

# CHIROPRACTIC AND ORAL SURGICAL CO-MANAGEMENT OF ACUTE ANTERIOR TEMPOROMANDIBULAR DISC DISPLACEMENT WITHOUT REDUCTION DUE TO SPORTS-RELATED TRAUMA IN A PEDIATRIC PATIENT – A CASE STUDY AND REVIEW OF THE LITERATURE

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## ABSTRACT

**Objective:** To discuss a pediatric patient with acute temporomandibular disorder due to a sports-related trauma requiring chiropractic and oral surgical co-management.

**Clinical Features:** A 12-year-old girl sought chiropractic care for temporomandibular joint dysfunction (TMD) resulting from a volleyball injury after referral from her oral surgeon. Severe trismus was seen, along with spasm of the masticatory muscles and evidence of joint effusion. Mouth opening was significantly restricted and painful limiting her diet, ability to sing, smile, yawn and brush her teeth. Though not complaining specifically of neck pain, findings consistent with upper-crossed syndrome were present along with indicators of vertebral subluxation. Cervical ROM was limited and in some planes aggravated her TMJ pain.

**Intervention and Outcome:** Treatment consisted of chiropractic adjustments to the cervical and thoracic spine using Diversified Technique along with instrument-assisted soft-tissue mobilization directed to the musculature of her cervical and thoracic regions and muscles of mastication. Therapeutic exercises were attempted. TENS and low-level laser was also administered to reduce TMJ pain. Improvement in pain, TMJ ROM, CROM along with reduced indicators for vertebral subluxation were initially reported; however,

her progress plateaued leading to advanced imaging and subsequent surgical intervention.

**Conclusion:** This young athlete ultimately required treatment by an oral and maxillofacial surgeon. Her condition resolved only after TMJ arthrocentesis with manipulation of the mandible under anesthesia. Clinicians treating TMJ disorders should be aware of its various origins, treatment options and complications and be willing to consult with or refer to the appropriate specialist when needed. This case provides an argument for interdisciplinary collaboration for some temporomandibular joint disorders. (*J Contemporary Chiropr* 2021;4:26-34)

**Key Indexing Terms:** Chiropractic; Temporomandibular Joint (TMJ); Temporomandibular Disorders (TMD); Adolescent; Closed Lock; Anterior Disc Displacement; Maxillofacial Surgery

## INTRODUCTION

Temporomandibular Disorder (TMD) is a group of symptoms that may include pain or tenderness in the temporomandibular joint or surrounding muscles, headache, earache, neck, back, or shoulder pain, limited jaw movement, or a clicking or popping sound in the jaw that are caused either by dysfunction of the temporomandibular joint (as derangement of the articular disk) or another problem (such as spasm or tension of the masticatory muscles) affecting the region of the temporomandibular joint. (1)

Though there appears to be a lack of research in the existing literature regarding the prevalence and cost

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of such disorders, studies suggest that TMD is second only to low back pain among musculoskeletal disorders resulting in pain and disability. (2) TMD affects more than 10 million Americans (studies suggest between 5% and 25% of the population). (2-7) TMD is common in the pediatric population, too, with an estimated 1 in 6 children and adolescents demonstrating signs of TMJ disorders. (8, 9) TMD is associated with an annual cost estimated at \$4 billion according to data from the National Institute of Dental and Craniofacial Research, at the National Institutes of Health (NIH). (2) Fricton *et al*, however, estimate that the annual cost for treating chronic craniomandibular pain is \$32 billion. (10) Brotman found that managed care treatment costs for TMD ranged from \$12,000 to \$20,000 annually per patient. (11) Moreover, studies have found that patients with TMD have significantly higher rates of utilization of health care services than do patients without TMD. (3) The high cost of that treatment may be directly related to the unresponsiveness of TMD to traditional medical management. (6) Consequently, some patients may seek complementary and alternative medicine (CAM) approaches to manage their TMD-related pain.

