

Efficacy of Arthrocentesis for Management of Internal Derangement of TMJ with and Without Injection Sodium Hyaluronate-A Comparative Study

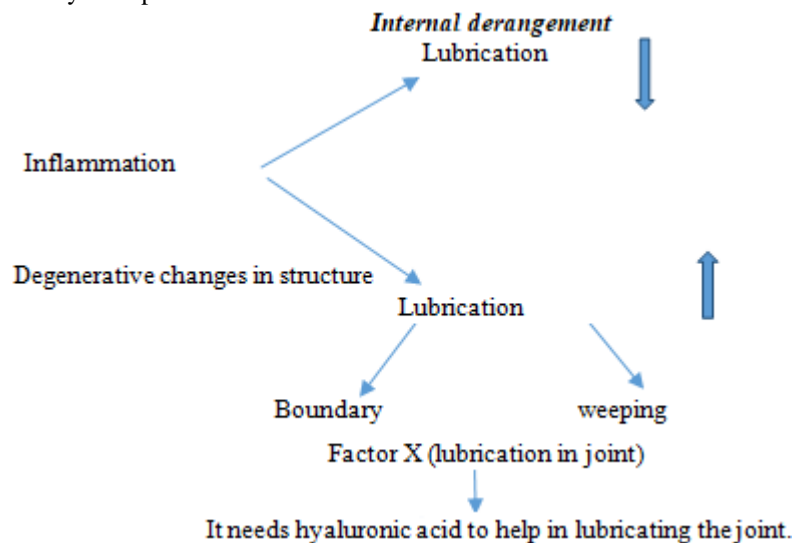
Dr. Nishikasaraswat

Department of Oral & Maxillofacial Surgery

1. Introduction

Arthrocentesis is traditionally defined as a procedure in which the fluid in a joint cavity is aspirated with a needle

and a therapeutic substance is injected. It is basically lavage of the joint in which solution ringer lactate pass through the upper joint space or flush this joint space through the ringer lactate.



2. Aims & Objectives

To establish the role of sodium hyaluronate as an adjunctive in treatment of internal derangement of TMJ along with ringer lactate for arthrocentesis and to determine its efficacy.

- To decrease symptoms (Pain)
- To increase mouth opening
- To improve range of movement of TMJ
- To evaluate the role of Sodium hyaluronate as a therapeutic agent

3. Methodology

Patients reporting to the Department of Oral and Maxillofacial Surgery, with diagnosis of Internal Derangement on the basis of clinical basis were considered in the study.

Group A, with SH- 25 patients

Group B, without SH- 25 patients

Inclusion Criteria

- Patient having difficulty in mouth opening & reduced jaw movements
- Patient having pain & clicking sound in temporomandibular joint
- Patients with deviation of mandible to the involved site
- Patient available for periodic review

