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Case Report

Functional Management of Rare Condition of Congenital Muscular Torticollis Precipitated Malocclusion

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Abstract

Background: alteration in the jaw growth falling within the non-syndromic/normal variation of the facial features may lead to malocclusion of the teeth severe enough to be treated by orthodontics or orthognathic surgery so as to restore normal occlusion. The abnormal cervical muscle function occurring during torticollis may lead to alteration of the head posture affecting the growth and development of the maxilla-facial region leading to occlusal abnormality and facial asymmetry. ***Case report:*** A 14 year old torticollis treated with myofunctional and fixed orthodontic appliance.

Keywords: Torticollis, myofunctional appliance

INTRODUCTION

Asymmetry of the face and dentition is a natural phenomenon with multifactorial etiology [1]. The mechanism of which is not completely understood. Any anatomical alteration in the jaw growth falling within the non-syndromic/normal variation of the facial features may lead to malocclusion of the teeth severe enough to be treated by orthodontics or orthognathic surgery so as to restore normal occlusion [2]. As orthodontists we generally have the perspective of symmetry in our diagnosis and treatment plans, with inter-disciplinary treatment approach we can normalize the stomatognathic function and improvement of the facial esthetics. In daily routine practice, we tend to overlook the frontal facial asymmetry during the initial examination; one such clinical situation is of congenital torticollis. The abnormal cervical muscle function occurring during torticollis may lead to alteration of the head posture affecting the growth and development of the maxilla-facial region leading to occlusal abnormality and facial asymmetry [3, 4].

Diagnosis and Treatment Plan

A 14-year-old boy came to the Department of Orthodontics with the chief complaint of forwardly placed upper teeth and an unpleasant appearance of the face, and wanted treatment for the same. Being the first time when patient presented for the dental treatment. On inquiring patient parents gave history of normal delivery of their child. At the age of 2 years, when the facial deviation became noticeable they consulted their child physician and patient was operated for torticollis on right side of neck. On assessing the patient, his left extremities remained weak, clinical examination revealed deviation of face towards left side (Figure-1). Patient had convex profile with retruded chin and competent lips with no incisor display at rest and 8 mm of incisal display during smile. Patient had an acute nasolabial angle and deep mentolabial sulcus.

Intra oral examination showed presence of all the permanent teeth except 3rd molar, class II molar and end on canine relation were present bilaterally. Buccally erupting 23 and scissor bite with 24, 34 were noted, 1mm of lower midline deviation was noted (Figure 2). Facial asymmetry assessment was done clinically using

bird's eye view and submentovertex view. Visual treatment objective was positive (Figure-3). In Panoramic view (Figure-4) showed all permanent teeth except third molars. Lateral cephalogram (Figure-4, Table-1) confirmed skeletal class II pattern with average growth and cervical vertebral maturation stage III. Grummon's analysis (Figure-4, Table-2) showed the obvious deviation of lower facial third towards left side.

The main objective for Phase I of the treatment were as follows: Correction of facial symmetry through redirection of mandibular growth, achieving class I molar relationship and gain anchorage, attaining functional occlusion with ideal overbite and overjet. This was planned to guide the mandibular growth to minimize the facial asymmetry and improve head posture and esthetics. In phase II treatment, the objective were to relieve upper and lower arch crowding followed by leveling and aligning, achieve Class I canine and incisor relationship while maintaining the class I molar relationship. Long-term retention with upper and lower Begg's retainer was planned along with fixed retainer is planned.

Phase I treatment involved the use of a modified functional appliance (Clark Twin block appliance) directed in the antero-posterior and oblique directions to guide the mandible in the transverse plane to correct facial asymmetry, and to reduce the overjet, achieve Class I molar relationships and gain anchorage at the start of treatment to simplify the fixed appliance stage. Furthermore, there is the theoretical advantage of improving the patient's profile by causing a small skeletal change [5]. This phase was followed with upper and lower fixed appliances (0.022 × 0.028 Slot brackets) to close spaces, detailing and finishing of the case.

A construction bite was recorded keeping in mind to correct the lower facial asymmetry (Figure-5). The guided inclined planes were directed to reposition the mandible in a slightly overcorrected position. Delta clasp was fabricated on 16,26,34,44. In maxillary arch, jackscrew was incorporated in the acrylic base plate so as to achieve expansion in constricted maxillary arch. The recall appointments were scheduled every month for any adjustments needed and selective grinding of the acrylic to redirect the erupting lower posterior teeth for leveling the excessive curve of spee. Selective grinding of the acrylic was performed to allow permanent teeth eruption during phase I treatment. The upper arch was expanded to correct buccal cross bite. After 11 months of phase I treatment, the patient showed an improved facial profile (Figure-6) and bilateral super class I molar (Figure-6). Second phase of treatment was of fixed appliance therapy aimed at achieving good interdigitation.

