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Case Report

Comprehensive Management of Midline Deviation Secondary to TMJ Ankylosis in Child- A Case Report

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Abstract

Temporomandibular joint (TMJ) ankylosis or hypo mobility involves fusion of the mandibular condyle to the base of the skull. Restricted mouth opening, difficulty in mastication were the major problems encountered. The treatment of TMJ ankylosis involves a surgical intervention. The surgical approach consisted of Interpositional gap arthroplasty followed by Distraction osteogenesis was done in the patient. This case report describes a case of 7-year-old who treated for post-surgical TMJ midline deviation with an simple innovative appliance.

Keywords: Ankylosis; Distraction Osteogenesis; Inter-Positional Gap Arthroplasty; Temporomandibular Joint

Introduction

Ankylosis of the temporomandibular joint (TMJ) is defined as intracapsular union of the disc-condyle complex to the temporal articular surface that restricts mandibular movements, it includes the fibrous adhesions or bony fusion between condyle, disc, glenoid fossa, and eminence. TMJ ankylosis is a disabling condition that causes problems in mastication, digestion, speech, appearance, and hygiene. Ankylosis can also occur as a result of TMJ surgery [1,2].

Temporomandibular joint ankylosis requires surgery to restore mouth opening. Inability to open the mouth results in an inability to maintain oral hygiene and to chew solid food. This leads to dental caries, malocclusion, weight loss and stunned growth [3].

In this case report the child had a history of TMJ ankylosis. Post-surgical treatment, deviation of mandible to the right side was noted with difficulty in mouth opening. In view of this finding, appliance was designed to correct the midline shift.

Case Report

A 7 year old male patient belonging to Asian race reported to dental OPD with a chief complaint of limited mouth opening since birth and difficulty in eating. For the same problem he visited many hospitals but he didn't receive any treatment. On clinical examination there was limited mouth opening and deviation of mandible on left side was observed. Radiographically it was diagnosed as bilateral ankylosis of TMJ. Patient was referred to oral and maxillofacial surgeon for the surgical management. The patient underwent surgery under general anesthesia to treat and relieve the ankylosis. Interpositional gap arthroplasty followed by which distraction osteogenesis was done (Figure 1). One turn activation was done on daily basis for one and half month. One turn is equal to 1 mm of movement. Following which 1 and half month consolidation period was maintained.

Under general anesthesia, removal of plates used for distraction osteogenesis was done after achievement of advancement in jaw. During the same extraction of root stumps with 73, 74 and 83, 84 was done. Mini screws were placed. The root length was taken into consideration and screw was placed 2 mm above the same with upper right lateral incisor and lower left lateral incisor. Patient was advised to engage elastics for the same on a regular basis to correct the deviation of mandible. Patient discontinued the use of the elastics from the next day because of severe pain and discomfort. The patient was then referred to department of

Pedodontics and preventive dentistry for an alternative treatment option. To overcome the midline deviation following innovativeappliance was designed.

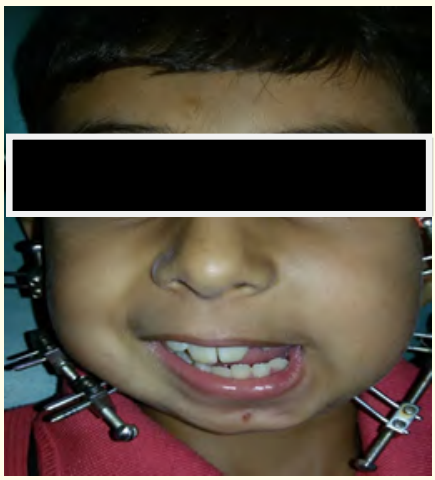

Figure 1: Extraoral photograph of the patient with distraction osteogenesis plates.

Appliance design

Intraoral examination revealed mouth opening of 35.5 mm, midline deviation, constriction of maxillary arch, bilateral posterior crossbites were noted (Figure 2a). Impressions were made with both the arches using Alginate and diagnostic casts were prepared. The initial treatment plan was to correct the midline deviation with the twin block appliance. But in this case no more condylar growth will be evident as condyles were removed Simple innovative appliance was designed with upper jack screw with posterior bite plane and hooks were attached to upper right canine region and lower left canine region. The appliance was cemented with type I GIC and also elastics were incorporated to the hooks (Figure 2b). Patient was advised to use the elastics regularly (Figure 2c) and instructed for the activation of screw by giving quarter turn daily. Patient was recalled for follow up at regular intervals and at one month interval there was good improvement in the midline deviation (Figure 3). Patient gave the feedback that appliance was comfortable. After 2 months follow up there was improvement of midline because of correction of deviation. Normal occlusion was noted on the right side and cross bite on the left side. So the patient was advised to continue use of upper expansion appliance with instructions of quarter turn for every 2 days.

Figure 2a: Pre-operative photograph showing the midline deviation.

Figure 2b: Intraoral photograph with innovative appliance.

Figure 2c: Intraoral photograph after placement of elastics.

Figure 3: Photograph of the patient at 1 month follow up.

After 3 months of follow up due to regular use of the appliance, the midline deviation was corrected (Figure 4) and there was improvement in the mouth opening (45 mm) was seen. Patient was advised to use the appliance for one more month to correct the posterior crossbite on left side and instructed to discontinue the use of elastics.

Figure 4: Photograph of the patient at 3 month follow up.

Discussion

The clinical findings of TMJ ankylosis in children are affected by the age of onset, the duration, and whether the ankylosis is unilateral or bilateral. Unilateral ankylosis reveals unilateral hypoplasia of the mandible and deviation of the chin to the affected side.

Severe retrognathia, mandibular alveolar protrusion, open-bite deformity, bird-face appearance, and hypertrophic and thick coronoid process in bilateral ankylosis. Night snoring and obstructive sleep apnea are the other clinical findings in bilateral ankylosis [4].

Mandibular asymmetry or bird-face deformities will be the outcome according to whether the case is unilateral or bilateral. The long standing ankylosed joints result in chronic isometric contractions of the masticatory muscles. This gives rise to shortening of the mandibular ramus/rami (pterygomasseteric muscle sling) recession of the chin and its elongation in a cephalocaudal direct development of the antegonial notch owing to the antagonistic actions of the pterygomasseteric sling and the depressor muscles [5]. Temporomandibular joint ankylosis protocols throughout the world suggest early surgical intervention, elaborate resection, early mobilization, and aggressive physiotherapy for at least 6 months postoperatively.

Narmada., *et al*. had listed the various methods of correction of functional midline deviation which are unlocking the mandible, removal of occlusal prematurities, expansion of upper arch, functional appliances, interarch elastics [6]. Bob., *et al*. demonstrated the use of twin block appliance with significant good results in correction of deviation following ankylosis [7].

In this case upper arch expansion was incorporated with jack screw and hook in the upper right canine region and lower left canine region. This was done as the child is in growing stage. However mandibular growth may not be evident as the condyle is removed. After 2 months' time, there was significant change noted in the midline deviation. Crossbite was noted in the posterior region on the left side. Hence patient was asked to continue expansion.

The advantages of this appliance is that it is removable, easy to fabricate, less chair side time required. Patient compliance is very important for the success rate of the treatment. Disadvantages being maintaining the oral hygiene.

Conclusion

Any pathology that affects the T.M.J and restricts mouth opening always carry a mental stigma. Ankylosis of TMJ hinders the integrity of craniofacial skeleton, also affects the normal, growth development of occlusion and jaws. Timely management may reduce the adverse effects associated with the deviation due to ankylosis. In order to achieve successful and stable results correction of midline deviations requires an attentive diagnosis, a well thought out treatment plan, and case-specific selection of suitable mechanics. However, long-term evaluation of the stability of results that are obtained at the end of the treatment is required.

Source(s) of Support

Nil.

Conflicting Interest

Nil.

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