. So, patient was initially instructed to wear 6-8 hrs/day, gradually increasing to 12-14 hrs/ day over span of 4 weeks. Appreciative patient friendly appliance design in adjunct to patient cooperation resulted in correction within 6 months.

However, patient was followed up for 2 years until eruption of maxillary permanent central incisors. Evidence to date reports of just two case of class III correction in deciduous dentition with reverse twin block and another using RME and facemask (Marco Rosa, 2013 and McNamara, 1987). Therefore the present case report will be valuable addition to the literature with patient and clinician friendly appliance. However, prospective long term evaluation is needed to assess coherence of this appliance.

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