Treatment Progress

The aim of the functional treatment phase was achieved successfully due to good patient cooperation. This phase of treatment was completed over 11 months, with patient visiting the department monthly. The patient was instructed to practice myofunctional exercises (smile exercises, cheek inflating, cheek stretching and lip stretching) 3 times in a day for a minimum of 3 minutes to achieve facial improvement. The orthodontic appliance was placed from first molar to first molar, using 0.022 x 0.028'' inch pre-adjusted edgewise(PEA) metal brackets; Appliance with MBT versatile^{+} ^{TM} (Ortho-organizer) prescription. The alignment and leveling was started with Ni Ti 0.012 inch (Figure-8). In upper and lower arch, 0.016 AJWilcock base wire with open coil spring placed for space gaining so as to align 32 was placed.012 Ni Ti was used as piggyback with 32 in subsequent phenomena, followed by 0.019 x 0.025 Ni Ti. After this, a 0.019 x 0.025 stainless steel maxillary arch wire was inserted and space closure was performed. After the active phase of the orthodontic treatment is completed, finishing and detailing is preformed with 0.014 AJ Wilcock wire with light yellow class II elastics given. A removable begg's retainer appliance was put into place in the maxillary and mandibular arch a fixed lingual retainer was bonded to mandibular and maxillary anterior teeth.

Treatment Outcome

The treatment objectives were achieved leading to improvement in the profile of the patient after the treatment. The incisor, canine and molar relationships were Class I at the end of the treatment. The overjet and overbite was reduced to the average values. The growth changes are demonstrated in superimposition of the lateral cephalometric and grummons radiographs (Figure-7).

Figure 1: Pre-treatment Extraoral photographs

Frontal with lips at rest

Frontal with smile

Right profile

Figure 2: Pre-treatment Intraoral photographs

Figure-3 Asymmetry assessment

Eagle's eye view

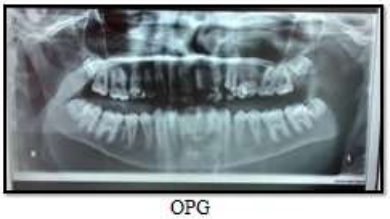
Submentovertex view

V.T.O.