Chronic TMD can be costly. Vinjamury *et al* reported that an estimated \$30 billion worth of productivity and more than 550 million work days are lost each year due to TMD. (5) For this reason, cost-effective early intervention is necessary not only to reduce TMD-related costs, but to reduce suffering in patients with TMD. Studies of patients with TMD show that their social, vocational and emotional lives are affected as a result; if TMD progresses to a chronic condition, it can become seriously debilitating and disruptive to everyday life. (3)

Multiple traditional treatment options exist for TMD patients, including medication, intraoral appliances, injections, surgery, and physical therapy. No single treatment method, though, has been widely accepted as the treatment of choice. (6) This is likely due to the varied clinical manifestations of TMD along with the lack of studies on treatment. In their systematic review of the prevalence and treatment of TMD in children and adolescents, Christidis *et al* found only 2 articles on treatment of adolescents and therefore concluded that it is not possible to achieve any evidence-based treatment guidelines for that population with TMD because of the general absence of research. (8) Because of the variety of TMD symptoms, patients are apt to consult with multiple provider types like dentists, neurologists, otolaryngologists, psychiatrists and other specialists. It is clear, too, that the use of complementary and alternative medicine (CAM) for TMD is steadily growing and seems to be preferred over invasive conventional care. Acupuncture, chiropractic, and massage were most frequently accessed and reported as helpful by participants in a study conducted by the Oregon Center for

Complementary and Alternative Medicine. (5) Raphael *et al* reported that 22% of the women in their survey with myofascial TMD used CAM, including chiropractic, for their pain. That survey also noted that medication was the only single type of treatment more commonly used than CAM. (12) In still another study, two-thirds of patients reported using CAM services for their TMD. (13) In 2005, the National Board of Chiropractic Examiners (NBCE) conducted a survey of 2,574 chiropractors in the U.S., which confirmed TMJ pain is a condition that is commonly seen by chiropractors (their data rated TMD complaints as being a condition that 'sometimes' (26-50%) presents to a chiropractor's office). (7) In determining treatment options for TMD, practitioners must take into consideration its varied presentations.

Temporomandibular disorders fall into 3 main categories according to the National Institute of Dental and Craniofacial Research. A person may be afflicted with 1 or more of these conditions at the same time. The most common, myofascial pain, involves discomfort or pain in the muscles that control jaw function. Another cause is arthritis, which refers to a group of degenerative/inflammatory joint disorders that can affect the temporomandibular joint. Lastly is internal derangement of the joint involving a displaced disc, dislocated jaw, or injury to the condyle. (14) For the TMJ, the most common internal derangement is displacement of the disc. Usually the disc displaces in an anterior, anterolateral, or anteromedial direction meaning that the posterior band of the disc prolapses anteriorly, relative to the superior surface of the condyle, instead of remaining in position between the condyle and mandibular fossa. (15)

Anterior disc displacement (ADD) may be further categorized into displacement with reduction (repositioning of the disc to its normal position on mouth opening, often associated with clicking) and ADD without reduction, i.e., closed lock (without repositioning of the disc to its normal orientation upon mouth opening, associated with limited jaw opening due to the disc mechanically obstructing translation of the mandibular condyle). (16) Though disc displacement has been found in both symptomatic and asymptomatic patients, the incidence is much higher in those with TMJ pain. Furthermore, pain is significantly more likely in those with ADD w/o reduction. (17) The most common TMD-related diagnoses in the pediatric population are myofascial pain and ADD with reduction. (8)

TMD secondary to internal derangements of the joint are common. Disc displacement can be caused by repetitive, micro-trauma or acute trauma. There appears to be an abundance of literature on chronic TMD caused by micro-trauma, but little on acute, traumatic disc displacement (ATDD) without reduction. After acute trauma to the jaw, clinicians are typically more concerned with ruling

out fracture and may fail to give further consideration to those cases of TMJ pain without fracture, especially since disc displacement cannot be detected on CT or plain-film imaging. Also lacking are long-term follow-up studies on ATDD without reduction. As a result, acute traumatic TMJ disc displacement and its sequelae are not familiar to most clinicians. Although conservative treatment for anterior disc displacement without reduction shows good results, the prognosis may differ in TMD resulting from acute traumatic insult. (18)

Given the scarcity of literature describing management protocols for TMD, especially in the pediatric population as well as for cases arising from acute trauma, the purpose of this paper is to discuss a case of acute anterior temporomandibular disc displacement without reduction due to trauma in an adolescent who underwent chiropractic and oral surgical co-management.

