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Comparison of local and general anaesthesia for arthrocentesis of the temporomandibular joint

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Abstract

Arthrocentesis of the temporomandibular joint is an effective treatment for some disorders, and is usually done under local anaesthesia. We know of few studies that have compared the ease of arthrocentesis and its outcomes under local or general anaesthesia, so we studied 32 patients (n = 16 in each group). Postoperative oedema and pain, maximum mouth opening, duration of arthrocentesis, and ease of operation were assessed to compare the relative effectiveness of the two types of anaesthetic. Scores for duration of arthrocentesis ($p = 0.003$) and ease of procedure (0.004) differed significantly, while the other results were similar in the two groups. We noticed some superior outcomes when the procedure was done under general anaesthesia, but because of its limitations, selection of patients becomes more important.

Keywords: TMJ arthrocentesis; general anaesthesia; local anaesthesia

Introduction

Internal derangement of the temporomandibular joint (TMJ) may affect a patient's daily life with pain, dysfunction, joint sounds, and even aural symptoms. [1,2] Its management, which can be divided into conservative or surgical, is focused on the relief of pain and increasing the range of movements of the jaw. If conservative management fails, surgical interventions include arthrocentesis, arthroscopic lysis and lavage, arthroplasty, discectomy, and reconstruction of the TMJ, [3] and of these, arthrocentesis is the first choice. It is a minimally invasive and cost-effective procedure that reduces pain and increases the range of mandibular movement. It comprises blind lavage to remove any inflammatory content from the joint by reducing pain mediators and loosening the adherent disc by hydraulic pressure. [4,5]

Even though there are several published studies that have described and evaluated the advantages and complications of arthrocentesis, there is little information on its relative efficacy done under local or general anaesthesia. [6] The hypothesis of this study was that arthrocentesis is easier under general anaesthetic, and therefore provides a better outcome for the patient.

Our aim was to compare the ease of the procedure and operating time with standard manipulation under local or general anaesthetic, by evaluating the clinical outcomes.

Patients and Methods

The protocol was approved by the Hacettepe University Ethics Committee (GO 14/557-28). We studied 32 patients (4 men and 28 women) who were referred to the Hacettepe University Faculty of Dentistry, Department of OMFS,

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Table 1
Inclusion and exclusion criteria.

Inclusion criteria	Exclusion criteria
• Diagnosis of anterior disc displacement without reduction on magnetic resonance imaging • Periauricular pain • Limited mouth opening • Persistence of symptoms for at least 4 months	• Systemic diseases that affect the treatment • Orthognathic problems • Degenerative changes in the condylar head • History of condylar trauma and arthritis Lack of medical records

Ankara, Turkey, between June 2013 and June 2015 with consistent pain and functional complaints despite previous treatment, and whose records were complete. They had been diagnosed with anterior disc displacement without reduction based on findings of magnetic resonance imaging (Wilkes grade I–III). Subjects with missing data or who were lost to follow-up were excluded (Table 1). All patients were asked whether they would like to have the procedure under local or general anaesthetic, and patients were selected randomly for the two groups depending on their preference.

Patients in the local anaesthetic group were positioned semiupright, and the periauricular area was cleaned with antiseptic solution. The auriculotemporal nerve was blocked with articaine hydrochloride 40 mg/ml with epinephrine hydrochloride 0.006 mg/ml, (Ultracain® DS, Sanofi Aventis, Istanbul).

Patients in the general anaesthetic group were placed supine on the operating table, and the anaesthetic maintained by orotracheal intubation. After surgical preparation of the area with an antiseptic solution, a regional block was maintained by injection of local anaesthetic for postoperative pain control.

The method for arthrocentesis was standard in both groups, and a two-needle technique (as described by Nitzan et al) was used. [7] Ringer's lactate solution was injected through 50–100 ml syringes and, at the end of the lavage, hyaluronic acid 2 ml (Orthovisc® 30 mg in 2 ml, Biomeks, Ankara, Turkey) was flushed through the posterior needle. The needles were retrieved. A soft diet and mouth opening exercises were recommended postoperatively. Meloxicam (Melox, Nobel Pharmacy, Istanbul) was prescribed for postoperative inflammation and pain.

The operating surgeon graded the ease of operation on a visual analogue scale (VAS) (range 0–100 mm, 0 = very easy, 100 = very difficult). The time that elapsed from anaesthesia until the end of the operation (minutes) was noted as the operating time.

Postoperative oedema, pain, maximum mouth opening, and changes in joint sounds were also assessed. Facial oedema was evaluated using a tape measure. The three landmarks of measurement included the tragus-ala nasi, tragus-pogonion, and mandibular angle–external corner of the eye. Data were recorded before and immediately after arthrocentesis. Pain was assessed by using a VAS (mm) (0 = no pain, and 100 = worst pain possible). The mouth opening was measured with a tape measure. Both variables were noted preoperatively, and 20 days and 6 months postoperatively.

TMJ sounds were assessed by the operating surgeon before the operation using a VAS (mm) (0 = silent, 100 = crepitus). They were also assessed at 20 days and 6 months postoperatively by the same surgeon and noted as described.

All results were analysed using IBM SPSS Statistics for Windows (version 21, IBM Corp, Armonk, NY, USA). A repeated measures ANOVA test was used to compare the significance of differences between variables between groups over time, and an independent *t* test was used for comparing the significance of differences between groups.

Results

Sixteen patients (13 women and three men, mean (SD) age 35 (16) years) were operated on under local, and the other 16 patients (15 women and 1 man, mean (SD) age of 33 (13) years) under general, anaesthesia. The results of arthrocentesis during the first six months are shown in Table 2.

The operations were significantly easier under general anaesthetic ($p = 0.004$), but those under local anaesthetic were significantly shorter ($p = 0.003$). There were no significant differences in the degree of facial oedema immediately postoperatively. The amount of pain as measured by VAS was significantly less postoperatively ($p = 0.004$), and there was a significant improvement in mouth opening ($p = 0.004$), but the type of anaesthetic did not seem to make any difference.

Table 2
Statistical outcomes (n = 16 in each group). Data are expressed as mean (SD).

Measured variable	Local anaesthesia		General anaesthesia		Exact p value	
	Before operation	After operation	Before operation	After operation	Within group	Between groups
Facial oedema (mm)	102 (16)	129 (16)	97 (16)	123 (16)	0.002	0.414
VAS for pain	56 (29)	25 (11)	49 (26)	18 (10)	0.004	0.064
Maximum mouth opening (mm)	32 (8)	38 (6)	32 (7)	36 (7)	0.004	0.242
VAS for joint sounds	2 (0.9)	1 (0.4)	2 (0.8)	1 (0.4)	0.003	0.129
VAS for operating time (minutes)	-	10 (3)	-	17 (10)	-	0.003
VAS for ease of operation	-	38 (29)	-	27 (29)	-	0.004

VAS = visual analogue scale (1-100 mm).

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