

Arthroscopic Reduction Of Acute, Traumatic, Nonreducing, Anteriorly Displaced Disc of TMJ: Report Of First Indian Case

Adwait Kulkarni^{1*} and Aniruddha Wankhede Patil²

¹Department of Maxillofacial Surgery, Trimurti Hospital, Pune, Maharashtra, India

²Maxillofacial surgeon, Akola, India

***Corresponding Author:** Adwait Kulkarni, Department of Maxillofacial Surgery, Trimurti Hospital, Pune, Maharashtra, India.

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Abstract

Arthroscopy is a procedure for direct visual inspection of internal joint structures. Onishi in 1970 was the first to report arthroscopy of the human temporomandibular joint. Currently, this technique of diagnosis-treatment is being used on growing numbers of patients with a diverse variety of intra-articular TMJ pathology. However, it is not so commonly practised in the Indian scenario, primarily because of the restrictive cost of armamentarium, lack of training and technical sensitivity demanded for the procedure. Here, we would like to report the first Indian case of acute, traumatic nonreducing anteriorly displaced disc reduced via the arthroscopic approach.

Patient with non-reducing anterior disc displacement and complaining of severe pain in TMJ was treated with arthroscopy. The procedure was performed using a modified nasal endoscope and indigenously designed custom made arthroscope under general anaesthesia. Short-term follow-up of arthroscopically assisted TMJ disc repositioning surgery showed good outcome, which was determined using clinical assessment in terms of, improvement in inter-incisal distance in millimeters; and the pain which was evaluated by using a visual analogue scale (0-10).

TMJ arthroscopy is an effective surgical procedure not only for diagnostic purpose but also for the treatment of temporomandibular joint disorders; this approach to the TMJ is also advantageous as it takes less operative time, less invasive, faster recovery and with a good success rate of 82% when weighed against other surgical and diagnostic procedures like MRI and arthrocentesis.

Keywords: TMJ Arthroscope; Custom Made; Internal Derangement

Introduction

A wide variety of surgical techniques have been performed over the past 50 years in the treatment of intra-articular temporomandibular disorders (TMD) [1]. Arthroscopy has been used to diagnose and treat intra-articular pathologies since 1933 [2]. This diagnostic treatment technique is now common, most frequently being used on knee and elbow injuries. Arthroscopy of the temporomandibular joint (TMJ) was first reported in 1975 [3], and within the last few years has gained popularity. Currently, this technique of diagnosis-treatment is being used on growing numbers of patients with a diverse variety of intra-articular TMJ pathologies. However, it is not so commonly employed in the Indian scenario mainly because of the cost factor and technical demands. Most of the reports published on TMJ arthroscopy have been discussions on technique, but only a few have investigated arthroscopy's diagnostic and treatment capabilities [2,4-6]. Here we report the case of a 26-year old female suffering from non-reducing anteriorly displaced disc successfully treated by arthroscopy and indigenous custom made arthroscope.

Case Report

A 26-year-old female patient reported to the department of oral and maxillofacial surgery with the chief complaint of severe pain in left temporomandibular joint since last 2 months. The patient was apparently alright some days back when she suffered from trauma to her

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lower jaw. Then she noticed progressively reduced mouth opening and painful jaw movements. A conservative management in the form of medications was taken for the same problem at a private clinic but did not show any improvement which brought her to our department. By this time, the mouth opening was severely restricted and associated with continuous, severe pain (VAS score: 9). Clinical examination revealed markedly reduced mouth opening of just 8 mm (Figure 1) and tenderness over the left TMJ area. Anterior disc displacement was diagnosed clinically and confirmed radiographically. After routine investigations, the patient was taken for TMJ arthroscopy under general anaesthesia. A proper informed consent was taken from the patient. All sterilisation and aseptic measures were taken care of and painting, draping of the patient was carried out. The zygomatic arch and the condyle were then palpated. The condyle was then forced in anterior position by the assistant and the glenoid fossa was identified. After the condylar head of the TMJ had been determined, a marking line and puncture points were made on the skin surface with dye. The puncture site was located by manipulating the mandible antero-inferiorly. Local anaesthesia (lidocaine 2%) with vasoconstrictor (adrenaline 1:2,00,000) injection was given into the capsular region. Next, the custom made sharp trocar (Figure 2) with its cannula was inserted to the depth of the capsule followed by the trocar of blunt end to reach anterior aspect of the superior compartment up till the posterior slope of articular eminence. A 2 mm endoscopic camera of 50 mm length (Figure 3) was then introduced through the sleeve and a proper visualisation of the joint space was carried out.



Figure 1: Pre-Op Mouth Opening.



Figure 2: Indigenously Designed Custom Made Trocar.

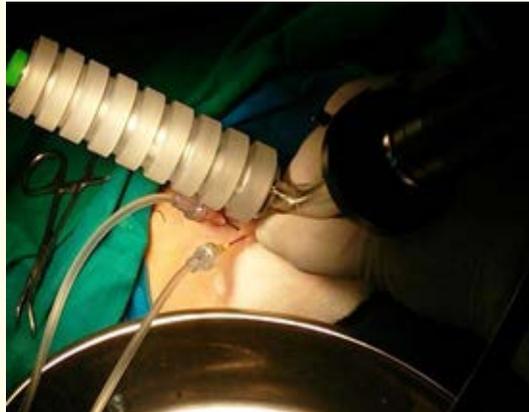


Figure 3: Intra-Operative Picture.

