

Evaluation of Complications of Arthrocentesis in the Management of the Temporomandibular Joint Disorders

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ABSTRACT

Objective: To evaluate intraoperative and postoperative complications of arthrocentesis.

Material and Methods: This retrospective study examined 102 arthrocentesis procedures performed in 96 patients between December 2015 and July 2017. All complications were evaluated.

Results: Complications of arthrocentesis included temporary swelling (0.98%), hemorrhage (0.98%), facial paralysis (1.96%), lingual anesthesia (0.98%), inferior nerve anesthesia (0.98%), tachycardia (0.98%), syncope (2.94%), dizziness (4.9%), severe pain (0.98%), and limitation of mouth opening (1.96%).

Conclusions: Arthrocentesis is considered a minimally invasive procedure, and complications are mostly temporary, but serious complications may occur due to the temporomandibular joint's proximity to the cranial region and vascular nerve tissues.

Key words: TMJ, arthrocentesis, complication

INTRODUCTION

Temporomandibular joint (TMJ) disorders are a clinical condition that causes pathologic changes in the surrounding tissues and loss of function of masticatory muscles in the maxillofacial region. In recent years, the incidence of TMJ diseases has increased with the level of stress in our modern world. [1,2] Internal disorders are responsible for 80% of TMJ disease, [3] which is characterized by pain, joint sounds, limitation of mouth opening, or irregularity of jaw function. [4] The treatment of internal disorders is conservative (non-invasive) or

surgical (invasive). Conservative treatments consist of occlusal splints, physical exercises, massage of the masticatory muscles, heat application, manual therapy, analgesics, and muscle relaxants. Surgical approaches are of two types: direct (open surgery) and indirect (arthroscopy or arthrocentesis) surgery. [2] In patients for whom conservative treatments are not successful, indirect approaches are preferred to direct surgery. [3] Arthrocentesis has been shown to increase limited mouth opening, reduce pain, and improve masticatory function in the temporomandibular region; however, complications can occur during arthrocentesis procedures. [1,2,5,6] In this report, we explored complications encountered during and after arthrocentesis to increase our understanding of arthrocentesis.

MATERIALS AND METHODS

This retrospective study recruited 96 patients who were admitted to Adiyaman University, Faculty of Dentistry, Department of Oral and Maxillofacial Surgery between December 2016 and July 2017 and underwent arthrocentesis. After clinical and radiological examinations were employed to diagnose all patients, a total of 102 arthrocentesis procedures were performed by the same surgeon on the 96 patients.

Arthrocentesis procedure

The arthrocentesis procedure was performed using two needles, as described by Nitzan et al. [7] After cleaning the TMJ

region with povidone iodine, local anesthetic (4% articaine hydrochloride with 1: 200,000 epinephrine) was injected gently into the upper joint space. Next, two 21-needle applicators were inserted into two guide points (described by Nitzan et al. [7]), and the upper joint space was irrigated with approximately 150 ml of ringer lactate. Finally, sodium hyaluronate was injected into the joint space. Immediately after each arthrocentesis procedure, the operated region was compressed for 5 min. All patients were discharged after 2 hours of follow-up and were prescribed a soft diet and analgesia and anti-inflammatory drugs for 7 days. The patients were then followed up clinically at 1, 7, and 30 days after the procedure. Complications during and after the arthrocentesis procedure were noted. Ethical approval was obtained from the Ethics Committee of Adıyaman University, and the study was conducted in accordance with the principles of the Helsinki Declaration. All patients signed an informed consent form.

RESULTS

The gender distribution of the patients was 56.25% female and 43.75% male, and the mean age was 24.05 (20 to 52) years. Complications included temporary swelling (0.98%), hemorrhage (temporary intracranial bleeding) (0.98%), facial paralysis (1.96%), lingual anesthesia (0.98%), inferior nerve anesthesia (0.98%), tachycardia (0.98%), syncope (2.94%), dizziness (4.9%), severe pain (0.98%), and limitation of mouth opening (1.96%). The overall rate of complications of arthrocentesis was 17.65% in all patients (Table 1).

Management of complications

- Temporary swelling of preauricular region due to fluid extravasation was resolved less than one day.
- Hemorrhage due to injury of temporal superficial artery was stopped by pres.

- Temporary facial paralysis, lingual and inferior nerve anesthesia was resolved within four hours.
- Tachycardia was observed during application of anesthetic. Afterwards the patient healed.
- Syncope resolved in less than fifteen minutes.
- Dizziness was resolved in less than one day.
- Severe pain and limitation of mouth opening were resolved in most five days.

Table 1.

