

Original Research

Temporomandibular joint arthrocentesis using Single puncture double needle technique

Vikash Sharma, Abhilasha Yadav, Anuj Thakur, Shirish Dubey, Khalid Abdul Hafiz, Liza Mohanty

Dept of Oral and Maxillofacial surgery, Awadh dental college, Jamshedpur, India

ABSTRACT:

Introduction: Arthrocentesis is a method of irrigating the temporomandibular joint (TMJ) with a therapeutic substance. It is usually performed by dual puncture with two needles to the joint space. Several studies have shown that arthrocentesis of the upper compartment of the TMJ may be a highly effective method to restore normal maximal mouth opening and functioning. Nonetheless, the classical two needle technique has some limitations, such as the low tolerability and difficulty in performing it in the presence of intra-articular adhesions. The adoption of a single puncture technique for both fluid injection and aspiration might have some advantages with respect to the traditional two needle approach in terms of time of execution, tolerability, and retention of medication. **Materials and Methods:** A single puncture technique with a self fabricated device is used to assess the efficacy of this device. This study involved 20 patients of age ranging between 20- 64 years diagnosed with TMD. Patients follow up done at 3rd, 14th, 45th and 90th day and assessment of pain, mouth opening, clicking and deviation done with comparison of pre and post-operative data. **Results:** The procedure was successful in all the patients. Most of the patients reported reduction in pain more than half of the previous value and two patients reported only moderate reduction. There was a clinically significant improvement in mouth opening, clicking and deviation. **Conclusion:** Arthrocentesis is effective in treating TMJ internal derangement and restoring its function. Single puncture arthrocentesis, is a minimally invasive, simple, inexpensive & highly efficient procedure that can be performed under local anaesthesia.

Received: 20 June, 2018

Revised: 12 July, 2019

Accepted: 15 July, 2019

Corresponding Author: Dr. Vikash Sharma, Dept of Oral and Maxillofacial Surgery, Awadh Dental College, Jamshedpur, India

This article may be cited as: Sharma V, Yadav A, Thakur A, Dubey S, Hafiz KA, Mohanty L. Temporomandibular joint arthrocentesis using Single puncture double needle technique. Int J Res Health Allied Sci 2019;5(5):7-9.

INTRODUCTION:

Arthrocentesis of the temporomandibular joint was introduced in 1991 by Nitzan et al¹ and has since gained widespread popularity among practitioners who treat temporomandibular joint disorders. It is considered by many as the first-line surgical treatment for patients who do not respond to conservative treatment (physical therapy, occlusal splint therapy, pain medication, and lifestyle and behavioral changes). It is regarded as a minimally invasive procedure and is easily performed in an office setting. It allows lavage of the joint space and lysis of adhesions via hydraulic distension.

The traditional procedure uses 2 needles inserted through 2 separate puncture sites. These 2 needles must triangulate and be exactly placed in the upper joint space for the procedure to be efficient. One of the needles serves for the

inflow of the lavage solution and the second as the outflow. It is recognized that the procedure can be sometimes very challenging. The blind insertion of the second (outflow) needle can sometimes be difficult. Multiple punctures through the temporomandibular joint capsule are often necessary, which often leads to extra-articular leak of the lavage solution and decreases the intra-articular pressure required for lysis of the adhesions.

We have developed a new device where two 18-gauge needles 1.5 inches long are each bent 30 degrees toward their respective opening and shouldered together in a Y fashion with the openings facing outward (Figs 1). This is fabricated in our dental college using shoulder wire melted over two bent needles. The dual-needle device is packaged separately and sterilized. It is intended for a single use and is therefore disposable. We have been using the dual-needle

device since 2016. All our arthrocenteses have since been performed using only 1 single puncture to insert both needles together. No complication has been encountered using this technique in over 200 cases. The purpose of this article is to introduce the dualneedle device and describe in detail our technique. We propose the term “single-puncture arthrocentesis” (SPA) that well describes the procedure.