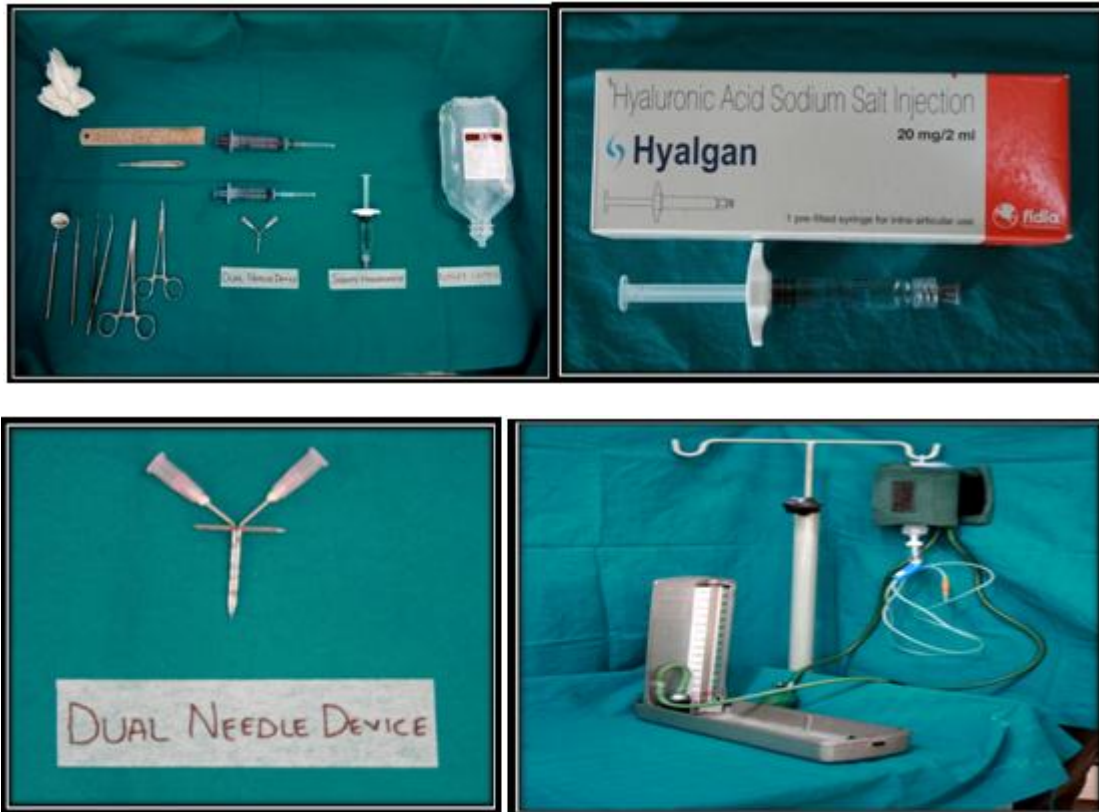
Exclusion Criteria

- Any previous invasive procedures on the TMJ
- Evidence of psychology problems
- Gross protracted mechanical restriction
- Bony ankylosis, advanced resorption of the glenoid fossa and malignant tumors

All patients were informed regarding the purpose of study and effects of drugs used.

Armamentarium

Betadiene 10%, ringers lactate, ruler, dual needle device, clonazepam 25mg, sodium hyaluronate, sphygmomanometer.



4. Procedure

- 1) Oral sedative (clonazepam 25mg) hour before the procedure.
- 2) Semi seated position.
- 3) Antiseptic swab in ear.
- 4) Then precisely locate the site of puncture.
- 5) Starting at the midpoint of the tragus, and following the trago-canthal line (Holmlund line), it is located 1 cm anterior and 2 mm inferior to the line.



- 6) Local anesthesia is performed using 2% lignocaine with 1/200,000 adrenaline.
- 7) Inject the solution subcutaneously at the area of puncture and then direct the needle anteriorly and superiorly down to the zygomatic arch.

- 8) After that, penetrate the upper compartment of the joint and distend it with 2 mL of the same anesthetic solution



- 9) The dual-needle device is then directed anteriorly and superiorly until contact is made with the zygomatic arch. Keeping close contact with the bone in this area, slide both needles in the upper compartment.
- 10) Ask the patient to open the mouth and to shift the mandible to the opposite side to facilitate entry into the joint space. Once inside the joint space, attach 1 of the needles to an intravenous line hooked to a 300-mL lactate ring bag.



- 11) Hydraulic pressure is obtained by inflating a tourniquet (300 mm Hg) around the bag.
- 12) Flush 300 mL of lactate Ringer solution under pressure in the upper compartment.
- 13) During the lavage, ask the patient to mobilize the mandible as much as possible and passively manipulate the joint to aid in the release of adhesions.
- 14) At the end of the procedure, detach the intravenous tubing.



- 15) In patients where sodium hyaluronate is used 1 mL of sodium hyaluronate is injected in the joint space through 1 of the hub while occluding the other with a finger.
- 16) Then the device is completely withdrawn.
- 17) A small Elastoplast covers the puncture site.
- 18) The patient is discharged when stable, usually 30 minutes after the procedure.



Postoperative instructions

- 1) Joint rest for 3 days
- 2) Soft diet
- 3) Continued physiotherapy exercise
- 4) NSAID -1 week post op
- 5) Muscle relaxant -1 week post op
- 6) Continued follow up

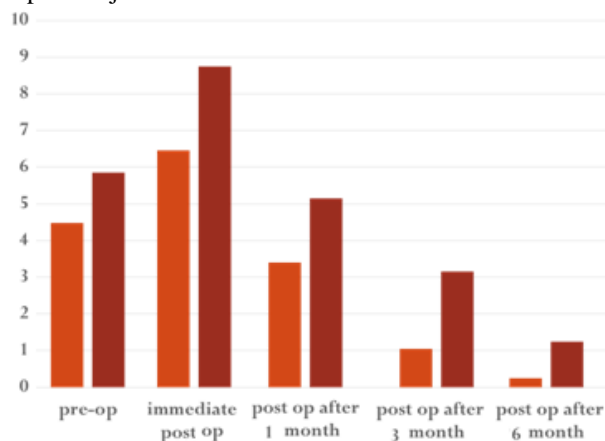
Parameters

- 1) Pain
- 2) Postoperative analgesics
- 3) Mouth opening
- 4) Presence of joint noises
- 5) Deviation on maximum mouth opening.
- 6) Protrusion
- 7) Any complication