Figure 4: Pre—treatment Radiographs

a)lateral cephalogram

b)Frontal Radiograph



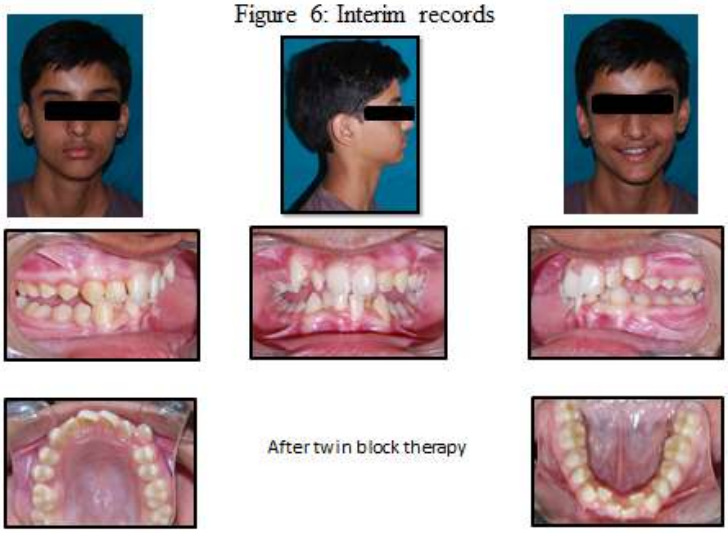
OPG

Figure 5: Interim records

Bite registratiion on working model

Intraoral photographs with appliance in place

Figure 6: Interim records



After twin block therapy

Figure 7: post functional cephalometric superimposition

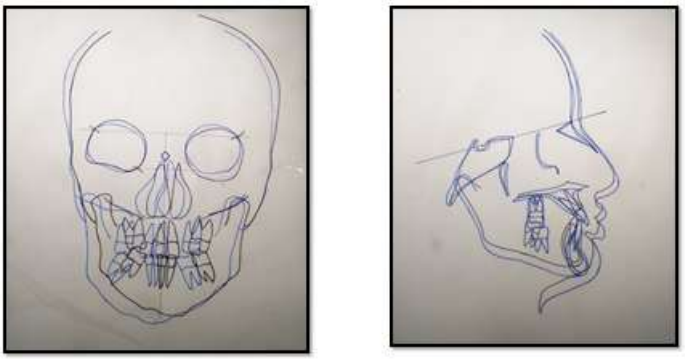
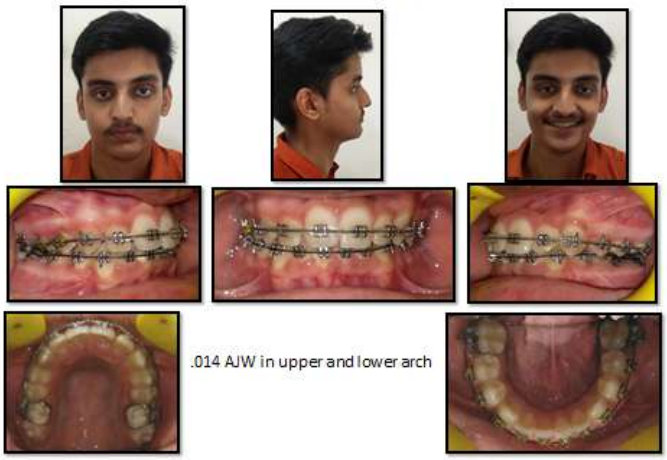


Figure 8: Initiation of fixed orthodontic treatment

Figure 9: Finishing



DISCUSSION

There was an obvious facial asymmetry present in this case, which was due to congenital torticollis, which may produce challenging treatment planning decision orthodontist may encounter [6]. Treatment options to correct these facial asymmetries can range from minor occlusal adjustments to bimaxillary surgery [7, 8].

Dental asymmetry can often be corrected by orthodontics and orthognathic surgery, using symmetric extraction sequences and asymmetric mechanisms. Depending about the growth potential of case, occlusal splint, rapid maxillary expansion, or orthognathic surgery may be indicated. The myofunctional therapy has been stated as a classic form of primary prevention method directed to improve the overall health and well being of an individual. The end result of this therapy is the establishment of the new neuromuscular patterns, correction of functional and resting postures, correction of chewing/ swallowing and eliminates the deleterious habits [9]. Correction of mandibular deviation (facial asymmetry) and temperomandibular joint dysfunction in the patient is possible using modified myofunctional appliances followed by final occlusal settling by fixed appliances. However when patient presents at a growing age, benefits of this growth can be used to guide the mandible to attain an acceptable facial symmetry with the use of functional therapy [10]. *Pirttiniemi et al.* in their studies have found that patients with torticollis who had been operated in early childhood had significantly more lateral cross-bites, also that the extent was correlated with the degree of tilt of the head [11].

Current Case treatment can be supported by parallel case by Melsen *et al.*, who used functional appliance therapy to establish symmetry in functional case, though the factors like timing and patient compliance should also be taken into consideration [12]. Orthodontic camouflage with the help of fixed orthodontic appliance of the dento-alveolar structure was performed for the mild skeletal malocclusion, to stabilize the correction of the skeletal relationships of the jaws achieved by myofunctional appliance by orthodontically repositioning the teeth in the jaw.

Asymmetrical patients have also been found to have a higher incidence of morphological changes and internal derangement in the TMJ on the shifted side when compared to the non-shifted side along with increased risk of disk displacement and TMJ disorder [13, 14]. In the presented case, no symptoms of TMJ disorder were observed either before or after functional appliance therapy. The management with functional appliance in the current case includes dento-alveolar movement with the help of functional orthopedics as the patient is actively growing, allowing compensation to be feasible, anticipating that the further growth occurring will be symmetric.

CONCLUSION

A satisfactory occlusion and a balanced smile were achieved after orthodontic treatment combined with ore-facial myofunctional therapy (Figure-9), suggestive of orofacial myofunctional treatment to be an effective option for a patient with orofacial muscle dysfunction [15]. With this improved function and growth, the patient also experienced marked positive psychological changes at the end of the treatment.

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Declaration of Conflicting Interest: The authors declare that there is no conflict of interest.

Patient Consent

Informed consent of the patient has been obtained. The consent to publish patient information and images was provided by the patient.

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