



Novel Modification of the Use of Peripheral Intravenous Catheters for Single Puncture Arthrocentesis of Temporomandibular Joint: A Technical Note

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Introduction

Arthrocentesis of TMJ first described by Nitzan et al. in 1991 is a simple conservative surgical procedure with minimal invasion and involves lavage of upper joint space and manipulation of joint, which releases the adhesions and so improves function [1]. The studies of arthrocentesis have been conducted from time immemorial and without doubt; these studies suggest arthrocentesis is an effective method in reducing pain and symptoms of temporomandibular joint disorders. The technique of two puncture needles has been well in practice since over two decades now. Recently, the concept of single puncture arthrocentesis has been introduced and is gaining wide popularity [2]. Multiple techniques for dual cannula preparation for single puncture arthrocentesis have been described in the literature such as Shepherds cannula and concentric cannula [3].

This technical note presents a novel modification of the use of two 21 gauge peripheral intravenous catheters,

which are commonly available in every clinical setup for single puncture arthrocentesis with separate inlet and output ports.

In this technique, two 21 gauge peripheral IV catheter needles were used. Markings were made on device using surgical marker at 25 mm, 30 mm, 35 mm on the needle. 25 mm marking corresponded to the maximum limit of depth of insertion of the needle in the joint space. The needles were held together beyond 35 mm using sterile bone cement to keep bone cement away from joint space. We fabricated a device with one needle bent at 45° at 35 mm marking and other needle straight which provided us with more ease of operation (Fig. 1). The device was sterilized using ethylene oxide gas.

Under auriculotemporal nerve block, joint was insufflated using lidocaine and normal saline. A line was drawn from the lateral canthus to the most posterior and central point on the tragus (Holmlund–Hellsing Line; Fig. 2). The point of entry was located along the canthotragal line, 10 mm from the middle of the tragus and 2 mm below the canthotragal line, and joint was entered [4].

Next, we flushed 300 ml of lactate ringer solution in the upper compartment using 10 ml syringe followed by manipulation of the joint. To ensure the ballooning effect with the irrigant before obtaining the outflow, the bevel of the needles was oriented in such a way that the needle tips remain approximating and bevel facing the opposite direction (Fig. 3).

The novel intravenous catheter arthrocentesis technique represents an easy to perform, cost effective and secure single puncture arthrocentesis. The main advantage is that the intravenous catheters are commonly used for vascular access in the health care setting and thus are available in almost every medical service worldwide hence making the technique economical.

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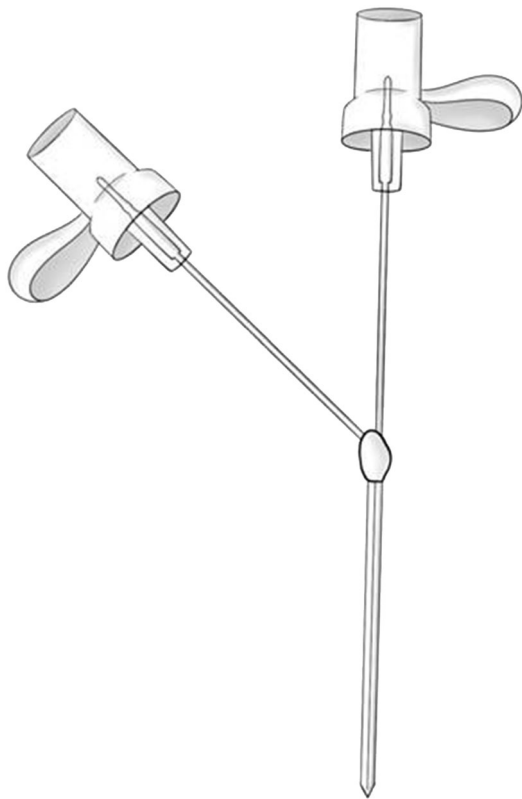


Fig. 1 Schematic diagram of device



Fig. 2 Point of entry of device

Single puncture arthrocentesis with the use of this technique is relatively easy to perform as there is single port of entry hence lesser tissue trauma. Separate inflow and outflow ports render better lavage of joint and 45-degree bend of needle provides ease of access and stability to device (Fig. 4).

This technique of arthrocentesis is used in ten patients which is safe and easy without any complications being encountered.

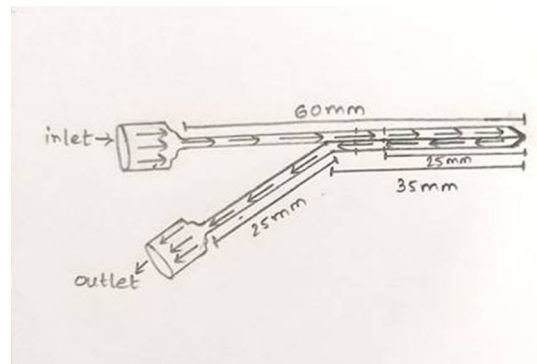


Fig. 3 Functioning principle of device



Fig. 4 Novel arthrocentesis device

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Declarations

Conflict of interest They authors declare that there is no conflict of interest.

Ethical Approval Ethical approval received from institutional ethical committee.

Consent to Participate Consent has been taken and documented.

Consent for Publication Consent has been taken and documented.

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