Surgical Correction of TMJ Bilateral Dislocation with Eminectomy and Capsulorrhaphy as an Adjuvant: Case Reports

Suresh Vyloppilli¹ · Benny Joseph² · K. P. Manojkumar² · Shermil Sayd³ · K. S. Krishnakumar⁴

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Abstract

Introduction Anterior excessive movement of the temporomandibular joint (TMJ) is a condition which reduces the quality of life of a person to great extent with the patient always living in the fear of inherent dislocation. Dislocation of the temporomandibular joint represents 3% of all reported joint dislocations.

Case report In this article, we discuss about two cases where the patients with chronic TMJ dislocation were treated with eminectomy and capsulorrhaphy. Both the patients were reviewed over a period of 1 year and did not show any recurrence of the condition with satisfactory controlled increase in mouth opening.

Conclusion The combination has proved to be useful for the better neuromuscular control and psychological aspect, i.e., the fear of dislocation. Future of the technique combination lies in further prospective studies.

Keywords TMJ dislocation · Chronic recurrent dislocation · Eminectomy · Capsulorrhaphy

Introduction

Individuals having excessive anterior movement of the mandibular condyle, passing the articular eminence during maximal opening, causes them discomfort. The terms “subluxation” and “dislocation” were used to describe this phenomenon. In cases where repeated dislocations occur, the term “chronic,” “chronic recurrent” or “habitual” could be used. [1, 2] A dislocation of the temporomandibular joint represents 3% of all reported joint dislocations [3].

Temporomandibular joint dislocation is defined as an excessive forward movement of the condyle beyond the articular eminence with complete separation of the articular surfaces and fixation in that position [4, 5]. It is commonly associated with poor development of articular fossa, laxity of temporomandibular ligaments or joint capsule, excessive activity of the lateral pterygoid and infrahyoid muscles due to drug usage or disease [4–6] and to a lesser extent trauma [3]. Precipitating factors are yawning, vomiting, laughing and dental and otolaryngological treatments [1]. Various therapeutic approaches designed to limit the forward excursion in the literature had been applied. This paper reports 2 cases of chronic recurrent dislocation treated using both restricting and relieving procedure, i.e., eminectomy with capsulorrhaphy simultaneously.

Case Report

Both the cases were female patients of age 23–25 years who had attended the emergency department, unable to close their mouth after yawning. Both the patients gave a

✉ Shermil Sayd
shermil12@gmail.com

¹ Department of Oral and Maxillofacial Surgery and Dentistry, Malankara Orthodox Syrian Church Medical College Hospital, Kolenchery, Ernakulum, Kerala, India

² Department of Oral and Maxillofacial Surgery, KMCT Dental College and Hospitals, Manassery, Calicut, Kerala, India

³ Department of Oral and Maxillofacial Surgery, Kannur Dental College, Anjarakandy, Kannur, Kerala, India

⁴ ASTER MIMS Hospital, Calicut, Kerala, India

Fig. 1 Pre-operative photograph

Fig. 2 Pre-operative orthopantomograph

history of long-standing clicking and later recurrent episodes of dislocation, which were treated elsewhere. Both the dislocations (bilateral) were reduced under local anesthesia and muscle relaxants. Patients were kept on restricted mouth opening with orthopedic chin cups. Both patients had recurrence within 2 months, and reduction was done with high index of difficulty and patient discomfort. Due to patient concern, failure in conservative management, and remote living areas with inaccessibility to emergency treatment, open surgical treatment was planned. The patients were taken up for surgery under general anesthesia (Fig. 1). Although thorough higher TMJ investigative modalities were advised, monetary reasons and inaccessibility of the patients to these modalities lead to compromised treatment protocol with orthopantomograph as the only available imaging (Fig. 2). Because of the severity and recurrence of the dislocation, further attempts were not made to make precise measurements of mouth opening. A rough estimation was done, and both patients showed approximately one finger width opening.

Fig. 3 Incision

Fig. 4 Exposure of the temporalis fascia

Surgical Technique

A “Popwich” incision was used to approach the zygomatic arch and the articular eminence. The skin incision begins about a pinna length away from the ear, anteroposteriorly just within the hairline, curves backward and downward well posterior to the main branches of the temporal vessels, till it meets the upper attachment of the ear. The rest of the incision is same as the routine preauricular incision (Fig. 3). The temporal incision is carried through the skin, superficial fascia to the level of temporal fascia (Fig. 4). The facial nerve branches run in the superficial fascia, and it is important that the full length of fascia is reflected with skin flap. Blunt dissection in this plane is carried out till about two centimeters above the zygomatic arches where the temporalis fascia splits. Starting at the root of

Fig. 5 Exposure of the surgical site

Fig. 6 Placement of bur holes for eminectomy

zygomatic arch, an incision running at 45° upward and forward is made through the superficial layer of temporal fascia. The zygomatic arch is exposed after reflecting periosteum, lateral of temporal fascia and superficial fascia as one layer. Downward and anterior dissection will expose the capsule and articular eminence (Fig. 5). The full mediolateral width of the eminence and capsule was exposed. The full mediolateral and anteroposterior dimension of the eminence was removed together with smoothing of all peripheral bony irregularities with bur, taking care not to injure the maxillary artery (Figs. 6, 7). After removing a wedge in the capsule, capsulorrhaphy was done with 3-0 PDS (polydioxanone) mattress suture (Fig. 7). Closure was done in layers 4-0 PDS and 5-0 ethilon. Pressure dressing was given for 24 h. Routine systemic antibiotics were given for 5–7 days. Patients were advised soft diet for 2 weeks.

