



Temporomandibular joint chronic closed lock: Spontaneous resolution following surgical arthroscopy

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ABSTRACT

Purpose: This study evaluated the efficacy of surgical arthroscopy in the management of patients with temporomandibular joint chronic closed lock.

Patients and Methods: Fifteen TMJs (Twelve patients) suffering anterior disc displacement without reduction and chronic closed lock were enrolled in the study. Arthroscopic lysis and lavage of the superior joint compartment was done under general anesthesia for all patients.

Results: The results showed significant resolution of clinical signs and symptoms of TMJ chronic closed lock (pain and tenderness) and full restoration of normal range of motion (maximum interincisal opening, lateral excursions and protrusive movements) and regain of chewing ability.

Conclusion: Temporomandibular joint surgical arthroscopy is an effective and minimally invasive modality in treatment of TMJ closed lock.

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1. Introduction

Internal derangement (ID) of the temporomandibular joint (TMJ) is one of the most common forms of temporomandibular disorders (TMD) [1]. The term ID comprises anterior disc displacement with or without reduction, perforation of the articular disc or of the retrodiscal tissue, and various degenerative changes of the disc and/or the articulating surfaces [2]. The most commonly used classification to describe the severity of ID was proposed by Wilkes in 1989. The Wilkes classification consists of 5 stages based on clinical, radiologic, and intraoperative findings, varying from a slight forward displacement with symptom-free normal joints to essentially degenerative arthritic changes with severe clinical symptoms [3].

Anterior disc displacement of the TMJ represents an intra-capsular different conditions are recognized: anterior disc displacement with reduction (DDWR), where the proper

relationship between the disc and condyle is restored during maximum mouth opening; and anterior disc displacement without reduction (DDWOR), as described by Dolwick [4] where the disc stays anterior to the condyle and prevents maximum mouth opening. DDWOR is clinically apparent by reduced mandibular movement and pain [5]. [6] [7].

The patients with displaced discs are usually treated conservatively. Open arthrotomy of the TMJ has been widely advocated for treatment of ID with closed lock when conservative treatment has failed. More recently, arthroscopic surgery of the TMJ has increased in popularity due to its conservative approach compared to open surgery, fewer complications, and being a one day surgery. It allows surgeons to diagnose and treat intra-articular conditions directly with a minimally invasive technique that reliably reduces pain and increases the mandibular range of movement [8]. [9] [10] The aim of the present study was to evaluate the outcome of a standard arthroscopic lysis and lavage of the TMJ in patients with ID and chronic closed lock.

2. Patients and Methods

Fifteen TMJ (twelve adult patients) suffering from DDWOR and

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closed lock (Wilkes class II, III) were enrolled in the study. All patients were females with age range from 19 to 48 years (average 33.5 years).

Inclusion criteria were: a verified clinical diagnosis of DDWOR that was confirmed using magnetic resonance imaging (MRI) of the TMJ; 3-month of conservative treatment (including occlusal splint and physiotherapy) with unsatisfactory results; unilateral or bilateral disorder; and a patient without comorbidities (especially endocrine, rheumatological or skeletal diseases). On the other hand, patients were excluded from this study if they did not adhere to our inclusion criteria; or were unable to attend throughout entire follow-up period (1 year); and superimposition of other TMD (as follows, but not limited to: dislocation, discal perforations).

2.1. Preoperative assessment

The patients were examined clinically as well as radiologically using MRI.

Clinical examination consisted of palpation of the TMJ region and masticatory muscles. Mandibular movements: 1) maximal interincisal opening (MIO), 2) lateral movements, and 3) protrusion were measured and tabulated. The patients filled out a self assessment visual analog scale (VAS) for 1) Pain (where 0 equals no pain and 10 is the most severe pain); 2) Tenderness (where 0 equals no tenderness and 10 is the most severe tenderness); 3) Chewing (where 0 equals fluid diet only and 10 is the normal chewing).

2.2. Arthroscopic surgical procedures

The surgical procedure was carried out under general anesthesia. A sterile cotton pellet was placed in the external auditory canal followed by routine surgical field scrubbing with povidone iodine solution and the patient was draped in the usual manner with sterile adhesive sheets. To reach the TMJ arthroscopically the inferolateral approach described by Murakami and Ono was used [11].

The first puncture was placed at the maximum concavity of the glenoid fossa. A sharp trocar protected by an outer cannula was advanced through the puncture point till contacting the bone of lateral crest of the fossa. Puncture of the capsule was accomplished by rotating the trocar till a pop was felt, denoting gaining access to the upper joint compartment. Once the capsule had been pierced, the sharp trocar was removed to avoid scuffing of the articular surfaces and a blunt obturator was introduced in the cannula for further insertion into the joint cavity (Fig. 1).

Examination of the upper compartment of the TMJ was performed using a 70° telescope (Karl Storz, Tuttlingen, Germany). The arthroscopic live image was received on the connected medical



Fig. 1. Puncture of skin and capsule with sharp trocar then replaced by blunt obturator.

monitor and was used to verify for proper placement in superior compartment. After receiving arthroscopic image of the superior joint space, further capsular distension and intermittent lavage with isotonic saline were maintained through the irrigation system. The upper joint compartment was examined postero-anteriorly from the posterior pouch, along the intermediate zone to the anterior pouch and was swept clear under constant irrigation, suction and capsular distention (Fig. 2).

Intraarticular adhesions that failed to dislodge through hydraulic manipulations, were further addressed using hand instruments (namely: the grasping forceps and hooks); resistant adhesions and organized blood clots were further trimmed using motorized shavers. Surgical arthroscopic instruments (hand or motor driven) were introduced through a second working cannula (Fig. 3). Following release of the TMJ disc as visualized intra-capsularly by its movements in co-ordination with the condylar head during cycles of mouth opening and closure, the upper compartment was thoroughly irrigated with isotonic solution and 2 ml of betamethasone were injected into the joint compartment.

Immediately following recovery the patients started self-administered physiotherapy training exercises and splint therapy. Patients were followed up on weekly basis for the first postoperative month; fortnightly till the third postoperative month; then on a monthly basis till the end of the follow up period (1 year).

2.3. Postoperative assessment

Maximum interincisal opening, lateral excursions, protrusion, VAS for pain, tenderness and chewing were recorded immediate, 1 week, 1, 3, 6, 9, 12 months postoperatively for all patients. Four patients (5 TMJs) have been followed up for over 2 years.

2.4. Success criteria

The treatment was considered successful if mouth opening capacity was ≥ 40 mm at the end of the study and TMJ pain according to VAS as assessed by patients as ≤ 1 .

2.5. Statistical analysis

Numerical data for VAS, MIO, lateral and protrusive movements were tabulated for statistical analysis. Quantitative data was in the form of mean and standard deviation (SD). The mean pre-operative and postoperative values were compared using paired t-test. Results were expressed in the form p-values that were differentiated into:

- *Non-significant when p-value > 0.05.
- * Significant when p-value \leq 0.05.

3. Results

3.1. Clinical outcome

No major or persistent complications were encountered in all patients and the procedure was generally perceived as a tolerable measure not necessitating overnight stay at the hospital. Two patients complained of blocked ear sensation which resolved 2 and 6 days postoperatively, respectively. One patient reported preauricular numbness that resolved 2 weeks postoperatively. Intra operative bleeding during skin and capsular puncture was encountered in one joint which was controlled by combined direct compression over the puncture point and increasing intra articular pressure. The healing of puncture sites was uneventful with no scars in all cases. Patients showed clinical improvement in the form of:

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