The twin block injection: an adjunctive clinical aid for the management of acute arthrogenous temporomandibular joint dysfunction

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**Background:** The twin block injection is a novel nerve block that has been shown previously to be efficacious in the management of masticatory myofascial pain. Little is known about its effectiveness for reducing pain from the temporomandibular joint (TMJ). **Case report:** A 19-year-old man presented with limited mouth opening with pain in the left side of his face. After a thorough history and examination was completed, the diagnosis was acute anterior disc displacement without reduction in the left TMJ and myalgia of the left side temporalis and masseter muscles. After receiving the twin block injection, the patient reported that the pain in his TMJ had reduced along with the concomitant myalgia. The twin block injection is efficacious for the management of both arthrogenous and myogenous sources of temporomandibular disorders. (Quintessence Int 2020;51:330–333; doi: 10.3290/j.qi.a44150)

**Key words:** myalgia, nerve blocks, temporomandibular disorder

The diagnostic criteria for temporomandibular disorders (DC/TMD) classify temporomandibular disorders (TMD) as either myogenous or arthrogenous in origin. The twin block injection is a novel nerve block technique, shown to be efficacious in reducing masticatory myofascial pain. The twin block is an extraoral nerve block in which a single injection anesthetizes both the masseteric and deep temporal nerves to reduce the nociceptive inputs from the masseter and temporalis muscles. A case is reported in which, in addition to reducing the pain input from the masseter and temporalis muscles, the patient reported that the pain in his temporomandibular joint (TMJ) had also resolved after receiving the twin block injection, making it a useful clinical aid to help patients with pain in their TMJ.

**Case presentation**

**Presenting concerns**

A 19-year-old man was referred to the Center for Temporomandibular Disorders and Orofacial Pain at the Rutgers School of Dental Medicine for the management of his chief complaint of limited mouth opening and pain in the left side of his face for the past week, which developed after chewing on nuts. He reported that while he was chewing on the nuts and heard a click, and immediately developed severe left-sided face pain and limited mouth opening.

**Clinical findings**

The medical history was not significant. He was taking over the counter ibuprofen 400 mg three times a day for the pain with limited relief.

The cranial nerve screening was essentially normal with the exception of pain on clenching in the left masseter muscle. Digital palpation of the left TMJ using the DC/TMD criteria, elicited severe pain in the region of the lateral and posterior aspects of the joint. He had mild tenderness on palpation of the right TMJ.

The DC/TMD criteria for digital muscle examination were adhered to during the evaluation of the masseter and temporalis muscles. Palpation of these muscles revealed severe ten-
An anterolateral tenderness in the left anterior and middle temporalis and masseter muscles and mild pain on the right side. The patient rated the pain on the left side as 8/10 and on the right as 2/10 on the visual analog scale.

Functional examination of the patient’s mandible revealed a restricted range of motion; 27 mm interincisally, with a deflection of the mandible toward the left side (Fig 1). The lateral excursion toward the right side was limited when compared to the excursion to the left side. Based on these clinical findings, and the history provided by the patient, a clinical diagnosis of acute anterior disc displacement without reduction of the left TMJ and myalgia of the left masseter and temporalis muscles was made.

Therapeutic intervention

The twin block injection was given to the left side of the face. The point of entry of the needle was in the temporal fossa, just superior to the zygomatic arch, and one carpule of 2% lidocaine with 1/100,000 epinephrine was delivered in the infratemporal fossa, medial to the infratemporal crest (Fig 2). The patient reported no discomfort or pain at the injection site following the administration of the twin block.

Outcome

After the injection, the patient reported complete pain relief in the temporalis and masseter muscles and the TMJ on the left side, with a 0/10 rating on the visual analog scale, even though the disc was still anteriorly dislocated and he was unable to open his mouth wide. Manual reduction of the displaced disc of the left TMJ was successfully performed without any pain, and the final range of motion measurement was 38 mm (Fig 3). He was given home care instructions, which included a soft diet and using warm compresses.