Fig. 7 Eminectomy done and capsulorrhaphy done (arrow indicates the sutures placed)

Fig. 8 Post-operative mouth opening

Fig. 9 Post-operative orthopantomograph

Patients were reviewed after 2 weeks, and they exhibited stress-free attitude with increased confidence and adequate mouth opening (Fig. 8). Orthopantomograph was taken to confirm the location of the structures (Fig. 9).

Discussion

Dislocation of the condyle is a rather common situation that is often seen in emergency rooms, where patient present with difficulty or impossibility of closing the mouth, usually after yawning, laughing or vomiting. The condition may also occur after excessive mouth opening during dental treatment or other medical procedures while the patient is under general anesthesia [7]. In most of the cases, dislocation is an isolated episode, but in others, there is a history of recurrent dislocation unilateral or bilateral [5, 8, 9].

Condylar dislocation may occur as a combination of 3 factors such as laxity of the capsular and mandibular ligaments, large bony eminence and muscle spasm. The laxity of the ligaments will permit the condyle to go far anterior during mandibular opening, passing the articular eminence. Some patients will have an inferiorly extended articular eminence, which will function as a mechanical barrier. Once the condyle trespasses the eminence, muscle spasm between protractor muscles, which will continue to push the condyle forward while the elevator muscles try to push the mandible back, will keep the condyle anterior to the eminence, thus creating the open–lock condition [7].

Anthropological research has revealed that primitive races had a shallow glenoid and a low tubercle, enabling the joint make extensive excursions. In the highly civilized races, the habit of mastication today produces a typical deep, contracted fossa and a high and narrow tubercle. In this type of joints, habitual dislocation is seen [8].

In order to treat these patients, various methods, conservative and surgical, are described in the literature. The conservative treatment includes physiotherapy, intermaxillary fixation, injection with sclerosing solution and autologous blood transfusion. Except for autologous blood transfusion by Schulz et al. [10], all others showed a great deal of recurrences. Since its discovery in 1897 to its introduction as a therapeutic agent in 1977 to present day, botulinum toxin has evolved from a poison to a versatile clinical tool with as expanding list of uses including the treatment of chronic recurrent dislocation [11].

In the cases where the non-surgical methods fail, the surgical techniques should be thought of. The vast number of surgical techniques tried over years illustrates the difficulty that has been experienced in producing a satisfactory method for the treatment of chronic recurrent dislocation. Surgical techniques used were partial or complete myotomy [12], capsular plication [13], scarification of temporalis tendon [14], open condylotomy [15], inversion of implants into the articular eminence [16, 17], down-fracturing of the zygomatic arches [18]

augmentation of the eminence by allografts [19] and eminectomy [20–22]. Of the myriad procedures currently employed by surgeons, eminectomy and augmentation of the articular eminence by bone graft are in all probability, the most popular [1]. In both our cases of chronic recurrent dislocation (CRD), patient had recurrent episodes even after the conservative treatment. Patients were living with inherent fear and were not willing to open. Combination of eminectomy and capsulorrhaphy was planned and executed since the initial decreased mouth opening due to capsulorrhaphy had a positive effect on the psychological aspect of the patients and had helped to increase the confidence. The gradual increase in the mouth opening also helped to have a controlled stretch of muscle and ligaments, with a better neuromuscular control. Both the patients were followed up for a period of 1 year showed satisfactory mouth opening with no recurrence of CRD. Even though there was a significant reduction in mouth opening during immediate postoperative period, the combination of eminectomy with capsulorrhaphy as an adjunct provided satisfactory controlled mouth opening and a better standard of life for the patients since the goal of treatment is not to increase the range of mandibular motion alone but provide satisfactory mouth opening without the fear of further CRD. Eminectomy, first described by Hilmar Myhraug [20], is indicated in cases with CRD. The logic behind the eminectomy is to remove the obstacle to the backward gliding of the locked condyle. Care should be taken to remove the full mediolateral and anteroposterior dimension. It is a procedure of a biological basis and provides long-standing positive results except for the mouth opening which would further increase the stretch of muscles and check ligaments. Capsulorrhaphy is a restrictive procedure, but will not give a long-standing result since there is gradual stretch of the plicated capsule.

Conclusion

The surgical treatment of chronic recurrent dislocation of the TMJ has reflected a variety of experiences with different techniques and whether to confine or to provide free movement of the condylar head is still a debatable matter. The combination of eminectomy with capsulorrhaphy as an adjunct, in our cases, has proved to be useful for the better neuromuscular control and psychological aspect, i.e., the inherent fear of dislocation. Since the concept of to confine or to relieve is still debatable, the combination techniques mentioned need well-controlled novel prospective research.

Compliance with Ethical Standards

Conflict of interest Dr. Suresh Vyloppilli declares that he has no conflict of interest. Dr. Benny Joseph declares that he has no conflict of interest. Dr. K P Manojkumar declares that he has no conflict of interest. Dr. Shermil Sayd declares that he has no conflict of interest. Dr. K S Krishnakumar declares that he has no conflict of interest.

Ethical Approval All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

Informed Consent Informed consent was obtained from all individual participants included in the study.

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