

# Efficacy of Arthrocentesis With or Without Sodium Hyaluronidase : Report of 2 Cases

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### Introduction

- The term temporomandibular joint disorder describes a condition that involves temporomandibular joint pain and dysfunction
- Internal derangement involves an abnormality of the disk fossa relationship, which results in a mechanical disorder that creates irregular joint noises and prohibits normal, smooth condylar movement.
- Conservative management includes:-
  - Patient resting the specific jaw
  - Soft diet
  - Analgesic
  - Splints
  - Physiotherapy
  - Isometric exercise
  - Laser therapy
- Surgical treatment can be invasive which includes plication, arthroscopic, disk repositioning surgery, disk repair or removal and condylectomy.
- Arthrocentesis is the first line procedure for acute and chronic "closed lock" of the temporomandibular (tmj), is a simple minimally invasive and effective procedure with proven long term result and minimal potential complication.
- Ringer lactate and physiological saline are commonly used to lavage upper joint space, which break down minor adhesions, remove all joints catabolites and inflammatory mediators to gain asymptomatic range of motion of mandible
- Sodium hyaluronate is largely responsible for viscosity and rheological properties of synovial fluids. Its function is regulating the nutrition of the articular cartilage and reducing friction between surfaces.

### Case Report

- Patient was divided into two groups:-
- Case 1:- Arthrocentesis with Ringer's lactate solution

- Case 2:- Arthrocentesis with Ringer's lactate solution followed by Sodium Hyaluronate
- Case 1
- Local anesthesia block of auriculo-temporal nerve was given to patient.
- Patient was seated inclined at 45 degree angle with the head turned to the contralateral side to provide an easy approach to the joint treated
- After proper preparation of the target site the external auditory meatus was blocked with the moist cotton
- A line was drawn from the middle of the tragus to the outer canthus of the eye.



- Posterior entrance point was located along the cantho-tragal line 10mm from middle of the tragus line and below (point A); the anterior entrance point placed 10mm further forward along the line and 10 mm below it (point B)
- These markings over the skin indicate the location of the articular fossa and the eminence of the Tmj.
- Total 200ml of Ringer Lactate solution was used to perform Lavage of upper joint space



- During this mandible was moved through opening, excursive and protrusive movements to facilitate lysis of adhesion and the procedure is repeated after 1 week as 2<sup>nd</sup> intervention.
- Case 2
- Arthrocentesis was done as described in the previous group followed by 2ml intra articular injection of Sodium Hyaluronate

(20mg per ml)

- 1 ml was injected in superior joint cavity as 1<sup>st</sup> intervention and other 1 ml was injected on 7<sup>th</sup> day as 2<sup>nd</sup> intervention.
- Patient were follow at regular interval of 1 week after 1<sup>st</sup> intervention, 1 week after 2<sup>nd</sup> day intervention, 1<sup>st</sup> month, 3<sup>rd</sup> month, 6th month and assessed in terms of relief of symptoms, achievement of maximal mouth opening and pain free movements and complications if any

Sodium hyaluronate injection 1ml given



### Diagnostic Tools

- \_Diagnostic tools to assist in assessing the severity and quality of pain experienced by the patient is verbal numeric analog scale



0 = No Pain

1-3 = Mild Pain (nagging, annoying)

4-6 = Moderate Pain

7-10 = Severe Pain

Above parameters were compared at day 7, day 30, day 90, and day 180 as follows –

Parameters	Group I	Group II
Maximum mouth opening (mm)		
TMJ clicking sound*		
Lateral excursion (mm)		
Left		
Right		
Protrusive movement (mm)s		
VNAS (verbal numeric analog scale)		

\* TMJ Clicking :- Present – P, Absent – A

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**Discussion**

- Osteoarthritis, or degenerative joint disease, is characterized with the degeneration and abrasion of the cartilage and the simultaneous remodeling of the bone below it.
- Quinn et al <sup>6</sup> identified certain cytokines generated by monocytes and macrophages, such as prostaglandin E<sub>2</sub>, leukotriene B<sub>4</sub>, interleukin-1, interleukin-6, and tumor necrosis factor, are infiltrated into the synovium which are found to be responsible for degeneration of the synovial fluid by loss of viscosity and lubrication of the articular cartilage and disc and ultimately evoke pain. When joint is overloaded, the hypoxia reperfusion cycle evokes non-enzymatic release of radical oxygen species which degrade hyaluronic acid causing marked decrease in synovial viscosity. In the absence of lubrication there is increased adhesiveness, friction, shear, and rupture of articular surfaces
- The aim of arthrocentesis is to remove inflamed synovial fluid from joint space, provide appropriate synovial fluid viscosity and remove adhesions by application of hydraulic pressure.
- The idea of TMJ arthrocentesis and lavage was first borne out of the successful use of TMJ arthroscopy not only as a diagnostic tool, but also as a therapeutic technique resulting in remarkable improvement in pain, jaw opening and function in selected patients through the simple process of

- lavaging the superior joint space.
- Mechanism of arthrocentesis is as unclear, because the cause of limited motion and the pathology remains an enigma. Pressure of fluid injected into the joint during arthrocentesis may facilitate joint movement by releasing intra-capsular adhesions
- Murakami et al (1987) was first to find excellent results in releasing closed lock by arthrocentesis lavage and lysis.<sup>37</sup>
- They concluded that arthrocentesis, rather than being an alternative to arthroscopic surgery, would be indicated for patients with acute TMJ closed lock refractory to medication and mandibular manipulation.

Moses and Poker (1989) reported that arthrocentesis treat both mechanical and inflammatory aspects of TMJ internal derangement.

Kopp et al (1985) first published the intra-articular hyaluronic injection as a new approach in treatment of TMJ disorders. Kopp and Bertolami (1993) found improvement in subjective symptoms after sodium hyaluronate injection.

Hyaluronic acid is a major natural component of synovial fluid that plays an important role in lubrication of synovial tissues and improve synovial fluid viscosity. However exact mechanism of sodium hyaluronate is still unknown

**Conclusion**

Based on the range of data available in this study we can conclude that:-

- The tmj pain was found to be relived better in the patients who underwent postarthrocentesis intra articular injection of sodium hyaluronate.
- Mouth opening at subsequent follow up in patients who underwent post arthrocentesis injection of sodium hyaluronate was found better than arthrocentesis with RL group
- With sodium hyaluronate excursion movement was greater at 6 month of follow up compared with RL group
- Clicking sound improved quicker in sodium hyaluronate group than in RL group

**References**

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