The patient was seen for follow-up 2 weeks later, at which time the left TMJ was clicking, indicating that he had an anterior disc displacement with reduction, but he was pain-free with an inter-incisal opening of 38 mm.

Discussion

Anatomically, the sensory innervation to the TMJ is via the auriculotemporal nerve, which primarily innervates the posteromedial and anterolateral aspects of the TMJ capsule. The anteromedial aspect of the capsule is innervated by branches coming from the masseteric nerve and deep temporal nerves,
both of which are branches of the V3 division of the trigeminal nerve (Fig 4).³

The twin nerve block anesthetizes both the masseteric and deep temporal nerves, which supply sensory innervation to the anteromedial aspects of the capsule of the TMJ as well as to the temporalis and masseter muscles. By blocking these nerves that transmit pain sensations from the TMJ and the associated temporalis and masseter muscles, the patient experiences less pain, allowing the clinician to perform manual reduction of the displaced disc if necessary, and allows the patient to function free of pain. The interesting aspect of this block is that the pain relief lasted for up to 2 weeks, which is much longer than the duration of anesthesia. This phenomenon should be studied more in detail as the mechanism of action enabling the twin block’s prolonged efficacy has not been elucidated.

One possible mechanism could be due to the interruption of the pain-contraction cycle in the muscle(s) being innervated by the masseteric and temporalis branches of the mandibular nerve, which carry both sensory and motor innervation. Thus, the twin block provides sustained pain relief that could outlast the shorter relief provided by the local anesthetic. At this time, consistent with the clinical standard of care in the dental field, patient responses are used to evaluate profoundness and efficacy of local anesthetics administered, was well as assessment of pain relief following administration of the twin block. Peripheral nerve blocks are successfully used in the context of TMJ, shoulder, elbow, and knee joint pain, as well as abdominal surgery.⁹ Hence, this approach can be expected to be applicable to the management of myogenous face pain of masseteric/temporalis origin.

The twin block has been in routine use in multiple clinical settings, for the management of both acute and chronic myogenous pain. This includes acute myogenous pain secondary to protracted mouth opening during long dental appointments, and chronic myofascial pain of the masseter and temporalis muscles. To date, there have been no reported adverse outcomes from this block.

Practical implications

The twin block is a novel nerve block that is applicable in various clinical scenarios.⁸ In a study performed at the Center for Temporomandibular Disorders and Orofacial Pain at the Rutgers School of Dental Medicine, the effect of the twin block was compared to the trigger point injections of the masseter and temporalis muscles. For masticatory myofascial pain, the twin block was found to be just as efficacious as the trigger point injection, for up to 6 months.⁹

Based on the present clinical observation, it is proposed that the reduction of arthrogenous pain via the twin nerve block may be due to the reduction of pain sensations in both the masseter and temporalis muscles as well as in the TMJ.
The twin block presents multiple advantages over other modalities such as trigger point injections:

- Odontogenic pain can refer to the elevator muscles, since the innervation of the teeth and the elevator muscles are from different branches of the trigeminal nerve, the twin block is useful to differentiate between odontogenic and myogenous pain of masseteric/temporalis muscle origin.
- Similarity of the twin block, in principle, to the inferior alveolar nerve block (extraoral approach of the twin block necessitates skin disinfection).
- In a patient with significant medical conditions, a regional nerve block will be safer to provide pain relief for TMJ dislocations/closed locks.
- A general dental practitioner will be able to diagnose and manage myogenous pain of the masseter or temporalis muscles.

The single injection targets both the temporalis and masseter muscles. Hence, it is less invasive.

Safety of the technique and simple armamentarium lends itself to easy implementation.

It could potentially address access to care issues for patients.

Conclusion

In conclusion, the twin block is a useful therapeutic adjunct for the management of acute TMJ arthralgia accompanied by myogenous pain of masticatory muscle origin.

Declaration

The authors of this paper have no conflicts of interest.

References


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