## CASE REPORT

### History

The patient, a 12-year-old female, came 1 week post injury after referral from her oral surgeon. She was struck in the area of the right jaw by a volleyball during a match and experienced an immediate onset of pain over the area of impact as well as in the region of the left TMJ. Given her significant pain and difficulty with attempting to open her mouth, she was taken the next morning to her dentist where a panoramic dental x-ray was obtained. Mandibular fracture could not be definitively ruled out resulting in a referral to a local, hospital-based dental clinic for oral surgical consultation. There, a CT scan was performed and reported as negative for fracture. She was prescribed ibuprofen and physical therapy for TMD (temporomandibular joint disorder) by her oral surgeon.

Her left TMJ pain remained persistent while her right jaw pain (likely due to contusion) resolved. She continued to experience significant difficulty and pain over the left TMJ when attempting to open her mouth. She had been unable to eat solid foods since her injury. She noted difficulty smiling, yawning, brushing her teeth and sleeping with pain over the left preauricular area. She enjoys singing and was unable to continue with voice lessons due to her injury. She also stated that she "[felt] a bump over her left jaw" (while pointing to the left preauricular area). She noted occasional neck pain and a history of frequent headaches, which had not changed in intensity or frequency since the injury. She was taking ibuprofen PRN and using warm compresses over the jaw, which provided minimal and temporary relief. Her left TMJ pain was reported to be a constant, dull ache, which became sharp with movement of the jaw. She denied any changes to facial sensation or salivation. She rated her

pain 8/10. Immediately following the injury, her pain was 10/10.

### Examination

Severe trismus was noted as she spoke through clenched teeth and had significantly restricted mouth opening. No facial bruising was evident. Assessment of cranial nerves V and VII were normal. Palpation over the left TMJ revealed a bulge suggestive of joint effusion. She also noted severe tenderness upon palpation over her left TMJ. Severe muscle hypertonicity and spasm was noted of the left masseter and to a lesser degree of the right masseter. Mild tenderness was noted over the right TMJ. No significant tenderness or spasm was noted for the temporalis muscles bilaterally.

Active opening of the mouth was significantly restricted and painful. Maximal incisal opening (MIO) was <20mm with guarding (the patient was barely able to fit the width of her index finger in between her teeth). Full translation of the mandible was not achieved. She was able to clench her teeth. Active protrusion appeared limited. Active left deviation was minimal and painful. Right mandibular deviation was limited and was less painful. Resisted ROM upon closing the jaw reveals good strength (masseter, temporalis, medial pterygoid) but was painful suggesting irritation of the muscles involved; resisted isometric opening reveals good strength (digastric, lateral pterygoid) as did right deviation; resisted left deviation produced pain over the left jaw. There was no evidence of crepitus.

Chiropractic examination included a battery of commonly used tests. (19) Postural examination revealed anterior head carriage, right head tilt and a high left shoulder. Static palpation elicited pain throughout the cervical and upper thoracic spine with taut and tender fibers of the paravertebral musculature noted. Trigger Points were present in the suboccipital region, upper trapezius and levator scapulae both right and left. These findings are suggestive of Upper-Crossed Syndrome. (20) Restriction of the upper cervical vertebrae (C1, C2) and thoracic vertebrae (T2-5) was found upon motion palpation. Examination also revealed cervical syndrome (fast) indicating a C1 subluxation. Active cervical ROM is slightly limited globally, primarily upon right rotation and left lateral bending, which aggravated her left TMJ pain. Orthopedic evaluation: Cervical Spine Compression Test was negative; Cervical Distraction Test improved localized neck pain; Shoulder Depression Test on the right was negative; Shoulder Depression Test on the left increased pain throughout the left jaw.

### Intervention and Outcomes

Chiropractic care was initially provided for 12 visits over a 4-week period. She received specific chiropractic adjustments using Diversified Technique (contact-specific, high-velocity, low-amplitude) to correct vertebral subluxations throughout the cervical and thoracic spine on each visit. In addition to chiropractic adjustments, she was treated with instrument-assisted soft-tissue mobilization (IASTM) utilizing the RockBlades® Mowhawk IASTM system and emollient by RockTape® (2001 TW Alexander Drive, Durham, NC 27709) directed to the muscles of the cervical and thoracic spine to address identified hypertonicity and trigger points as well as to the muscles of mastication, primarily the masseters, to address hypertonicity, trismus and associated myofascial pain. (21-23) Transcutaneous electrical nerve stimulation (TENS) and low-level laser was also administered to reduce TMJ pain. (24-26) Therapeutic exercises were performed to address apparent upper-crossed syndrome. (20, 27) Jaw exercises were attempted to address her limited MIO; however, these were not tolerated and therefore discontinued. Chiropractic manipulation of the TMJ was also considered, though not performed due to the severe tenderness that persisted.