Summary of arthroscopic findings

1. Retrodiscal tissue was noted inflamed.
2. Roof of glenoid fossa
3. Articular disc
4. Inflammatory changes on bone
5. Adhesions

The capsule was stretched. Exploration of anterior joint space and gentle manipulation with the blunt probe to release the disc was done. Disc unfolded and visualised to be seated on to the condylar head. Movement of the disc and condyle visualised in tandem. On table mouth opening of 40 mm was achieved. Dexamethasone was injected into the superior joint space and the watertight dressing was given.

Post-operative healing

The patient was discharged on the same day after complete recovery. Post-operative healing was uneventful and post op mouth opening of 30 mm (Figure 4) was recorded Figure 2. VAS showed an immediate decrease in TMJ pain (VAS score: 1). Subsequent follow-up showed satisfactory mouth opening, no pain and no skin healing visible scar (Figure 5).



Figure 4: Post-Op Mouth Opening.



Figure 5: Post-Op Healing with no visible scar.

Discussion

TMJ is one of the first joints to be affected even in early age, with multifaceted etiology. Some of these etiologies include improper orthodontic treatment, faulty restorations, improper prosthetic rehabilitation, para-functional habits and even some physiological age changes like reduction in vertical dimension due to attrition. In this manner, the TMJ may undergo deterioration through the life.

Times are changing and Indian surgeons will need to start thinking about other TMJ disorders that have previously gone under the radar. A growing Indian middle class with greater access to health facilities will demand treatment for TMJ disorders like myofascial pain and dysfunction, internal derangement and osteoarthritis which Oral and Maxillofacial Surgeons must be prepared to manage. TMJ surgery is not so common in India because technically it is one of the more difficult surgical dissections in the maxillofacial region. While the close proximity of the facial nerve is the main reason for the difficult surgical access, other important anatomical structures such as the terminal branches of the external carotid artery and accompanying rich plexus of veins also add to the complexity of the dissection. With the middle cranial fossa above and the middle ear behind the TMJ, there is little room for surgical error as both these cavities are only a few millimeters away from the joint itself [7]. TMJ arthroscopy is one of the better options for TMJ disorders especially for young patients as it is less invasive and there are fewer complications involved when compared with open TMJ surgery.

TMJ arthroscopy is useful when the disc has not yet been deformed. Superior joint compartment adhesions and disc immobility can be treated during the arthroscopic procedure, leading to resolution of symptoms and return of joint function [8]. The adhesions may cause retention of the disc in its anteriorly displaced position, which may explain the failure to respond to conservative treatment.

Indications for arthroscopy [9]

Indications for arthroscopy are radiological bone changes in TMJ characteristic to osteoarthritis with disc displacement or deformity and non-effectiveness of conservative treatment with NSAIDs, intraoral splints. In practice, the decision to operate and the choice of the method seems to be a matter of the individual surgeon's training, experience, and attitude toward the surgical management of TMJ disorders. Involvement of the TMJ in patients with rheumatoid arthritis or other connective tissue diseases is rather common and arthroscopy with simultaneous biopsy is indicated in these situations. Post-traumatic complaints may also be an indication for arthroscopy. Arthrocentesis is considered as an intervening treatment modality between nonsurgical treatment and arthroscopic surgery.

Contraindication for arthroscopy [9]

Arthroscopy is contraindicated in case of acute arthritis.

Advantages of arthroscopy

It is less invasive and associated with lower morbidity [10] and no scar formation. Arthroscopy is an excellent tool, complementing clinical and radiological examinations. Abnormalities in TMJ can be identified earlier than by other diagnostic methods. Comparison of three different procedures (diagnostic and therapeutic) is shown in table 1.

Sr. No	MRI	Arthrocentesis	Arthroscopy
1.	Indirect vision or 2D image	No vision or blind procedure	Direct vision and 3 D image
2.	Only diagnostic value	Only therapeutic use no diagnostic	Diagnostic + therapeutic value
3.	More time required as patient has to undergo further procedures	More time required as surgeon needs diagnostic imaging before Arthrocentesis.	Less time required as diagnostic and therapeutic procedure can be done at the same time.
4.	No immediate relief from symptoms	immediate relief from symptoms	immediate relief from symptoms
5.	No other procedure can be done	No other procedure can be done	Other procedure can be performed like disk repositioning, suturing, condylar head shaving and laser with advanced armamentarium.
6.	-	Success rate is 75 % [15]	Success rate is 82 % [15]
7.	More expensive	More expensive	Less expensive with indigenously designed custom made arthroscopy trocar

Complications

Intra- and postoperative complications for arthroscopy are rare e.g. bleeding. Extravasation of irrigating fluid into surrounding tissues may occur sometimes due to leakage of the irrigating fluid into the surrounding tissues caused by accidental perforation of the TMJ capsule. This complication can be easily avoided if the surgeon always checks the out - flow from the outflow cannula. Otologic complications and nerve damage have been reported [12,13]. Injury to superficial branches of the facial nerve [8].

Conclusion

TMJ arthroscopy is an effective surgical procedure not only for diagnostic purpose but also for the treatment of temporomandibular joint disorders; this approach to the TMJ is also advantageous as it takes less operative time, less invasive, faster recovery and with a good success rate of 82% when weighed against other surgical and diagnostic procedures like MRI and arthrocentesis. TMJ arthroscopy with the modified nasal endoscope and indigenously designed custom made arthroscopy trocar is a cost-effective way to treat the TMJ disorders especially internal derangement of TMJ in the Indian scenario.

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