EurAsian Journal of Oral and Maxillofacial Surgery
Official publication of AÇBİD (Association of Oral and Maxillofacial Surgery Society)

CASE REPORT

Subcutaneous Emphysema After Arthrocentesis of The Temporomandibular Joint: A Rare Case Report

Temporomandibular Eklem Artrosentezi Sonrasında Oluşan Subkutanöz Amfizem: Nadir Bir Olgu Sunumu

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ABSTRACT

When conservative treatments prove insufficient in alleviating symptoms of temporomandibular disorders (TMD), arthrocentesis may be considered an effective option. Although arthrocentesis generally has a low complication rate, there have been reports of serious complications. This case report presents the development of subcutaneous emphysema in the buccal tissue following temporomandibular joint (TMJ) arthrocentesis. Thorough investigation into potential complications and increased awareness are vital to ensuring patient safety and improving treatment outcomes.

Keywords: TMJ; arthrocentesis; complications; subcutaneous emphysema

ÖZET

Temporomandibular bozuklukların (TMB) tedavisinde konservatif tedaviler semptomları hafifletmede yetersiz kaldığında, artosentez etkili bir seçenek olarak değerlendirilebilir. Artrosentez genellikle düşük komplikasyon oranına sahip olsa da, bildirilmiş ciddi komplikasyonlar da mevcuttur. Bu vaka raporunda TME artrosentezini takiben bukkal dokuda subkutan amfizem gelişimi sunulmaktadır. Potansiyel komplikasyonların daha ayrıntılı bir şekilde araştırılması ve farkındalığın arttırılması, hasta güvenliğini sağlamak ve tedavi sonuçlarını iyileştirmek için hayati öneme sahiptir.

Anahtar Kelimeler: TME; artrosentez; komplikasyon; subkutanöz amfizem

Submission Date: May 1, 2024
Acceptance Date: September 11, 2024
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INTRODUCTION

Temporomandibular disorders (TMD) are a group of disorders affecting the temporomandibular joint (TMJ) itself, masticatory muscles, and associated structures.[1] Among intra-articular disorders of the TMJ, disc displacements (with or without reduction), degenerative joint diseases, and subluxation are commonly encountered.[2] Disc displacement is the predominant intra-articular cause of TMD, which may end in severe degeneration of the joint structures.[3]

Temporomandibular disorders are typically managed through two main types of therapy: non-invasive (conservative) and invasive approaches. Conservative treatment includes counseling, occlusal splints, pharmacotherapy, physical therapy modalities and low-level laser therapy. Invasive treatment can be divided into surgical and minimally invasive approaches, including arthrocentesis.[4, 5]

Arthrocentesis is an effective, minimally invasive treatment method when conservative treatment fails to improve symptoms. Typically, arthrocentesis targets the superior joint cavity for irrigation due to its accessibility, aiming to reduce inflammation and facilitate disc release by removing fibrous tissues within the joint cavity.[6, 7] While the complication rate of TMJ arthrocentesis is generally low, there are documented instances of complications that require attention.[8]

Subcutaneous emphysema (SE) is known to be caused by the invasion of gas into the subcutaneous tissue. SE in dentistry often results from the use of air turbines, air syringes, carbon dioxide lasers, and irrigation with hydrogen peroxide solution during root canal procedures.[9] SE is typically identifiable through palpable crepitus, snowball crepitation, and rapid swelling. To our knowledge there has been no report in the literature about SE occurring after TMJ arthrocentesis. The aim of this report is to present the management of an SE case that occured after TMJ arthrocentesis.

CASE REPORT

A 43-year-old systemically healthy female patient presented to our clinic with complaints of intense pain in the left preauricular region, rated at 8 on the Visual Analog Scale (VAS).

Clinical examination revealed tenderness in the left preauricular region as well as in the temporal and masseter muscles upon palpation. It was noted that the patient had a mouth opening of 35 mm, with deviation to the left side upon opening. Magnetic Resonance Imaging (MRI) revealed effusion in the upper joint space, with the disc positioned anteriorly in both closed and open-mouth positions. (Figure 1) Based on the clinical and radiological examinations, the patient was diagnosed with left-sided TMJ disc displacement without reduction (DDwoR).

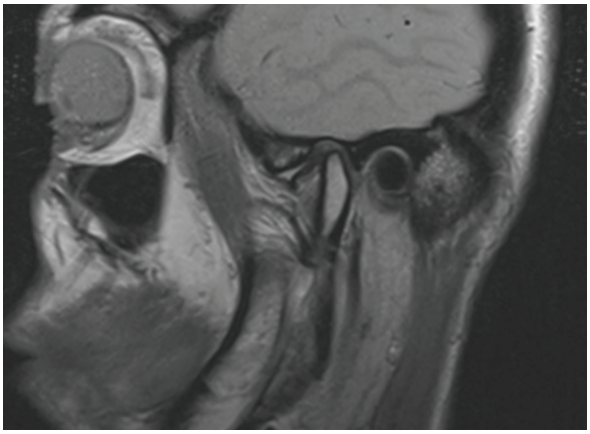

Figure 1. The MRI examination revealed effusion in the upper joint space, with the anterior disc positioned in the closed-mouth position and appearing normal in shape.