She reported slow but steady improvement in pain throughout her initial phase of treatment. Re-evaluation occurred on the 7th visit after two weeks of care at which time she rated her left TMJ pain 4/10 at rest and 7/10 attempting to open her mouth. Her diet remained restricted to soup and soft foods. Mouth opening, though still significantly restricted, was somewhat improved. She was able to “fit nearly the width of 2 fingers between her teeth.” MIO was approximately 25-30 mm. Severe tenderness upon palpation over the left TMJ persisted. Spasm of the left masseter was reduced with only slight hypertonicity present. Postural examination on this visit revealed high left shoulder and anterior head carriage. Global CROM was WNL. None of the previously identified trigger points were present. Motion restrictions of C1-2 and T3-5 were found. Shoulder Depression test no longer resulted in pain over the left jaw. These findings also represented a reduction in indicators for vertebral subluxation since the initial visit. Upon informing the patient’s oral surgeon of these results, the decision to continue with chiropractic management was made.

Re-examination again took place on the 12th and final visit. She rated her left TMJ pain as a 2/10 at rest and 7/10 upon opening her mouth. Her diet remained restricted. No significant spasm was noted over the masticatory muscles. No further improvement was noted in MIO, which remained restricted to 30 mm. This suggested improvement in the myofascial component of the patient’s TMD, though an articular component persisted. Postural evaluation revealed reduced anterior head carriage and

Table 1. MIO by age

Age (Years)	Mean MIO (mm)
4-5	41.34
6-7	43.52
8-9	47.77
10-11	50.2
12-13	51.27
14-15	51.73

high left shoulder. CROM was normal. Some restriction was found at C1-2 and T3-4 upon motion palpation. Chiropractic examination was negative for cervical syndrome. These findings represented a further decrease in the indicators for vertebral subluxation.

At my request, she followed-up with her oral surgeon the next day. MRI of the TMJ was ordered given the patient’s persistent trismus, tenderness over the left TMJ and functional limitations despite her recent course of conservative care. MRI revealed anterior temporomandibular disc displacement bilaterally without reduction. Bilateral TMJ arthrocentesis and manipulation of the mandible under anesthesia was recommended and later performed without complication by an oral-maxillofacial surgeon in a hospital-based operating room setting. Following surgery, she was given an appliance, the TheraBite® Jaw Motion Rehabilitation System™ (Atos Medical, Hörby, Sweden) and instructed on its use. This device, along with a course of chiropractic management, was recommended post-operatively to prevent adhesions and to work toward full mandibular ROM. Chiropractic care at this point consisted of therapeutic exercises, myofascial release techniques and chiropractic adjustments.

She was re-examined by both me and her oral surgeon 2 weeks status post bilateral TMJ arthrocentesis and MUA. She admitted that she only used the prescribed oral appliance on several occasions since she felt her ROM was normal. She had no pain or swelling. She was again taking singing lessons and was also able to resume a normal diet, mentioning that she enjoyed a steak salad. Examination revealed no tenderness over the TMJ bilaterally. Cranial nerves V and VII were intact. MIO measured 45mm. (Table 1 includes mean MIO values as recorded by Kumari *et al* (28) in their study to establish the normal range of maximal incisal opening in the pediatric population.) Since the patient’s goals of reducing pain, restoring normal ROM and function to pre-injury status were achieved, no further treatment was recommended.

## DISCUSSION

This report outlines a case in which an adolescent suffered an acute, traumatic onset of anterior TMJ disc displacement resulting in closed lock. It is often recommended that such conditions be treated with manual manipulation and other supportive therapies such as TENS, jaw exercises, occlusal splints, diet modifications and medications such as NSAIDs, muscle relaxers and even opioids and tricyclic antidepressants. (29, 30) A review of the literature regarding the efficacy of some of these treatments follows.

Literature suggests, along with clinical experience, that chiropractic management of TMD is often effective. (5-7,31) In their prospective case series on the effects of chiropractic treatment of TMD using the Activator Methods® technique, DeVocht *et al* reported improvement of pain and a median increase in MIO of 9mm in their nine participants. (6) Their study attempted to include only TMD of an articular nature. Patients in this study also suffered from symptoms of TMD for at least 6 months, which suggests chronicity. This is reflective of much of the available research as little focuses on acute TMD. Further, unlike DeVocht's paper, many reports of improvement in TMD patients undergoing chiropractic management fail to address the specific etiology of the TMD or criteria for patient selection nor do they address specific adjusting protocols, details of performed therapeutic exercises, parameters of modalities used, etc.

