Orthodontic Mini-implants for Treatment of Long-term Anterior Dislocation of Temporomandibular Joint

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ABSTRACT

Acute dislocation of the temporomandibular joint (TMJ) is a relatively common occurrence; chronic long-term dislocation is rare. Variance in the duration of dislocation and anatomical considerations make the treatment for long-standing dislocation complex and controversial. This case report describes a new method of conservative management of a long-standing TMJ dislocation using orthodontic mini-implants.

Keywords: Temporomandibular, Dislocation, Orthodontic mini-implants.

INTRODUCTION

Dislocation of the mandibular condyle is characterized by unilateral or bilateral locking of the condyle anterior to the articular eminence and can cause functional impairment, facial deformity and pain. The overall incidence is reported to be between 3 and 7% in the general population. The etiology of mandibular dislocation includes the following factors: (1) intrinsic or extrinsic trauma with rupture, tearing, or stretching of the temporomandibular joint (TMJ) ligaments and capsule, with or without disk injury; (2) hyperfunction of protractor muscles, (3) degeneration of TMJ ligaments and capsule secondary to disease (i.e. rheumatoid arthritis, psoriatic arthritis), (4) neuromuscular dysfunction (i.e. epilepsy, Parkinson’s disease, stroke), (5) familial joint laxity (i.e. Ehlers-Danlos syndrome); (6) drug-induced reaction causing extrapyramidal reactions and (7) psychogenic disorders.

Indications for treatment of chronic recurrent mandibular dislocation include pain; masticatory dysfunction; repetitive episodes of dislocation; facial deformity; and TMJ, jaw and occlusal dysfunction. The goals of treatment are to restrict mandibular translation or remove obstacles, thus preventing mandibular dislocation and locking anterior to the articular eminence.

Nonsurgical methods of treatment include the following: (1) medications, (2) psychological management, (3) physical therapy, (4) intermaxillary fixation, and (5) injection of sclerosing agents into the TMJ capsule, TMJ ligament, and bilaminar tissue (with or without using arthroscopy).

Surgical options can be divided into the five categories as follows: (1) soft tissue procedures, (2) removal of obstruction, (3) creation of translatory obstruction, (4) tethering and (5) mandibular osteotomies. The objective of this article was to present a new technology for tethering the condyle with orthodontic mini-implants for non-surgical correction of chronic recurrent dislocation of the mandibular condyle.

CASE REPORT

A 19-year-old female was referred to the Department of Oral and Maxillofacial surgery in Post Graduate Institute of Dental Sciences (PGIDS), Rohtak, with the chief complaint of inability to close her mouth and associated pain in front of both sides of the ears. Fifteen days prior to presentation to the department, she consulted an outside hospital after an epileptic attack and was misdiagnosed to have some local lesion. The doctor was unable to reduce the dislocation discharged her along with some medications and the assurance of getting it self corrected. After 15 days, when she was not relieved of pain, she came to the department of oral and maxillofacial surgery. Patient had a history of epileptic attack, and she was taking medicines (phenothiazine group) for the same. On clinical examination, she had a deviation of the mouth to the left side, mandibular dental midline...
was deviated by 4 mm to the left side, mouth opening was just 7 mm. She was diagnosed with chronic anterior dislocation of the TMJ on account of anterior dislocation of the right condylar head. The pretreatment extraoral, intraoral photographs are shown in Figures 1A to E, and pretreatment orthopantomogram in Figure 2.

After diagnosis of the dislocation, the anxiety reduction protocol was followed to make the patient calm. Then attempts to reduce the TMJ dislocation were made using the ‘Hippocrate method’\(^5\), i.e. pressing jaw the jaw downward and backward placing the thumb on the last molar of both sides. But, there was a failure of attempts to reduce the dislocation. Thereafter, the patient was given an auriculotemporal nerve block using 2% Xylocaine (1:80,000 adrenaline). But, again unsuccessful attempts were made to reduce the joint. Thereafter, it was decided to reduce the joint with the help of a surgical procedure called ‘Flink technique’,\(^6\) but the patient refused to undergo a surgical intervention. Then the patient was considered for a conservative approach, i.e. reduction of the TMJ using a unilateral Class III elastic traction with the help of the orthodontic mini-implants. Unilaterally, one titanium screw (diameter 1.5 mm and length 8 mm) was inserted in right mandibular canine-first premolar region and other in right maxillary second premolar-first molar region. Then 3/16” diameter heavy elastic with traction force of 180 gm in Class III vector was applied between the two mini-implants.

Patient was asked to change the elastic every 24 hours and report next day. On clinical examination after 24 hours, there was perfect occlusion bilaterally, dental midlines were matching, increased mouth opening of 26 mm was noted depicting the reduction of the right condylar head. The post-treatment extraoral, intraoral photographs are shown along with mini-implant in position with the elastic (Figs 3A to E).

The right condylar head was seated in the articular fossa after the treatment as shown in the post-treatment orthopantomogram (Fig. 4). The results were stable after 1 month follow-up with a mouth opening of 30 mm (Figs 5A to E).
DISCUSSION

Patients with epilepsy are significantly more susceptible to facial and dental injuries. This has been reported by several other authors, including Martin, who stated that medical conditions, such as uncontrolled attacks can put patients at risk of suffering orofacial trauma. Dislocation of TMJ is one of the rarest types of joint dislocation accounting for approximately 3% of all joint dislocations. Sign and symptom of dislocation include inability to close the mouth, depression of preauricular skin, excessive salivation and tense spastic muscles of mastication with severe TMJ pain. There are various causes of TMJ dislocation: epileptic fits and drug-induced reaction, causing extra-pyramidal reactions. Epileptic fit is one of them which caused the anterior dislocation in our case. A preoperative magnetic resonance imaging examination is usually helpful in determining the position and condition of the disk.

Long-standing dislocation of the TMJ dislocation usually occurs when a case of acute dislocation is left untreated or is inadequately treated. Overtime the anterior positioning of the condyle results in soft tissue becoming fibrosed, and causes muscle spasms. The more time that has elapsed from the dislocation increases the severity of these changes and results in increased difficulty and more complex procedures needed to reduce the joint. Huang et al presented six cases of long-standing TMJ dislocation, in their series, they found that dislocations lasting for more than 30 days could not be treated by conventional manipulation. In literature, there are no precise guidelines or protocols for reduction of TMJ that can suggest which method should be advocated and when. Though, there are two treatment modalities—surgical and conservative.

In this case, a conservative method was attempted to reduce the dislocation, and a surgical intervention was avoided, because the patient had not given the consent for surgical method. Since dislocation was chronic; about 15 days old, we managed the case conservatively with a Class III vector force of 180 gm on right side only.
CONCLUSION

The use of two orthodontic mini-implants and heavy elastic force provides a method for controlled mandibular translation, at the same time, effectively preventing mandibular dislocation. The technique also has the advantage of controlling condylar dislocation without altering natural joint anatomy in that the superior and inferior joint spaces are not surgically violated unless simultaneous disk repositioning is indicated.

REFERENCES