

## Case-report

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# Temporomandibular Joint Arthroscopy Complication - Parapharyngeal Edema. A case report

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### Abstract

Temporomandibular joint (TMJ) arthroscopy is considered a safe, minimally invasive surgical procedure in the treatment of TMJ derangements. With its continued use, a range of complications have been documented in the literature. Most of them take place during or immediately after the surgical procedure. This case report presents a rare case of parapharyngeal edema following bilateral TMJ arthroscopy in a 34 year-old woman. Swelling required protective intubation up to 1 hour postoperatively, but resolved completely after 48 hours without further intervention. This case report highlights the need for careful surgical planning, adequate surgical technique, and promptness in identifying and solving a complication immediately upon its manifestation, such as fluid extravasation, which is rare, but can risk airway permeability.

### Highlights

1 - Temporomandibular joint arthroscopy is a generally safe and minimally invasive surgical technique; 2 - Parapharyngeal edema is a rare but potentially serious complication following TMJ arthroscopy; 3 - Advanced degenerative TMJ changes (e.g. Dimitroulis stage 4) increase the risk of fluid extravasation; 4 - Prompt recognition and management of fluid extravasation are essential to avoid airway compromise; 5 - Surgeons must consider joint capsule integrity and outflow efficiency to reduce postoperative complications.

### Introduction

Temporomandibular joint internal derangement is a generalized term that includes disorders that interfere with the normal functioning of the TMJ. Arthroscopy is an efficient method of diagnosis and treatment of TMJ derangements.[1]

TMJ arthroscopy is considered a safe technique and low-risk procedure.[2, 3] Nevertheless, several complications have been reported in the literature for the diagnosis and treatment in arthroscopic procedures, besides its rarity. González-García et al., reported several complications regarding TMJ arthroscopy. Overall complication rates are less than 8%; damage of the ear with partial hearing loss (0.21–2.2%); temporary facial nerve paresis (0.15–2.38%); are among the complications reported.[4] Arthroscopy also risk of damaging the skull base by accidentally placing the scope into a weak portion of the roof of the glenoid fossa. However, most of the complications are minor and temporary, solved with conservative management or without specific treatment.[2]

Distention of the joint occurs during arthroscopic procedures, causing an important swelling of the joint capsule, which can result in uncontrolled extravasation of fluid, risking airway permeability.[5] González-García et al. also reported edema of surrounding soft tissues, including parapharyngeal, soft palate and/or preauricular edema as a potential complication (25–17.9%) in TMJ arthroscopy.[4] However, there have been only few published cases of parapharyngeal edema after TMJ arthroscopy.[6]

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## Case Report

The authors report a 34-year-old caucasian healthy woman, presenting chronic bilateral TMJ arthralgia and limited mouth opening. She had failed to respond to conservative measures. A magnetic resonance imaging (MRI) confirmed the diagnosis of intra-articular temporomandibular derangement with a bilateral disc displacement without reduction and osteoarthritis. The patient was scheduled to have a bilateral TMJ arthroscopy under general anesthesia and nasotracheal intubation. Patient underwent level 2 TMJ arthroscopy on the right joint, with good visualization, where it was performed lysis and lavage, capsulotomy, coagulation. Finally, an infiltration with ropivacaine of the retrodiscal tissues, and bioviscosupplementation of the joint using a mixture of low molecular weight hyaluronic acid (LMHA) and platelet rich plasma (PRP) was performed.

In the left joint, an initial puncture was made with an 18-g needle in the posterior recess of the superior compartment, with backflow of the irrigation fluid confirming the correct insertion of the needle inside the joint. Subsequently, a 1.9mm arthroscope was introduced with good articular visualization. As the authors observed the articulation and anatomical references, the visualization of the inferior compartment was noticed. The arthroscope was removed, and a new puncture was made, this time approaching and successfully visualizing the superior compartment of the joint. During the surgery, the authors noticed severe destruction of the articulation, with signs of advanced chondromalacia (grade 4 and 5), with bone exposition, classified as a Dimitroulis stage 4. Interestingly, the results observed in the MRI weren't in accordance with the diagnostic TMJ arthroscopy. Because of the joint destruction and the reduced space in the joint, the authors decided not to perform operative arthroscopy. Only diagnostic arthroscopy with lysis and lavage was performed. Lavage of the joint compartment was successful, with a good circuit of lavage and output flow. Bioviscosupplementation of the joint was performed using a mixture of LMHA and PRP.