There are models proposing that TMD is associated with imbalance of the whole body. In his argument for dentists and chiropractors to work together in the treatment of the TMJ, Blum writes, "The body functions as a closed kinematic chain, and effecting one part will have a cascade of effects throughout the musculoskeletal system from head to toe." (32) Walczyńska-Dragon *et al* stated, "These adaptive changes occur at all levels, within tolerance of the body. When the body's capacity to compensate for the pathological changes progressing in given areas is exceeded then imbalance occurs and pathological symptoms appear." In their study, involving 60 patients with TMD, cervical spine pain and limited ROM, 30 were treated only with a TMJ occlusal splint. Significant improvement in TMJ function, cervical ROM and spinal pain was noted as compared to the control group. They concluded there's a significant association between TMD treatment and reduction of cervical spine pain. (33) Silveira *et al* examined the correlation between jaw disability and neck disability using the Neck Disability Index (NDI) and the Limitations of Daily Functions in TMD Questionnaire (LDF-TMDQ) and found it was significantly high suggesting that one has an effect on the other. Presence of neck pain was shown to be associated with TMD 70% of the time. (34) Jaeger *et al*

presented a case in which complete resolution of jaw pain and clicking was achieved after the correction of a right lateral head translation posture utilizing CBP® technique mirror image® left sided exercises, and traction methods as well as spinal manipulative therapy (SMT). (35) Alacantha *et al* saw reduced TMD symptoms following chiropractic adjustments to correct atlas subluxation. (36) Examination of the patient in the case study presented here revealed increased TMJ pain upon cervical lateral flexion. Despite undergoing SMT and realizing a reduction in indicators for vertebral subluxation, the patient's TMD persisted. These findings suggest a strong link between posture, especially of the cervical spine, and emphasize the importance of considering the neck and its structures when evaluating and treating patients with TMD and vice versa, creating a case for co-management of patients between dentists and chiropractors.

Rubis *et al* outlines such a case of chiropractic – dental collaboration in their treatment of a TMD patient with evidence of disc displacement, tinnitus, headaches, neck and shoulder pain whose symptoms improved after 3 weeks of chiropractic and dental care. (37) Chinappi and Getzoff concluded that the position of the jaw, head and neck are intricately linked when their patient suffered an acute onset of TMJ pain along with neck and back pain after she sought orthodontic treatment with braces; proposing that these symptoms were caused by the inability of the head and neck to adapt to maxillary and mandibular changes. They argue that chiropractic treatments enabled the body to respond positively to the dental changes. (38)

Mandibular manipulation by both chiropractors and dental practitioners has been shown effective in anterior disc displacement without reduction specifically. Jagger reported a mean increase of 8mm in MIO after mandibular manipulation in 12 patients suffering from ADD w/o reduction for a mean duration of 3 months, all of whom experienced an immediate increase in ROM. (39) While investigating manipulation of the TMJ under general anesthesia, Foster *et al* observed that mouth opening increased from a median of 20mm prior to treatment to a median of 38mm post-manipulation in the 36 participants. (40) Saghafi and Curl found MIO returned to normal in addition to the abolition of TMJ pain and clicking in a 21 year-old woman with a 4 – year history of TMD due to an adhered anteriorly dislocated disc after chiropractic manipulation. (41)

He *et al* described the characteristics of acute, traumatic disc displacement of the TMJ without reduction: 1. facial trauma, especially in the chin area; 2. no TMJ pain, clicking, crepitus, mouth opening limitation and mandibular movement dysfunction before injury; 3. TMJ swelling, pain and mouth opening limitation after injury; 4. CT examination showing no condylar fracture

and 5. MRI examination showing an anteriorly displaced TMJ disc. (18) The patient in this case met these criteria.

