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CASE REPORT

Vertiginous crisis following temporomandibular joint athrocentesis: a case report

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Abstract Temporomandibular joint arthrocentesis and arthroscopy have recently exceeded open surgeries for disorders that failed to respond to conservative treatment. The efficacy of arthrocentesis in reestablishing normal mouth opening and reducing pain and dysfunctions is now commonly accepted, but in contrast to arthroscopy, there are no large series studies on arthrocentesis complications. We report the major complication occurred in our experience: a case of a patient that complained of a violent vertigo, without hearing disorders, following the procedure.

Keywords Temporomandibular joint · Temporomandibular disorders · Temporomandibular arthrocentesis · Temporomandibular arthrocentesis complications

Introduction

Temporomandibular disorders (TMDs) represent a wide range of functional changes and pathological conditions affecting the temporomandibular joint (TMJ), masticatory muscles, and other components of the oromaxillofacial region. In recent years, TMDs have become a frequent cause for seeking medical assistance, probably due to psychological tension in modern society. [1].

TMDs may be treated conservatively or surgically. Conservative treatments include bite wafers, rehabilitation exercises, isometric exercises, masticatory muscle massage, use of multiple medications (NSAID, Diazepam, etc.), and thermal and laser therapy. Surgical treatments can be invasive (open approaches) or minimally invasive, including arthrocentesis and arthroscopy. These procedures are minimally invasive and associated with few complications; therefore, they have recently exceeded open surgeries for TMDs that failed to respond to conservative treatment [2, 3]. The efficacy of arthrocentesis in reestablishing normal mouth opening and reducing pain and dysfunctions has been reported in various studies [1, 4–7] and appears to be similar to that of arthroscopy. Yet, arthroscopy has more frequent complications than arthrocentesis, which is cost-effective and can be performed in outpatients under local anesthesia [2, 8–11]. In contrast to arthroscopy, there are no large series studies that rate the arthrocentesis's possible complications.

Focusing on our experience, we report the major complication that occurred: a case of violent vertigo, without hearing disorders, complained of following the procedure. We also made a review of the literature on the arthrocentesis complications.

Case report

A 48-year-old woman, in good general health and no history for otovestibular diseases, came to our observation with a 4-year history of bilateral TMDs with limited mouth opening (18 mm), pain, and bilateral click.

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Panoramic radiograph and CT scan were negative and the MRI showed bilateral joint effusion and anterior dislocation of the disk that, on the right side, appeared thin. The patient was refractory to nonsurgical therapies (NSAID, joint rest, occlusal bite, physical therapy). Bilateral TMJ arthrocentesis was then planned.

Right TMJ arthrocentesis, as described by Nitzan et al. [12], was performed without any complications. After 1 week, the patient reported an improvement in pain symptoms and the mouth opening increased up to 26 mm.

Left TMJ arthrocentesis was performed after 2 weeks. During the injection of the local anesthetic (mepivacaine 2% with 1:200,000 epinephrine) inside the joint, the patient experienced a brief episode of vertigo that regressed independently in a few seconds. The procedure was normally completed without any other complication. Some minutes after the end of the procedure, the patient complained of a violent onset of objective vertigo, with nausea, vomiting, and grade 3, horizontal-rotatory, right-beating nystagmus. An ENT consultation was requested: the patient did not report hearing loss, otoscopy was negative, and there were no evident damages or alterations of the tympanic membrane. The violence of the attack has prevented deeper hearing and vestibular investigations. The patient was therefore admitted to stay in the hospital and supportive therapy was established with parenteral rehydration, methylprednisolone 40 mg and levosulpiride 25 mg IV every 5 h were prescribed. To alleviate nausea, metoclopramide 10 mg was administered. The acute phase of the attack lasted 5 h, then the patient reported a gradual improvement in symptoms that completely resolved itself after another 3 h. The next day, the patient repeated the ENT check that observed the complete resolution of the vertigo, with no evidence of spontaneous or evoked nystagmus. Otoscopy was negative and the audiometric test did not detect auditory disorders. The patient was then discharged. After 1 week, no auditory or vestibular symptoms were detected, joint pain was greatly diminished, and the mouth opening was increased to 31 mm.

Discussion

TMJ artrhrocentesis, first described by Nitzan et al. in 1991 [12], is a simple and effective surgical procedure with the aim of washing out inflammatory mediators, releasing the articular disk and disrupting adhesions between the surface of the disk and the joint fossa by hydraulic pressure of the lavage solution. The success rate of arthrocentesis in reducing pain and restoring articular function mentioned in the literature ranges between 70 and 90% [4, 13, 14].

Complications after TMJ punctures depend on the anatomy of the joint and its relations with surrounding structures [15].

The complication rate following arthroscopy has been the subject of numerous studies and is reported between 1.8 and 10.3% [8–11, 17–19]. Some of the possible complications described consist of temporary or permanent nerve injuries (V or VII cranial nerve), otic injuries (tympanic membrane perforation, hemotympanum, blood clots in the external auditory canal, laceration of external auditory canal, hearing loss, fullness of the ear), preauricular hematoma, superficial temporal artery aneurysm, arteriovenous fistula, transarticular perforation, intracranial perforation, extradural hematoma, parapharyngeal swelling, intraarticular problems (hemarthrosis, arthritis, bacterial infection), and intraarticular instrument breakdown. [2].

The complication rate of TMJ arthrocentesis has not yet been defined, but is considered to be less than arthroscopy [2, 3, 15]. Temporary facial paresis or paralysis caused by local anesthetics or swelling of the neighboring tissues is common after arthrocentesis. As recently reported by Al-Moraissi, other complications described for arthrocentesis are extradural hematoma, severe bradycardia, and cervicofacial oedema [16].

In the reported case, following the arthrocentesis, objective vertigo without auditory alterations or damage of the tympanic membrane was developed. The mechanism underlying this complication was unclear. Transarticular puncture of the thin temporal fossa floor has been described [15]. In a similar way, it could be possible that the needle penetrated the temporal bone releasing the anesthetic solution near the semicircular canals in the inner ear. Alternatively, high-pressure irrigation of the TMJ cavity might have caused some fluid to pass through the joint capsule and be adsorbed by the fine channels in the bone, reaching vestibular structures. The absence of auditory disorders and middle ear abnormalities makes the passage of the anesthetic improbable through the foramen of Huschke. TMJ proprioception receptor overstimulation can be another effective etiologic hypothesis.

However, TMJ arthrocentesis remains a procedure with a minimal number of important complications. Its safety is closely related to the surgeon's experience and seems not increased by imaging techniques such as the use of ultrasonic guidance [20]. Generally, when present, complications are temporary, due to the anesthethic effect or washing pressure of injection, and can generally be managed on an outpatient basis. Even if arthrocentesis is a minimally invasive procedure, great attention should be paid to avoiding vascular and nerve injury and respect the thin bony lamina that separates the upper joint space from the above neurocranial structures. Infringement of these structures can lead to major complications requiring immediate hospitalization for monitoring and to establish an appropriate therapy.

Conflict of interest The authors declare that they have no conflict of interest.

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