

Case Report

Arthrocentesis as an Adjuvant Therapy for Conservative Treatment of Mandibular Condylar Trauma: Case Report

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Introduction

The mandibular condyle is a vulnerable anatomical structure and is involved in 20% to 31.5% of all mandibular fractures [1,2]. Fractures of the mandibular condyle are commonly indirect and caused by energy converging from a distant mandibular region to the Temporomandibular Joint (TMJ) [3]. Clinical signs of condylar fracture include pain, pre-auricular edema, otorrhagia, malocclusion, limitation of mouth opening, and deviation to the affected side during mouth opening [4-7].

Medical imaging modalities, such as transcranial radiography for TMJ disorders, panoramic radiography, and Computed Tomography (CT), have been used for diagnosing condylar fractures. For intracapsular evaluation of the soft tissues and joint morphology, Magnetic Resonance Imaging (MRI) and arthroscopy are the most accurate diagnostic methods [8-11].

The use of open versus closed treatment for condylar fractures is still controversial [7,12]. As a component of the TMJ, regardless of diagnosis or approach, an injured mandibular condyle will require intensive post-trauma rehabilitation, including careful observation, a soft diet, Maxillomandibular Fixation (MMF) with wires or elastics, and intense physiotherapy to restore the function of mouth opening [13,14].

Functional recovery is usually a slow and painful process, [14,15] due to hemarthrosis, synovitis, disc displacement, adhesions, and distortion of the upper joint space [13,16-21]. Clinical studies have highlighted the benefits of joint lavage as a component of conservative treatment, specifically in intracapsular and high subcondylar fractures, since it offers a less invasive and less painful treatment [13,14,19]. This paper presents the case of a 56-year-old man, who

Abstract

The mandibular condyle fracture may occur with soft tissue injury of the Temporomandibular Joint (TMJ), resulting in hemarthrosis, joint effusion and disc displacement. Although arthrocentesis promotes improvement of the joint microenvironment by flushing the inflammatory mediators, its use is not common in mandibular condyle fractures. This paper aimed to report the case of a 56-year-old man with bilateral diacapitular mandibular condyle fracture, who was successfully treated by adjuvant arthrocentesis within the conservative treatment. The results indicated that arthrocentesis is a less invasive technique for conservative treatment of diacapitular mandibular fractures, reducing pain and improving mouth opening at the early stage of the treatment.

Keywords: Condylar head; Diacapitular fractures; Intracapsular; Mandibular fractures; Pain; Temporomandibular joint

was successfully treated using an adjuvant arthrocentesis procedure for conservative treatment of a fresh bilateral diacapitular condylar fracture.

Case Report

A 56-year-old man was referred to the Oral and Maxillofacial Surgery Department of the Emergency Hospital of Goiânia (Hospital de Urgências de Goiânia - HUGO/SES-GO, Goiânia, Brazil). The patient fell from his height during an epileptic seizure and hit his chin. The patient presented with otorrhagia and pre-auricular edema on the right side, mandibular deviation to the right during mouth opening, a 25-mm maximum mouth opening, and bilateral pain on palpation of the TMJ, with a visual analogue scale (VAS) score of 10 for pain (Figure 1). No dental occlusion alterations were evident. A CT scan revealed a bilateral diacapitular condylar fracture according to Neff et al. classification, [22] and a bilateral TMJ effusion was confirmed using MRI (Figure 2). Conservative treatment of the condylar trauma, with adjuvant bilateral arthrocentesis of the TMJ, was performed. Under general anesthesia, the arthrocentesis was performed, as described by Nitzan, [23] to remove intra-articular inflammatory components, improve the micro-environment, decrease pain, and enhance mouth opening (Figure 3). In the immediate postoperative period, the patient was instructed to perform intense exercises for mouth opening and eat only a soft diet. The VAS score for pain, interincisal aperture, and excursion movements were examined during the 4 months of follow-up.