The procedure lasted for 1 hour with no apparent intercurrent. However, immediately postoperative and before extubation, the authors noticed severe swelling and edema of the left lower floor of the face and neck, and laryngoscopy performed by the anesthetist revealed a floor of the mouth and left parapharyngeal swelling, most likely because of extravasation of fluid during arthroscopy (Fig. 1). Patient maintained intubation until swelling and edema decreased, due to risk of airway obstruction. One hour later, the swelling and edema resolved sufficiently, allowing safe extubation with no risk of airway permeability. The patient went to the recovery room with almost complete resolution of the edema three hours postoperative (Fig. 2). Twelve hours post-extubation, the swelling and edema had completely resolved (Fig. 3). After 48 hours the patient had no significant pain, good maxi-

mum mouth opening, with slight bruising of the lower third of the face (Fig. 4). The patient started rehabilitation program, and presently, 6 months postoperative, the patient has no pain, no complaints during mastication, with a favorable maximum mouth opening, and no changes on the clinical examination.



**Figure 1.** Severe swelling and edema observed immediately postoperatively.

## Discussion

As the number of performed TMJ arthroscopies increases, the case reports related complications have also increased.[7]

Although the complication described in the article is uncommon; others occur somewhat more frequently – hemorrhage, postoperative pain, restricted mandibular range of movements, scuffing or laceration of the articular fibrocartilage of either the fossa, eminence, or condyle. However, such complications appear to be of uncommon occurrence.[1, 2]

There have only been a few published cases of complications of parapharyngeal edema resulting in a prolonged intubation period. Ahmed *et al.* in 2012 and Kassam *et al.* in 2013 reported one case of complication of ipsilateral parapharyngeal edema after TMJ arthroscopy with extubation postponed for 1 hour and complete resolution of the edema hours later.[6, 8] In both cases, extravasation of fluid through the medial joint capsule was attributed as the cause of the complication. Other rare complications include Horner syndrome, extravasation of fluid from the articular capsule, upper airway compression,



**Figure 2.** Edema nearly resolved at 3 hours postoperatively.



**Figure 3.** Complete resolution of edema at 12 hours.

and perforation of the middle cranial fossa.[9]

Damage to joint structures is a potential complication during TMJ arthroscopy. However, frequently, surgeons find damage to related structures inside the joint such as the synovium, disc, or medial capsule, because of the degenerative process.[2] Moreover, the joint space can be so obliterated that makes visualization and management of the instruments inside the joint a challenge to the surgeon. On the other hand, distention of the joint during an arthroscopy procedure, can result in fluid extravasation even with appropriate outflow.[5] Surgical team awareness about the inflow and outflow volumes are extremely important. The authors hypothesized that the complication of parapharyngeal edema seemed to be associated with extravasation of fluid due to a possible perforation of the medial capsule. Moreover, synovium and joint capsule could already be weakened, making the process of distention of the joint capsule with fluid extravasation to the parapharyngeal space more likely.

An in-depth knowledge of the TMJ anatomy and surrounding structures helps reduce complications associated with TMJ arthroscopy. Assessment of preoperative imaging results such as fossa depth, surrounding structures, and potential degenerative articular changes, may help to previous alert to such complications.[2] Attention to puncture depth is also important. Authors state that the middle of the joint is approximately 25mm from the skin, and alert to the fact that perforations of the medial

capsule may occur at 50mm from the skin.[2] When distention of the joint is observed, with medial capsule perforation or collapsed surrounding tissues, authors share that the procedure should be suspended in order to prevent uncontrolled fluid extravasation with risk of airway compromise.[2]

Careful surgical planning, adequate surgical technique, surgeon experience detecting unusual situations, and promptness in identifying and solving it immediately upon its manifestation, can help surgeons minimize complications rate in TMJ arthroscopy.[2]

### Conclusion

Temporomandibular joint arthroscopy has been considered a safe, minimally invasive surgical procedure in the treatment of TMJ derangements, when compared with other surgical interventions.[10] However, complications may occur, mainly, during or immediately after the surgical procedure.[7]

Complications presenting in the immediate after TMJ arthroscopy can be associated with fluid extravasation, and most of them recover uneventfully.[7, 9] Advanced degenerative TMJ joints (Dimitroulis stage 4), are more likely to undergo such complications. Joint space obliteration, difficult visualization, distention of the joint capsule, all contribute for increased risk of fluid extravasation and parapharyngeal edema. Although this complication has been reported, it is considered a rare complication. TMJ



**Figure 4.** Mild bruising at 48 hours postoperative.

surgeons should avoid continuous irrigation without a good outflow and in advanced degenerative joints, be aware of a possible extravasation related to compromise of the capsule integrity.

**Competing Interests:** None.

**Data Availability Statement:** Available upon request.

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