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The next step in the treatment of persistent temporomandibular joint pain following arthrocentesis: A retrospective study of 18 cases

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ABSTRACT

Temporomandibular joint disorders affect a big portion of the population. There are a variety of treatment methods currently in use. Conservative treatment modalities are followed by more invasive approaches like arthrocentesis or arthroscopy. The aim of the study is to compare the effects of intra-articular tenoxicam injection and arthrocentesis plus viscosupplementation on patients in which a previous arthrocentesis plus viscosupplementation has failed to relieve pain and restore function. The study group consists of 18 TMJs in 16 patients (15 female and 1 male) and the patients were randomly divided into two groups as the arthrocentesis plus viscosupplementation group (*n*: 8) and tenoxicam injection (*n*: 10). 20 mg of tenoxicam was injected to the upper compartments of 10 joints without arthrocentesis. The other 8 joints were treated with a second arthrocentesis and sodium hyaluronate injection. VAS scores and maximum mouth opening with and without assistance were recorded in the post operative first week, first month and third month. The results show that there is little benefit in using relatively conservative methods once an arthrocentesis together with viscosupplementation has failed to relieve the patients pain. It is concluded that more invasive procedures should be considered for the patients who do not benefit from arthrocentesis.

1. Introduction

Temporomandibular joint (TMJ) disorders are degenerative joint disorders which are related to disc displacement (Roh et al., 2012) and that affect up to one third of the population. The chronic pain associated with TMJ degeneration not only limits chewing and talking, but also hinders basic daily activities and decreases the quality of life in the patients (Johansson et al., 2008; Magnusson et al., 2005). Management goals for patients with temporomandibular disorders (TMDs) include decreased pain, reduced adverse loading, restoration of functions, and resumption of normal daily activities (Okeson, 1996).

Current treatments for TMJ disorders are varied. Usually the initial conservative treatment is either medical, surgical or a combination of them (Ahmed et al., 2012). Rest, bite splints and the use of non-steroidal anti-inflammatory drugs (NSAIDS), or steroid or botulinum toxin injections are included in the initial treatment of patients with TMJ disorders (Sidebottom, 2009; Mountziaris et al., 2009).

Patients who do not respond to the conservative treatment modalities mentioned above and if symptoms like pain, restriction and locking persist, arthroscopy or arthrocentesis can be applied (Murakami et al., 2000; Goudot et al., 2000; Hosaka et al., 1996). Temporomandibular joint surgery is also applied in order to manipulate the disc and eliminate the adhesions so that mandibular function is improved and a decrease in pain is obtained (Holmlund, 2010). Arthrocentesis which is a simple and minimally invasive technique, has been reported and proven in many studies with long-term follow ups to be quite effective in reducing TMJ pain and improving mouth opening in the treatment of internal derangements of the TMJ (Hosaka et al., 1996). Arthrocentesis can also be used together with stabilizing splints in the treatment of closed lock patients (Ghanem, 2011). The procedure is often accompanied by intra-articular injections such as steroids, sodium hyaluronate and non-steroidal anti-inflammatory drugs (NSAIDs) (Wenneberg et al., 1991; Ishimaru et al., 2003; Nitzan et al., 1997; Van Oosterhout et al., 2006).

There are a limited number of studies, which provide controversial results about the benefit of intra-articular hyaluronic acid (HA)

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injections for the treatment of early stage TMJ disorders with non-reducible disc displacement. This procedure is called viscosupplementation which consists of repeated intra-articular HA injections and in many cases HA injections are performed following arthrocentesis. Injection of NSAIDs alone or in combination with arthrocentesis is another treatment modality for the inflamed synovial joint, since it helps to alter the intra-articular pressure and remove pain associated mediators from the synovial space, consequently resolving the synovial inflammation and pain (Ishimaru et al., 2003).

The use of intra-articular tenoxicam injection has been described for its long lasting (60–80 h) non-steroidal analgesic effect after arthroscopic knee surgery (Talu et al., 2002).

In this study, it is aimed to compare the effects of intra-articular tenoxicam injection and arthrocentesis plus viscosupplementation on patients in which a previous arthrocentesis plus viscosupplementation has failed to relieve pain and restore function.

2. Patients and methods

The patients were selected were selected from a population of patients who attended to Istanbul University Faculty of Dentistry, Department of Oral and Maxillofacial Surgery between July 2009 and December 2011 and had a diagnosis of temporomandibular joint internal derangement in at least one of the TMJs who had previously undergone arthrocentesis plus viscosupplementation and who had not shown any improvement regarding TMJ pain and function.