Figure1: Two needles bent and shouldered together



Surgical Technique

The patient is given an oral sedative (lorazepam 1 mg) 1 hour before the procedure. Arthrocentesis is always carried out at the clinic. The patient is placed in a semiseated position. A cotton pledget is placed in the auditory meatus to protect the ear from the irrigation fluid. Disinfection of the preauricular area is done with an antiseptic swab] (chlorhexidine 2%/alcohol70%). Local anesthesia is performed using 4%articaine with 1/200,000 adrenaline. We inject thesolution subcutaneously at the area of puncture andthen we direct the needle anteriorly and superiorly down to the zygomatic arch. We inject more of the solution in this region and around the temporomandibularjoint capsule. After that, we penetrate the upper compartment of the joint and distend it with 2 mL of the same anesthetic solution. The injections are done very slowly to minimize discomfort. We allow at least 15 minutes for the medication to take effect. We then precisely locate the site of our puncture.It is basically the same site as the first puncture in any arthrocentesis or arthroscopic procedure. Starting at the midpoint of the tragus, and following the tragal-canthal line (Holmlund line),² it is located 1cm anterior and 2 mm inferior to the line. After thepercutaneous puncture, the dual-needle device is directed anteriorly and superiorly until contact is made with the zygomatic arch. Keeping close contactwith the bone in this area, we slide both needlesin the upper compartment (which is distendedby the anesthetic solution). We ask the patient toopen the mouth and to shift the mandible to theopposite side to facilitate entry into the joint space.Once inside the joint space, we attach 1 of theneedles to an intravenous line hooked to a 500-mLlactate ringer bag (Fig 2).

Figure 2: Arthrocentesis performed using single puncture double needle technique.



Hydraulic pressure is obtained by inflating a tourniquet (300 mm Hg) around the bag. Next we flush 300 mL of lactate Ringer solution under pressure in the upper compartment.The dual-needle device needs to be manipulatedto have an optimum inflow and outflowof solution. Sometimes it must be pushed deeper orpulled back a little and sometimes the device has tobe rotated on itself or angled a little bit more. During the lavage, we ask the patient to mobilize as much as possible the mandible and we passively manipulate the joint to aid in the release of adhesions. At the end of the procedure, we detach the intravenous tubing and 1 ml of methyl prednisolone (40 mg/mL) is injected in the joint space through 1 of the needles while occluding the other with a finger. Then the device is completely withdrawn. A small Elastoplast covers the puncture site. The patient is discharged when stable, usually 30 minutes after the procedure.

DISCUSSION

Two reports in the literature have described a technique similar to ours. Alkan and Bas³ reported only 1 clinical case where they successfully used a double needle cannula to perform the procedure. Rehman and Hall⁴ suggested using a Shepard cannula to perform the procedure. The cannula has indeed the same configuration as our device but might not be available in every country. However, the investigators did not describe their technique in detail and called the procedure “single-needle arthrocentesis,” although it is evident that there are 2 needles in the cannula. The device we propose can easily be manufactured in any dental setup. SPA using the dual-needle presented in this report is a fast and easy-to-perform procedure that should be considered when patients with temporomandibular joint disorders show no improvement after conservative treatment. SPA is a safe and minimally invasive procedure. It presents some advantages over the classic arthrocentesis technique: only 1 puncture is required for the procedure and there are more chancesto have both needles in the same upper joint spacewith this technique. Clinically, we have not noticed a decrease in the efficiency of arthrocentesis since we

adopted the SPA technique and, as mentioned, we have used it in more than 200 cases since 2016. Obviously, more studies evaluating the true benefits of this procedure and comparing it with the traditional technique are needed and we currently have a prospective single-blind study under way. We encourage others who use similar devices to also publish their results.

REFERENCES

1. Nitzan DW, Dolwick MF, Martinez GA: Temporomandibular joint arthrocentesis: A simplified treatment for severe limitation of mouth opening. *J Oral Maxillofac Surg* 49:1163, 1991
2. Holmlund A, Hellsing G: Arthroscopic surgery of the temporomandibular joint. Internal derangement with persistent close lock. *Oral Surg Oral Med Oral Pathol* 62:361, 1986
3. Alkan A, Bas B: The use of double-needle canula method for temporomandibular joint arthrocentesis: Clinical report. *Eur J Dent* 1:1792, 2007
4. Rehman K-U, Hall T: Single needle arthrocentesis. *Br J Oral Maxillofac Surg* [Epub ahead of print] October 31, 2008. doi: 10.1016/j.bjoms.2008.09.014: