

TMJ ankylosis and secondary deformities: An orthodontics approach

Imran Pathan

PG Student, Department of Orthodontics, Albadar Dental College and Hospital, Gulbarga, Karnataka, INDIA.

Email: imran352@gmail.com

Abstract

Treatment of patients with TMJ ankylosis and secondary deformities is a challenging problem. Although various techniques, including arthroplasties, orthognathic surgery, autogenous bone graft, have been described for the management of patients with this condition, an appropriate treatment protocol has not been established. The purpose of this paper is to describe a 2-stage treatment protocol, comprising TMJ reconstruction as the initial surgery, and correction of secondary deformities as the second surgery followed by orthodontic correction for facial asymmetry for the management of TMJ ankylosis with secondary deformities. Several studies in the past, have shown that the 2-stage treatment protocol described not only restores oral function but also improves the patient's esthetic appearance and Satisfactory occlusion was achieved with the help of orthodontic treatment. Hence, we believe that it is a good approach for management of TMJ ankylosis with secondary deformities and facial asymmetry in patients with TMJ ankylosis. In this paper, six cases who visited our institution with TMJ ankylosis and secondary deformities underwent TMJ reconstruction as the initial surgery, followed by correction of secondary deformities as the second surgery later essential orthodontic correction is to be evaluated. Clinical outcome assessed based on oral function, radiography, and photography.

Key Words: TMJ ankylosis.

*Address for Correspondence:

Dr.Imran Nizam Pathan, Pension Pura, Hospital Road Ambajogai, Beed, Maharashtra-431517

Email: imran352@gmail.com

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INTRODUCTION

Ankylosis of temporomandibular joint (TMJ) is an intracapsular union of the disc-condyle complex to temporal articular surface that restricts mandibular movement, including the fibrous adhesions or bony fusion between condyle, disc, glenoid fossa, and articular eminence. TMJ ankylosis is more commonly associated with trauma (13–100%), local or systemic infection (10–49%), or systemic diseases (100%), such as ankylosing spondylitis, rheumatoid arthritis, and psoriasis. However, it can also occur congenitally or secondary to severe

rheumatoid arthritis or to tumors in the area of TMJ. Ankylosis can also occur as a result of TMJ surgery. It is a serious and disabling condition that may cause problem in facial growth, mastication, swallowing, digestion, speech, appearance, and poor oral hygiene with rampant caries. Facial asymmetry develops if TMJ is affected unilaterally or bilaterally. Disturbances of facial and mandibular growth and acute compromise of the airway invariably result in physical and psychological disability. Severity of ankylosis is diagnosed by evaluating the degree to which mouth opening is restricted. Various radiographic investigations determine the abnormality in the bony or soft tissue formations in the joint. The treatment of TMJ ankylosis poses a significant challenge because of technical difficulties and high incidence of recurrence. Team approach is required for resolving functional, esthetic (cosmetic), psychological (emotional), or social problems associated with ankyloses. Case series of 6 patients has been discussed in this paper where orthodontic approach was used to correct facial asymmetry.

Treatment Progress

1. **The initial surgery:** Was accomplished under general anesthesia. Gap arthroplasty was performed through the preauricular approach. After exposure and identification of the site of the ankylosis, aggressive excision of the fibrous and/or bony mass was carried out with round bur and chisel until the mandibular movement was achieved. Next the glenoid fossa was recontoured as necessary (as per gap opening). For total TMJ reconstruction, after resection a costochondral graft was put in place in order to reconstruct the TMJ. Temporalis myofascial graft was interpositioned successfully.
2. **Physiotherapy:** After surgery, extensive physiotherapy usually plays a crucial role in restoring normal TMJ function. Masticatory muscles, lips, and tongue exercises were proposed to increase mobility of mandible. To stimulate normal mastication, chewing on a small rubber tube was recommended. For aggressive physiotherapy tongue blade were used. Results were promising, and 4 cm range of mouth opening was achieved and satisfactorily maintained after surgery.
3. **Restorative and oral prophylactic care:** Once the goal of mouth opening to its maximum by the patient was achieved, all carious teeth were restored and patients were trained and learned to take care of daily prophylactic oral hygiene measures.
4. **Genioplasty:** 6 months after completion of orthodontic treatment, sliding advancement genioplasty was performed. Chin advanced 8 mm, and fixation was performed with titanium plate.
5. **Speech and functional therapy:** Concerns regarding speech were thought to be equally significant with appearance in contributing to low self-esteem in these patients. Unusual speech due to jaw thrusting was the problem faced by the patient. Patients were thoroughly evaluated for the speech therapy. Problem observed in patient was mixed type of articulation disorder included omission, substitution, and distortion types. Patients were prepared for the speech therapy right from initial visit in institution, and major training was started after possible sufficient jaw movements after TMJ surgery. Articulation defects were well improved after joint surgery and orthodontic dentoalveolar corrections. Lispering of sound was eliminated completely after orthodontic corrections.
6. **Psychological counseling:** Psychometric tests can identify the adversity in the experience of TMJ ankylosis having facial poor appearance. It was attempted to evaluate the thoughts and feeling of a disfigurement in face in pretreatment and post treatment stages using standardized psychometric questionnaires that have been developed, validated, and used by social scientist and psychologist.
7. **Fixed orthodontic mechanotherapy:** was initiated for aligning and establishment of occlusion using fixed bonded orthodontic appliance. After completion of alignment and leveling in 2 and half months, premolars were extracted as required and space closure was done with maximum conservation of posterior anchorage. After 14 months of treatment, the patient showed a good class-I dental relationship, with the upper and lower anterior teeth retracted and up righted into near-normal positions over the basal bone. Space closure was completed without the development of an anterior open bite or deep overbite. With the retraction of the lips, the patient's profile and smile improved. After debonding of fixed appliance, upper wraparound and lower Hawley's removable retainers were delivered.

RESULTS

Profile of patient was improved from retrognathic to orthognathic, and mouth opening was increased up to 4 cm. The patient showed favorable results not only in terms of esthetics and function but also profoundly positive influence on the psychological development, self-esteem, and self-confidence. Parents and the patient agree on the satisfaction with clarity and fluency of speech.





DISCUSSION

Cases were considered to represent adolescents who present unique psychosocial adjustment concerns with craniofacial anomaly. TMJ ankylosis impacts facial and head features differently, resulting in differences in both appearances and speech. Management of the psychosocial adjustment of patient with poor facial appearances has moved from development of adaptation towards the optimum results deserved by the patient from the possible team approach. In the cases presented here, there were significant improvements obtained by employing treatment through phase wise multidisciplinary approach. These patient reports demonstrate that the well-planned stage wise treatment by various specialists serves the best possible approach ever deserved by the patient to get over the impact of disfigurement, impaired functions and psychosocial stigma. Specialists involved in team care were orthodontist, oral and maxillofacial surgeon, physiotherapist, speech therapist, psychiatrist, endodontist, and periodontist. Biggest advantage of multidisciplinary team care was achieving the goal of functional efficiency, structural stability, esthetic harmony, and psychosocial competency.

CONCLUSION

Multidisciplinary approach by team work for treatment of TMJ ankylosis serves towards a better outcome in order to capture the richness of experience in the lives of patient and boosting the level of confidence along with normal form, function, and stability. Orthodontic treatment plays a important role in restoring the facial profile, occlusal cant, dental axis and chin deviation in patients with TMJ ankylosis and secondary deformities.

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