Surgical Management of Chronic Temporomandibular Joint Dislocations

Abstract

Introduction: Temporomandibular joint dislocation is described as the movement of mandibular condyle out of the fossa beyond its anatomical and functional boundaries causing pain and discomfort. It is often managed by conservative methods, but in long-standing, chronic conditions, surgical treatment is the only option. The goal of surgical treatment is to reposition the condyle and prevent further recurrences. Materials and Methods: This retrospective analysis involving a single center and a surgeon with 19 patients and 23 joint surgeries performed over a 10-year period. Patients who fulfilled inclusion and exclusion criteria and had earlier undergone surgical correction with hook-shaped miniplates and miniscrews fixed with or without bone grafts formed the study group. Results: In all, 12 were female (mean age, 41.9 ± 12.07 years) and the rest 9 were male (mean age, 39.8 ± 13.6 years), ranging from 32 years to 58 years. All patients had the dislocation for an average period of 19.26 ± 12.6 months before the surgery. The mean maximal mouth opening (without pain) preoperatively was 17.78 ± 2.13 mm (12–25 mm) while postoperatively it was 32.28 ± 3.17 mm (27–37 mm). There were no immediate or late surgical complications in the follow-up period that ranged from 8 to 37 months. Discussion: When proper case selection is employed and properly done, using hook-shaped miniplates with or without bone graft is more cost-effective, giving excellent short- and long-term effects. Conclusion: The results in this Indian population are very similar to that reported from other parts of the world.

Keywords: Hook-shaped miniplates, India, joint dislocation, pseudarthrosis of temporomandibular joint, temporomandibular joint dislocation, temporomandibular joint pain

Introduction

The temporomandibular joint (TMJ), the only visible movable joint in the cranium, is a joint involving the parts of the temporal bone and the condyle of the mandible. It is best described as a “ginglymoarthrodial” joint as it is both a ginglymus (hinging joint) and an arthrodial (sliding) joint. The basic range of movements of a normal TMJ includes protrusion (sliding of the condyle in the forward direction), retraction (sliding of the condyle to its original position), elevation (closing of the jaw), depression (opening of the jaw), and lateralization.[1]

TMJ dislocation is a common pathology of the joint where the mandibular condyle moves out of the glenoid fossa. In extreme cases, the posterior articulating surface of the condyle advances in front of the articular eminence of TMJ. This pathology reportedly occurs at least once in up to 7% of the general population during their lifetime and accounts for 3% of all articular body luxations.[2,3] The disorder is commonly associated with trauma, most common in the 3rd to 4th decades of life, with debatable gender predilection.[2,4]

The pathogenesis of TMJ dislocation is reported to be multifactorial. It occurs frequently as a result of the following one or more situations: abnormal structural components (such as laxity in capsular tissue, weak ligaments, deep eminence, abnormal condylar shape, and atypical disc position); systemic diseases (such as involving abnormal collagen – Marfan’s syndrome and Ehlers–Danlos syndrome); neurodegenerative/neurodysfunctional diseases (such as Huntington’s disease, epilepsy, Parkinson’s disease, and multiple sclerosis); muscle dystrophies/dystonias; use of drugs such as phenothiazines or metoclopramide; iatrogenic damage during procedures such as intubation/laryngoscopy; dental, ear, nose, and throat procedures; gastrointestinal endoscopies; and/or trauma.[2,3]

The management ranges from conservative to surgical approach depending on cause,
etiology, precipitating and predisposing factors, age, and the extent of abnormalities and has been reviewed in depth earlier. There is a paucity of reports of successful management of such chronic TMJ dislocation in this part of the world. This paper intends to present a single-center experience of surgical management of such chronic TMJ dislocation [Figure 1].

**Materials and Methods**

A retrospective analysis of 19 patients and 23 joints that were not amenable to conservative management and treated with hook-shaped miniplates with miniscrews between June 2007 and June 2016 formed the subjects of the present study. As this is a retrospective study involving only depersonalized data, clearance from the institutional review board was not necessary.

From case records, all relevant details were collected. Of the total 19 patients, 12 were female (mean age, 41.9 ± 12.07 years) and the rest 9 were male (mean age, 39.8 ± 13.6 years), ranging from 32 years to 58 years. All patients had the dislocation for an average period of 19.26 ± 12.6 months before the surgery. Conservative and minimal interventions for dislocation failed and surgical treatment was employed as the last option. After ruling out/addressing all possible, known relevant etiological factors, radiological examination was performed [Figure 2]. Criteria for surgery were extreme limitation of jaw movements or regional pain while eating, prominent dislocation (clinically and/or radiologically), and multiple episodes of TMJ dislocation, hindering normal day-to-day activities. Cases where pseudojoint formation had occurred were excluded as pathoses were significantly different. All cases were operated at the author’s center by the author himself.