2.1. Study design

2.1.1. Inclusion and exclusion criteria

18 TMJ s in 16 patients (15 female and 1 male) were included in this study. The age range of the patients was between 19 and 57 with an average of 30.8. All the patients included in the study had clinical and radiological diagnosis of TMJ internal derangement and the patients' clinical diagnosis was made according to the Wilkes classification (Table 1). All the patients had previously undergone arthrocentesis plus viscosupplementation, had been followed up for six months and had shown no signs of improvement in terms of pain and function. Pain and pain on function was recorded on a visual analog scale of 10 in which 0 was no pain and 10 was the worst pain ever. The patients who were included in the study did not show any decrease in VAS scores at the end of six months. Function was evaluated in terms of maximum mouth opening. The patients included in this study had also shown no improvement in these parameters.

Table 1
The list of patients and treatment modalities.

Wilkes	Sex	Age	Treatment
3	F	23	Tenoxicam injection
2	F	57	Tenoxicam injection
4	F	36	Tenoxicam injection
5	F	20	Tenoxicam injection
2	F	28	Tenoxicam injection
1	F	37	Tenoxicam injection
1	F	37	Tenoxicam injection
4	F	27	Tenoxicam injection
5	F	20	Tenoxicam injection
5	F	20	Tenoxicam injection
4	F	23	Arthrocentesis + viscosupplementation
3	F	31	Arthrocentesis + viscosupplementation
2	F	42	Arthrocentesis + viscosupplementation
5	F	51	Arthrocentesis + viscosupplementation
4	F	23	Arthrocentesis + viscosupplementation
4	F	27	Arthrocentesis + viscosupplementation
3	F	19	Arthrocentesis + viscosupplementation
5	M	33	Arthrocentesis + viscosupplementation

The patients were randomly divided into two groups of 10 as the arthrocentesis plus viscosupplementation group, in which two patients dropped out due to non-cooperation during follow ups (n: 8) and tenoxicam injection group (n: 10). The patients were divided into two groups by simple randomization using online randomization software.

Patients were excluded from the study if they had systemic contraindications for arthrocentesis, previous TMJ surgery, trauma to or fractures of the TMJ, condylar hypoplasia or hyperplasia or tumours were present. Patients with myofascial pain alone were also excluded from the study.

2.1.2. Preoperative Measures

The patients' pain scores were recorded on a visual analogue scale (VAS) of 0–10 before the procedures and pre-operative maximum mouth opening with and without assistance were also recorded. All of the patients had used stabilization splints at night for the preceding 3 months and continued using the splints in the three months of follow up period.

2.1.3. Treatment Procedures

All of the procedures were carried out under local anaesthesia. 20 mg of tenoxicam (Oksamen-L 20 mg, Mustafa Nevzat, Tr) was injected to the upper compartments of 10 joints without arthrocentesis.

The other 8 joints were treated with a second arthrocentesis as described by Nitzan (15) with sodium hyaluronate (Orthovisc, DePuy Orthopaedics, Massachusetts, US) injection.

The arthrocentesis was performed as follows: a 20 gauge needle was inserted into the upper joint space. Ringers lactate solution injection and aspiration confirmed the correct positioning of the needle in the upper joint space. Following the first needle, a second needle was inserted to the second joint space about 8–10 mm anterior to the first entrance point. The joint was passively flushed with 300 ml of Ringers lactate solution. The flow of the solution was stopped and 1 ml of sodium hyaluronate was injected to the upper joint space. Non-steroidal anti-inflammatory drugs (meloxicam 15 mg, once a day) were prescribed to all of the patients following injections.

All of the patients in the arthrocentesis group were given active and passive mouth-opening exercises starting on the seventh day of the procedure. All of the patients in both groups were advised to go on soft diet following the procedures.

2.1.4. Post-operative measures and follow-ups

VAS scores and maximum mouth opening with and without assistance were recorded in the post operative first week, first month and third month.

2.2. Statistical analysis

A software package (SPSS 11.0; SPSS, Chicago, IL) was used for statistical analysis. The differences between the groups for age, initial VAS scores, and initial maximum and assisted mouth opening values were compared using Mann–Whitney-u test. Significance was set at $P \leq 0.05$. The differences between the groups for the stage of the disease were evaluated using a chi- square test and the significance was set at $P \leq 0.05$. The differences within the groups were evaluated using Wilcoxon signed ranks test and the significance was set at $P \leq 0.008$.

3. Results

Preoperatively there was no difference between the groups for age and Wilkes stages ($p > 0.05$) (Tables 2 and 3). Initial VAS scores of the patients did not show any statistical significance ($p > 0.05$)