The patient was prescribed a non-steroidal anti-inflammatory drug (NSAID) (tenoxicam, 20 mg, 1 tablet orally once daily) for two weeks, along with routine recommendations. At the follow-up appointment, there was no improvement in her symptoms, and arthrocentesis under sedation was planned. The patient provided informed consent.

The procedure was done under IV sedation (Midazolam, 0.03-0.1 mg/kg; Remifentanil, 0.5-1 micrograms/kg/min). The skin surface was disinfected using povidone-iodine (Baticonol, Dermosept, ALG Türkiye). An auriculotemporal nerve block was administered with 2 cc of articaine HCl solution (Ultracain-DS; Hoechst Marion Roussel, Türkiye). The needle placement was performed according to the modification of Laskin D.[10] A line was drawn from the middle of the tragus to the lateral canthus of the eye. Subsequently, the first entry point was marked 10 mm anterior to the tragus along this line and 2 mm below it, while the second entry point was positioned just 3-4 mm anterior to the first needle in the posterior recess. A 20-gauge needle was inserted into the upper joint cavity at the posterior point, and negative pressure was obtained during pumping,

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confirming that the needle was in the correct position. After that, the anterior needle was inserted into the cavity and an outflow was obtained. The joint was lavaged with 50 ml saline solution. No hemorrhagic fluid related to retrodiscal tissue damage or fluid extravasation was observed. Towards the end of the procedure, a subcutaneous swelling was detected on the ipsilateral cheek (Figure 2).

Figure 2. Post-operative subcutaneous emphysema in the buccal region.

Figure 3. Decreased swelling at postoperative 4th hour.

Examination of the sweling revealed crepitus upon palpation. The patient was observed for 6 hours in the hospital after the procedure. 60 mg prednisolone and anti-inflammatory medication (20 mg tenoksikam) were given intravenously. A reduction in the volume of the swelling was observed at the postoperative 4th hour (Figure 3). The swelling completely disappeared by the fourth day after the procedure.

DISCUSSION

TMJ arthrocentesis, pioneered by Nitzan in 1991, stands as a simple and highly effective intervention. Its main goal is to remove inflammatory agents and to loosen adhesions between the disc's surface and the the joint cavity using pressure from a cleaning solution. This procedure represents a pivotal advancement in managing TMD, offering both simplicity and effectiveness in restoring joint function and alleviating associated symptoms. Studies have reported a success rate ranging from 70% to 90% for TMJ arthrocentesis, highlighting its efficacy in managing TMD and improving patient outcomes.[11] This underscores the importance of considering minimally invasive options in the comprehensive management of TMD, particularly when conservative treatments yield suboptimal results.

The complication rate associated with TMJ arthrocentesis is generally considered low; nevertheless, reported complications do exist and warrant attention.[11] Despite being minimally invasive, care should be taken to avoid vascular and nerve injuries, and attention should be paid to the delicate bony lamina separating the upper joint space from the neurocranial structures. Damage to these structures can result in serious complications that necessitate immediate hospitalization for patient monitoring and the initiation of appropriate therapy.[12]

SE manifests as the accumulation of air within the connective tissue amidst the fascial planes. Its origins encompass trauma, iatrogenic factors, or spontaneous onset. Notably, SE in the head and neck region can present as a distinct and potentially life-threatening condition, particularly when a significant volume of air infiltrates the fascial planes. It has the potential to extend beyond the subcutaneous tissues and infiltrate into various spaces such as the retropharyngeal, pleural, mediastinal, and retroperitoneal regions.[13] In the differential diagnosis, allergic reactions, hematoma, angioedema, esophageal rupture, infection, and necrotizing fasciitis should be considered.[14] In this case, the differential diagnosis was

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made with fluid extravasation. Extravasation of irrigation fluid from the TMJ capsule laterally is seen as swelling in the preauricular region, it is a common complication of TMJ arthrocentesis and generally resolves within a day after arthrocentesis. However, in this case, the swelling was in buccal region, and upon palpation, crepitus was noted, unlike extravasation. Extravasation formation typically occurs gradually during arthrocentesis and is usually observed to increase during the procedure. However, in this case, swelling rapidly developed at the end of the procedure and extended beyond the preauricular region, spreading to the cheek.

This report documents a case of SE that occurred during the TMJ arthrocentesis procedure. In the literature, the formation of SE during arthrocentesis has not been reported. The exact cause of the complication in this case remains unclear. Suspicions arose regarding the presence of air in the syringe. However, irrigation was made effectively showing that both needles were in the joint capsule. Additionally, there was no extravasation or capsule perforation. Another consideration was the possibility of introducing air between tissues during anesthesia administration. However, the air in the syringe was checked before local anesthetic administration. In the treatment of SE, mild cases can be managed conservatively, but when there is anxiety, respiratory distress, severe pain, or suspicion of infection, the patient should be hospitalized for observation.[15] This case was considered a mild case, and the patient was managed with IV steroids. A significant reduction in swelling was observed at the end of the postoperative fourth hour.

In conclusion, although arthrocentesis is a safe procedure, it should be noted that various complications may arise during the process. Caution should be exercised at every stage of the procedure, and the patient should be closely monitored.

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