Surgery was performed under general anesthesia with a preauricular approach using the procedure of Ellis and Zide [Figure 3a]. A miniplate was modified appropriately to be shaped like a hook, and if required, additional autologous bone graft (iliac or calvarial bone) was adapted and fixed in the glenoid fossa, placed, and fixed into the concave site of the hook-shaped miniplate with miniscrews. The articular eminence periosteum was elevated with a bone dissector [Figure 3b]. The miniplate was fixed at the anteroinferior region of the articular eminence at an appropriate place such that the hook would hinder abnormal motion, but would not hinder normal functioning of the TMJ [Figure 3c]. This was checked by forced opening of the mouth, wherein the condyle was unable to advance beyond the articular eminence. After checking, the incisions were closed in layers [Figure 3d]. Appropriate rest

![Figure 1: Mandibular deviation to the right side in a patient with left-sided temporomandibular joint dislocation](image1)

![Figure 2: Computed tomography scan images of temporomandibular joint dislocation. (a) Mouth closed. (b) Mouth open](image2)
and antibiotic and nonsteroidal anti-inflammatory coverage were provided. Performing substantial postoperative physiotherapy was advised in all cases to prevent any possible arthrosis or pseudankylosis and was initiated as early as the 7th postoperative day.

Results

The duration of the postoperative follow-up period was 8–37 months. The mean maximal mouth opening (without pain) preoperatively was 17.78 ± 2.13 mm (12–25 mm) while postoperatively it was 32.28 ± 3.17 mm (27 to 37 mm). There were no immediate or late surgical complications. Few of the patients who had pain while performing postoperative physiotherapy were managed pharmacologically. No instance of miniplate failure or infection occurred. In all cases, there was sufficient relief and no instance of recurrent dislocation was observed [Figure 4]. One-sided partial, temporary facial paralysis for 3 weeks was observed in one bilateral TMJ dislocation case. All cases were comfortable during execution of normal range of TMJ motion during follow-up and no instance of abnormal jaw “clicking” noise was felt or reported by any of the patients.

Discussion

Anatomically, TMJ dislocations are classified as follows: Type I – condylar head is below the tip of the eminence, Type II – condylar head is in front of the tip of the eminence, and Type III – the condylar head is high up in front of the base of the eminence.[11] The surgical goals must continue to be to reduce or return to normal TMJ anatomy, improve function, and restore normal occlusion with the procedure posing no or minimal morbidity and squeal (risk of ankylosis) as well as eliminating the chance of recurrence.[12] There is no universally single algorithm followed to fetch desired result. However, the treatment algorithm and steps suggested by Marqués-Mateo et al. are widely recommended.[2]

In the present cases too, all cases were long standing than those suggested by Marqués-Mateo et al., but at a much younger age and more common among females, as reported by Rattan and Arora reports.[2,12] There could be the difference in the study population characteristics as our values are much closer to Indian population report by Rattan and Arora.[2,12]

As the patients presented with the disease, the etiopathogenesis and exact causative factors could not be elicited owing to poor oral history and potential bias. Although there are several conservative techniques mentioned, surgical options include open reduction, condylar resection or reduction, increase or decrease in the height of the eminence, removal or repositioning of the meniscus, sometimes extended with coronoidectomy, and/or the kind of the surgery with hooks.[2] To achieve the goals of surgical management, procedures such as capsulorraphy, meniscectomy, eminectomy, capsular ligament plication, and shortening are performed, but come with complications such as facial asymmetry and a limited degree of jaw movement while the present method employed has been proved to be reliable and time tested, if performed properly.[1] The presence of a foreign body in joint space, possibilities of improper positioning or loss of stability of screw fixation, and miniplate fractures are some of the potential complications, but if adequately planned, limitation of jaw movements can be effectively overcome.

The present series of cases provides evidence that TMJ dislocation in India is not different from the rest of the world. The case selection, understanding etiopathogenesis, and instituting appropriate therapy would give the best results. For the conditions described, the technique presented herein provides good long-term relief, especially when all other conservative treatment methods fail.
Conclusion

A single-center experience of surgical management of TMJ dislocation is presented. Effective treatment planning is required to minimize complications, and if performed optimally, hook with or without graft provides the best, long-standing results, increasing the quality of life of patients.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Conflicts of interest

There are no conflicts of interest.

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