At the first follow-up, 7 days after the procedure, the patient exhibited a 45-mm interincisal aperture and a VAS score of 2. At the 1-month follow-up, the aperture was 53 mm, and the VAS score was 0. The patient was also able to perform lateral movements and

protrusion without difficulty, and occlusion was maintained, without mandibular deviation (Figure 4). At the 4-month follow-up, the patient remained pain-free, with a restored mandibular excursion and mouth opening of 64 mm.

Discussion

As a component of the TMJ, an injured mandibular condyle requires intensive post-trauma rehabilitation for soft tissue healing and bone remodeling, in order to achieve stable dental occlusion and maintain the position of the mandible in the TMJ [24]. However, we recognize that functional rehabilitation is a slow and painful process [14,15]. Depending on patient compliance, pain may be the major reason for a patient's noncompliance with treatment.

The functional recovery and the severity of pain seem to be related to the injured soft tissues of the TMJ. Recent studies have highlighted the role of the TMJ soft tissue components in mandibular traumas [16-21]. Hemarthrosis, identified on MRI as joint effusion, is the first and main event involving the soft tissues of the TMJ that occurs with condylar fractures [11,20,25]. Clinically, hemarthrosis causes pain, edema, and limitation of mouth opening [20]. In addition, effusion has been shown to be related to inflammatory mediators, bone resorption, synovitis, disc displacement, adhesions, and distortion of the upper joint space, with relevant clinical repercussions [16-21].

The soft tissue changes of the TMJ are also proportional to the severity of the fracture [9]. However, a study reported greater injury to the TMJ with intact mandibular condyles compared to that of fractured condyles [10]. Another recent study reported that aggressive surgeries were required in non-fractured condyles cases, due to late temporomandibular disorder complications [26]. Therefore, it is important to identify and quantify the status of soft tissues of the TMJ in mandibular trauma.

The efficacy of arthrocentesis in the treatment of temporomandibular disorders has been well documented in the literature. Arthrocentesis is a less invasive technique that promotes improvement of the joint microenvironment by flushing the inflammatory mediators responsible for pain and bone resorption, promoting the production of healthy synovial fluid, and removing secondary inflammatory components [15,23].

In cases of mandibular condylar fractures, clinical studies have reported that a significant improvement of pain scores and mouth opening in the first 3 months of treatment was obtained in the joint lavage group when compared to those of the conventional conservative treatment group [13,14]. In the present case, we found similar results, with significant improvement of the pain score and mouth opening in the first 30 days after arthrocentesis. This improvement was essential for the early establishment of adequate physiotherapy to restore mandibular movement. The fast reduction in pain contributed positively to the patient's adherence to physiotherapy at the most critical period of the treatment.

Although arthroscopy of acute TMJ trauma can identify additional signs, such as capsule hyperemia, hemarthrosis, hemosiderin, synovial ecchymosis, hematomas along the joint walls, [10,11] synovitis, and deterioration of the disc and temporal surfaces, it has limited cost-effectiveness for public health in Brazil. Due to the unavailability of arthroscopy in our hospital, we consider arthrocentesis as a valid tool,

since it is minimally invasive and has a good cost-benefit ratio [14,15].

Furthermore, we agree with Nogami et al. [21] that joint lavage presents beneficial results for patients with acute TMJ trauma, but more studies and clinical trials are needed, since there is a lack of literature on this topic [25]. Despite advances in diagnostic techniques, [20] the effects of mandibular trauma on the soft tissue components of the TMJ are still poorly understood, [18] and soft tissue injury is underdiagnosed.

Conclusion

In conclusion, damage to the soft tissue plays an important role in acute TMJ trauma. Arthrocentesis is a safe and minimally invasive adjuvant procedure for conservative treatment of mandibular condylar trauma. However, more studies are needed to compare its effectiveness with that of traditional modalities of treatment.

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Competing Interests

The authors declare that they have no conflict of interest.

Ethics Approval

All procedures performed in this case report involving human participant were in accordance with the ethical standards of the institutional and the national research committee.

The patient provided informed consent.

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