Complications	Cases
Local Swelling (< 3 days)	1 (0.98%)
Local Swelling (> 3 days)	0 (0%)
Hemorrhage* (Temporary intracranial bleeding)	1 (0.98%)
<i>Neurologic Complications</i>	
-Facial nerve paresthesia (< 2 hours)	2 (1.96%)
-Lingual nerve anesthesia (< 2 hours)	1 (0.98%)
-Inferior nerve anesthesia (< 2 hours)	1 (0.98%)
<i>Cardiovascular problems</i>	
-Bradycardia	0 (0%)
-Tachycardia*	1 (0.98%)
<i>Synkope*</i>	3 (2.94%)
<i>Dizziness</i>	5 (4.9%)
<i>Severe Pain (during arthrocentesis procedure)</i>	1 (0.98%)
<i>Functional problems</i>	
-Limitation of mouth opening	2 (1.96%)
-Temporary unilateral open bite	0 (0%)
<i>Auditory Complications</i>	
<i>Needle Breakage</i>	0 (0%)
Total Complications	18 (17.65%)

* Arthrocentesis could not be performed due to the complications.

DISCUSSION

TMJ lavage was first performed by Ohnishi [8] via arthroscopy, and lavage of the TMJ without arthroscopy were first performed by Murakami et al. [9] The arthrocentesis technique that is frequently performed today, namely lavage of the upper TMJ joint space, was described in 1991 by Nitzan et al. [7] This approach was used remove the inflammatory mediators and regulate the disc–fossa relationship. Subsequently, arthrocentesis has been accepted as a simple, minimally invasive, low cost, and highly effective method. [7,10]

Arthrocentesis is considered a reliable method, but various complications can occur during this procedure. These can vary according to the anatomy of the joint, the physician's experience, and the arthrocentesis technique. [2,11,12] Potential

serious complications include facial nerve injury, preauricular hematoma, superficial temporal artery injury, arteriovenous fistula, intracranial bleeding, intracranial perforation, severe bradycardia, needle breakage in the joint, failed needle penetration, and allergic reaction. Furthermore, possible temporary complications include temporary facial paralysis, lingual anesthesia after local anesthesia, limitation of mouth opening, severe pain during arthrocentesis, temporary swelling in periarticular region, hemorrhage, hearing problems, dizziness, and syncope. [1,2,10,11]

In 22 arthrocentesis cases reported by Şentürk et al., [10] pain occurred in 27.3%, and temporary facial paralysis in 21.2%. Vaira et al. [1] reported that among 433 arthrocentesis cases, 95.1% showed swelling due to irrigation fluid leakage, and 23.5% had external auditory canal problems; these patients with complications recovered within a few days. A total of 68.8% of patients showed an increase in the vertical size due of the upper joint space on the side of the arthrocentesis; thus, an open bite was temporarily seen on the affected side. In addition, 65.1% of patients reported paresthesia in the frontalis and orbicularis oris during anesthesia. In the present study, periauricular hematoma was reported in two patients, one of whom required surgical drainage, and only one patient experienced vertigo, which lasted for 7 hours, due to the anesthetic solution's entering the semicircular canal. [13] Other studies reported complications including extradural hematoma, [12] severe bradycardia, [6] periauricular infected swelling, [7] and numbness in the tongue and lips after alcohol use. [14]

The single-needle technique was reported to be less risky than the two-needle technique, [2] although our study used the two-needle technique, and fewer complications were observed in our patients than in other studies due to the correct application of the arthrocentesis technique and the surgeon's experience. Very few

studies reported in the literature have examined complications of arthrocentesis. [1,10] Thumboo and O'Duffy [15] reported no cases of hemorrhage after arthrocentesis using an anticoagulant in 32 patients. In our study, a cardiac patient developed tachycardia, and arthrocentesis was not completed. Tvrđy et al. [2] reported that the rate of complications reported in the literature ranged from 2 to 10%. The rate of all complications in our study was 17.65%, including the following: dizziness (5), limitation of mouth opening (2), lingual (1) and inferior alveolar (1) anesthesia during arthrocentesis, severe pain in the postoperative period (1), and temporary local swelling (1). In addition, we observed syncope (3), tachycardia (1), and hemorrhage when intraarticular anesthesia was injected (1); arthrocentesis could not be completed in these five patients. These complications receded in a short time, and no serious complications have occurred in our patients

CONCLUSIONS

In patients with TMJ disease who cannot be treated using conservative methods, arthrocentesis is considered a minimally invasive procedure that seems the most reliable method to perform before major surgery. Although complications are mostly temporary, serious complications can occur due to the proximity of the cranial region and vascular nerve tissues.

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