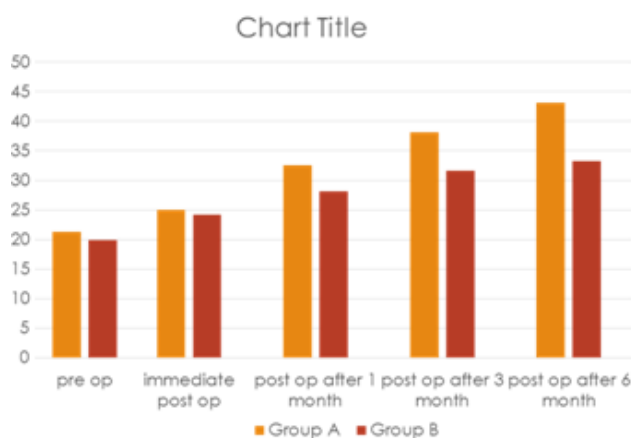
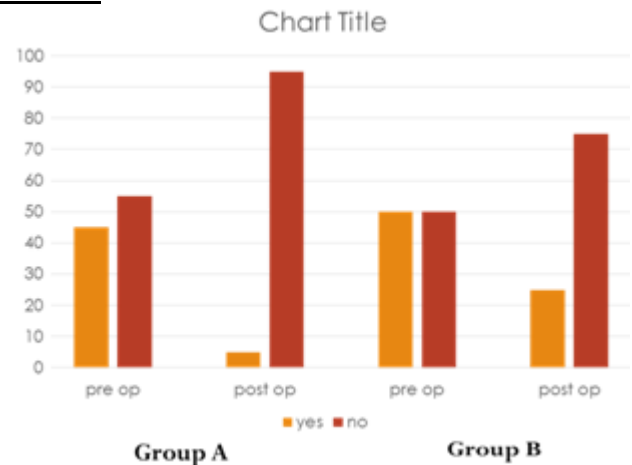
5. Results & Observations**Pain**

Pain intensity is assessed with a visual analogue scale.

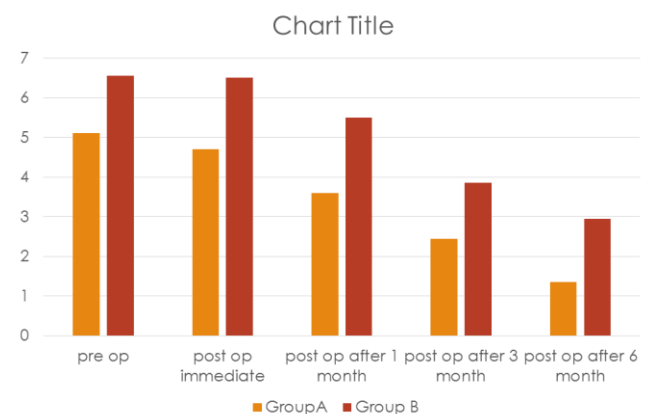
Mean + Sd of pain score at various intervals of group-A & group-B subjects

**Mouth opening**

Mean + Sd of mouth opening (in mm) at various intervals of group-A & group-B subjects

**Deviation****Joint noises**

Mean + Sd of Joint Noises at various intervals of group-A & group-B subjects

**6. Results**

- 1) Mouth opening was significantly improved in group A subjects.
- 2) In terms of pain, 80% subjects in group A had reduction in pain on postoperative follow up.
- 3) Clicking was reduced nearly in 100% of patients.
- 4) Protrusive movements significantly improved in group A.

7. Conclusions

Thus, it may be concluded that arthrocentesis with injection SH is a preferred treatment for the patient suffering with TMJ ID & restoring its function who were refractory to conservative methods.

8. Discussion

- An efficient lubrication system in the TMJ is absolutely necessary so the disc can slide along the slope of the eminence.
- Two major constituents are responsible for free joint movement: surface active phospholipids and hyaluronic acid.

- Joint loading and parafunction converts shearing forces into compressive stresses which leads to interruption of blood supply and collapse of the lubrication system leading to development of hypoxia-reperfusion cycle; which in-turn releases radical oxygen species (ROS) superoxide and hydroxyl ion.
- These ROS destroy hyaluronic acid causing a marked decrease in the synovial fluid viscosity thus causing degradation of surface active phospholipids by phospholipase and leading to rupture of articular surface.
- The absence of lubricant, leads to increased adhesiveness, friction, shear, and rupture of articular surfaces. This may cause pain, sounds such as clicking or crepitus, and irregular or deviating jaw function.
- Arthrocentesis with SH is thus an effective way of lubricating the joint as well as reducing the related inflammatory responses.

References

- [1] UmutTuncel Journal Repeated sodium hyaluronate injections following multiple arthrocenteses in the treatment of early stage reducing disc displacement of the temporomandibular joint: A preliminary report. J Cranio-Maxillo-Facial Surgery december,40:8;685-689, 2012
- [2] Guarda-Nardini, Two-needle vs. single-needle technique for TMJ arthrocentesis plus hyaluronic acid injections: a comparative trial over a six-month follow up. Int. J. Oral Maxillofac. Surg.; 41: 506–513, 2012
- [3] L. Dunphy,V. Sood, D. Koppel Is there any benefit of temporomandibular joint arthrocentesis? British Journal of Oral and Maxillofacial Surgery 49 S26–S116,2011
- [4] Arati S. Neeli ,MeenaxiUmarani , S. M. Kotrashetti ,ShridharBaliga Arthrocentesis for the Treatment of Internal Derangement of the Temporomandibular Joint J. Maxillofac. Oral Surg. DOI 10.1007/s12663-010-0155- 2010
- [5] Dorrit W. Nitzan, Arthrocentesis Incentives for Using This Minimally Invasive Approach for Temporomandibular Disorders Oral Maxillofacial SurgClin N Am 18: 311–328 ;2006
- [6] Gokhan H. Alpaslan, CansuAlpaslan Efficacy of temporomandibular joint arthrocentesis with and without injection of sodium hyaluronate in treatment of internal derangements J Oral MaxillofacSurg 59:613-618, 2001