Some studies propose that patients not responding adequately to conservative treatment are more susceptible to develop OA or even ankylosis. (16,18,42-45) Merrill used TMJ arthroscopy to check 1151 patients with internal derangement, 60% of whom had a history of mandibular trauma at least 1 year before. Although these patients had no condylar fracture, there was severe condylar surface bone destruction with an anteriorly displaced TMJ disc. (43) Lei *et al* evaluated the occurrence of degenerative TMJ changes in 300 adolescents and young adults with recent onset ADD w/o Reduction using high-resolution cone beam computed tomography (CBCT) and found condylar OA changes in 59.30% of the joints with ADD w/o reduction; prevalence of early-state OA increased from 24% to 60% just 1 month after TMJ closed lock occurred; OA changes were 5.33 times higher one month after onset of ADD w/o reduction. (44) In a similar study, Moncada *et al* reviewed MRI of 88 children and adolescents with TMD. A significant association was observed between disc displacement without reduction and degenerative bone changes. (45) Early diagnosis and intervention to reposition the disc may be vital in prevention of ankylosis in trauma-induced TMD. (16, 18, 42, 43)

As previously noted, the patient here was unable to tolerate suggested conservative measures such as jaw exercises and chiropractic manipulation of the TMJ. Some suggest that jaw exercises that aim to force open the mouth in closed lock presentations may only further aggravate the intracapsular tissues. (29) Some manipulative techniques, too, may pose a risk of compressive injury to the retrodiscal tissues and hemarthrosis. (31) Since the patient's acute persistent closed lock of the TMJ was refractory to more conservative measures in this case and given the patient's age, functional impairments and risk of long-term disability, arthrocentesis and manipulation of the TMJ under anesthesia was accepted as the next step in treatment.

TMJ arthrocentesis entails placing 2 needles into the joint space for purposes of lysis and lavage via hydraulic distension, which has been shown to be successful in treating various internal derangements, most commonly anterior disc displacement without reduction (closed lock) and disc adhesion. (15, 46) This procedure along with MUA aims to release the disc, eliminate inflamed synovial fluid and enable mobilization of the joint. (15) First described by Nitzan in 1991, the technique of TMJ arthrocentesis and lavage with manipulation has gained widespread acceptance. (15, 47)

It is not without risk and requires careful consideration. Though rare, complications of TMJ arthrocentesis include extravasation of fluid into surrounding tissue, facial nerve

injury, otic injury, preauricular hematoma, superficial temporal artery aneurysm, arteriovenous fistula, transarticular perforation, intracranial perforation, extradural hematoma, parapharyngeal swelling, and intra-articular problems. (15) The subject of this paper suffered temporary facial nerve paralysis –likely of the temporal branch – with symptoms of brow ptosis and an inability to elevate the eyebrow probably due to injected anesthetic, which resolved within a few hours post-operatively.

In summary, TMJ arthrocentesis with manipulation can be an effective alternative to more invasive surgical procedures for the treatment of acute persistent closed lock of the TMJ that is unresponsive to more conservative measures. (15,31,46,48-50) Providers facing similar presentations of TMD should be aware of this as an early treatment option as an attempt to prevent unnecessary, chronic sequelae.

#### Limitations

Limitations of this study include those inherent to a single case report. Results herein cannot be generalized. Larger prospective case series or, perhaps, randomized clinical trials should be conducted to explore the efficacy of different treatment protocols in various presentations of TMD.

## CONCLUSION

Temporomandibular joint disorders are common and can manifest in a variety of symptoms leading its sufferers to seek care from both traditional and alternative provider types. No single treatment has been identified as being superior. Chiropractic management alone of temporomandibular disorders has been shown effective by some studies. Research also suggests that chiropractic – dental collaboration may often be appropriate. This is a case of a 12-year-old patient who suffered an acute onset of TMD, more specifically, anterior disc displacement without reduction due to a sports-related trauma. It seemed at first that her condition was responding, albeit slowly, to chiropractic management; however, progress plateaued at an unacceptable level necessitating advanced imaging and subsequent surgical intervention. Her condition resolved only after TMJ arthrocentesis with manipulation of the mandible under anesthesia.

Although TMD presenting after acute injury may seem commonplace, literature suggests that acute, traumatic anterior disc displacement (ATDD) without reduction is not well understood and may lead to rapid and early osteoarthritis or ankylosis, therefore requiring early intervention. When treating patients with TMD, providers should be aware of the case-specific etiology, treatment options and sequelae and be willing to consult with or refer to the appropriate specialist in a timely manner. This case

provides an argument for interdisciplinary collaboration for some temporomandibular joint disorders. Given the prevalence of TMD and the significant individual, social and economic burden that is associated with it; further research is necessary to explore the benefits of specific treatment protocols in specific manifestations of TMD.

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