Arthrocentesis Procedure: Using this Therapeutic Maneuver for TMJ Closed Lock Management

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Abstract: Temporomandibular joint (TMJ) disorder is a term that encompasses a number of overlapping conditions, such as closed lock. Closed lock of the TMJ is considered a consequence of a nonreducing deformed disc acting as an obstacle to the sliding condylar head that usually causes a decrease in the maximum mouth opening and acute pain. The management of the TMJ is still controversial. Thus, arthrocentesis of the TMJ is a valuable modification of the traditional method of arthroscopic lavage, which consists of washing the joint in order to remove chemical inflammatory mediators and intra-articular adhesions, changing intra-articular pressure. TMJ disorder has always presented as a therapeutic challenge to maxillofacial surgeons. Therefore, this paper aimed to describe a clinical report of a closed lock of the left TMJ in a 19-year-old female subject who was successfully treated by arthrocentesis procedure.

Key Words: Arthrocentesis, internal derangement, minimally invasive surgery, temporomandibular joint

Internal temporomandibular joint (TMJ) derangement is a term that encompasses a number of overlapping conditions, such as closed lock. It occurs in approximately 10% of the population, with a predisposition to younger females. Limited mandibular movement in closed lock has usually been attributed to a nonreducible, anteriorly displaced disc acting as an obstacle to the gliding condyle.

Clinical signs of closed lock of the TMJ are restriction of translator movements, absence of clicking, deviation in opening the mouth toward the affected side, limitation in lateral movement toward the contralateral side, and restriction in protrusive movements, with the mandible shifting toward the affected side. Furthermore, pain is present on palpation and during open movements.

Nitzan et al4 proposed the “anchored disc phenomenon” as etiology for closed lock, considering it as an independent entity from a nonreducible anteriorly displaced disc. In the past, when the treatment for closed lock of the TMJ did not respond well to conservative methods, surgical recontouring and repositioning of the disc was indicated. In the last 10 years, arthrocentesis and hydraulic distension of the superior joint space of the TMJ has been described as an effective modality in decreasing joint pain and increasing the range of mouth opening in patients with closed lock of the TMJ.

Internal TMJ derangement has always presented as therapeutic challenge to the maxillofacial surgeons. Thus, this paper aimed to describe a case report of a closed lock of the left TMJ in a 19-year-old female subject who was successfully treated by arthrocentesis procedure.

CLINICAL REPORT

A 19-year-old female subject was referred to the Oral and Maxillofacial Surgery Department, “Dr. Mario Gatti” Municipal Hospital of Campinas, Brazil. The patient presented with complaint of decreasing of her maximum mouth opening over a period of 1 month.

Clinically, the patient presented with 22 mm in maximum mouth opening, with pain on palpation of the left TMJ, and absence of clicking, with deviation in opening the mouth toward the left side (Fig. 1). Panoramic radiographic examination showed normal bone structure of both TMJs (Fig. 2). Thus, an occlusal appliance was
performed on the patient, and she was prescribed a nonsteroidal anti-inflammatory drug (NSAID), muscle relaxant, and a restricted diet during the first week. After 1 month, 27 mm in maximum mouth opening with joint pain on palpation was found (Fig. 3). Therefore, arthrocentesis of the left TMJ under general anesthesia was proposed.

Under aseptic precautions, arthrocentesis was performed in the superior joint space. The points of needle insertion were marked on the skin. A line was drawn from the middle of the tragus to the outer canthus. Entry points were marked along this canthotragal line. The first point corresponding to glenoid fossa was marked 10 mm from the midtragus and 2 mm below the line, and the second point corresponding to articular eminence was marked 10 mm from the first point and 10 mm below the line (Fig. 4A). Thus, a 20-gauge needle was then introduced at the first point and 2 mL of Ringer solution was injected through this needle to distend the joint space. Another 20-gauge needle was then inserted at the second point to establish a free flow of the solution through the joint space. A syringe filled with Ringer solution was injected under pressure into the superior joint space through the first needle, and a second needle provided the outflow for the saline (Fig. 4B). A total of 300 to 400 mL of Ringer solution was used to lavage the superior joint space. At the end of lavage, dexamethasone was injected to alleviate any intracapsular inflammation. After removing the needles, the patient’s lower jaw was gently manipulated in the vertical, protrusive, and lateral excursions to free the disc.

Postoperatively, the patient was instructed to use a NSAID and muscle relaxant, and a restricted diet was advised for 1 week. An occlusal appliance and physiotherapy in the form of jaw-opening exercises were also recommended. The patient has been free of recurrence for 6 months, demonstrating good mouth opening (about 42 mm), without pain of the left TMJ (Fig. 5).

**DISCUSSION**

Internal TMJ derangement is characterized by displacement of the intra-articular disc, resulting in clicking and popping sounds. The most common causes are trauma, which results in an immediate displacement of the disc, or chronic parafunction, which results in degenerative changes in the articular surfaces, increased friction, and gradual disc displacement.

The literature reveals that more than 25% of the entire population has TMJ derangement; moreover, they are usually treated with nonsurgical methods such as medications, physiotherapy, and occlusal splints in the initial period.8 Thus, when these techniques are unsuccessful, they are usually managed by surgical methods. The objective of surgical management for any disease process is the full restoration of function with improvement of the quality of life. Therefore, some studies have reported good outcomes using open surgical techniques for management of TMJ derangement; however, they are associated with surgical risks and potential long-term sequelae have been reported.9

In this context, arthrocentesis and hydraulic distension of the TMJ has been described as an effective modality in decreasing joint pain and increasing the range of mouth opening in patients with TMJ derangement, especially in closed lock of the TMJ.2-7 Success rates for TMJ arthrocentesis in closed lock, as reported in literature, have varied from 70% to 95%.3,5
The presence of inflammatory cells and inflammatory mediators, including arachidonic acid metabolites and cytokines, was demonstrated in symptomatic TMJs. Thus, lavage of the superior joint space reduces pain by removing inflammatory mediators from the joint, as found by other studies. Arthrocentesis under sufficient pressure can also remove adhesions, improving mouth opening by removing intra-articular adhesions, eliminating the negative pressure within the joint, recovering disc and fossa space, and improving disc mobility, which reduces the mechanical obstruction caused by the anterior position of disc. Recently, Neeli et al have reported 96% of significant reduction in pain using arthrocentesis. These authors suggested that the pain reduction was attributed to the high-pressure irrigation which washes away inflammatory mediators and providing pain relief. In addition, pain relief was found by the authors of this present clinical report after 2 weeks of the arthrocentesis procedure.

In summary, arthrocentesis is a minimally invasive procedure and a simplified alternative to the most common arthroscopic surgical method. It can produce long-term relief of pain and improve mouth opening in patients with TMJ closed lock, as observed by the authors of this present clinical report. In conclusion, when conservative means failed, arthrocentesis should be the first-line option for management of TMJ closed lock.

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REFERENCES