

TMJ arthrography

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Abstract

Imaging has contributed in diagnosis as well as to understand the temporomandibular joint dysfunction. Dysfunction of the temporomandibular joint may be caused either by the osseous components or the soft tissue components of the joint and sometimes, both. The most commonly followed arthrographic techniques are either single contrast or the double contrast arthrography. They are useful in delineating the articular space, detection of perforations in articular disc and other internal derangements. Arthrography is a well-known procedure being tagged as the "gold standard" in the detection of internal derangements of the TMJ, even though advanced imaging modalities like MRI have been made available.

Keywords: TMJ, Diagnosis.

Introduction

Imaging has contributed in diagnosis as well as for comprehending the TMJ developmental and functional abnormalities. It plays an important role in recognizing the underlying mechanism, which in turn helps the treating physician in deciding the most suitable diagnostic procedures. Selection criteria reflect the modality of imaging required. "Selection criteria" signifies not only the clinical signs but also the symptoms which will help the physician to arrive at a radiographic diagnosis all of which will help in the diagnosis of the underlying pathogenesis.

The abnormal function of the TMJ can be attributed to the osseous structures otherwise it may involve the soft tissues only and rarely it may involve both the components together.¹ Soft tissue is better visualized by the conventional imaging modality which is arthrography while the advanced imaging modality is magnetic resonance imaging. Herein, we will be focused on the types of arthrography which are most commonly used to detect the TMJ abnormalities.

Arthrography

In 1947, Dr Fleming Norgaard made use of a positive contrast agent in arthrography for TMJ visualization. However, the procedure was not globally acclaimed until the year 1970, when Wilkes unmasked the technique of arthrography in the United States by the inoculation of a radiopaque contrast material into the temporomandibular joint spaces.²

Single and double contrast arthrographic techniques are practiced worldwide, with standardization of the procedures worldwide making it easier.

Procedures

Patient lies in lateral position on a fluoroscopic table with head in a tilted position. In fluoroscopic guidance, a metal marker is used to identify the posterior and the superior part condyle of the mandible. Later the portion is discernible with the help of an ineffaceable marker.

On the superficial skin surface 1% of lidocaine is insinuated with the help of a scalp vein needle. Stimulation of the loose bodies in the TMJ space can be averted by making the tubing packed with contrast agent free of air bubbles.

At the right angle to the X-ray beam and skin and X-ray beam of a pre-determined closed condylar position, the needle is inserted and observed fluoroscopically.

Patient is asked to open the mouth slowly with the guidance of the needle against the posterior incline of the condyle.

In the lower TMJ space, below the articular disc, 0.4-0.5ml of contrast agent is delivered, with the fluoroscopic help. Opaque material in the anterior part of the condyle may be appreciated when the contrast agent is in the lower TMJ space into the anterior recess of the lower joint compartment.³

Needle is removed and fluoroscopic images are documented all through the opening and closing movements of the jaws. (Fig. 1)⁴

Injection of contrast agent into the lower TMJ space, is referred to as lower joint space or single contrast arthrography. However, when we see the contrast material in the upper TMJ space without injecting in that space, then we can suspect, damage to the articular disc.³

When the contrast agent is injected into both the upper and lower TMJ space, it is called double contrast arthrograph.⁵ This further helps in getting a clear picture of the outline of the articular disc.⁵ (Fig. 2)⁴

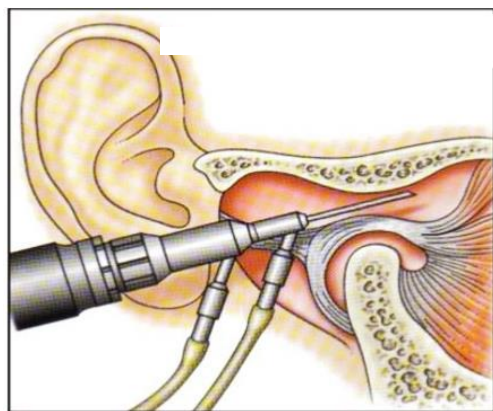


Fig. 1: Arthrography technique

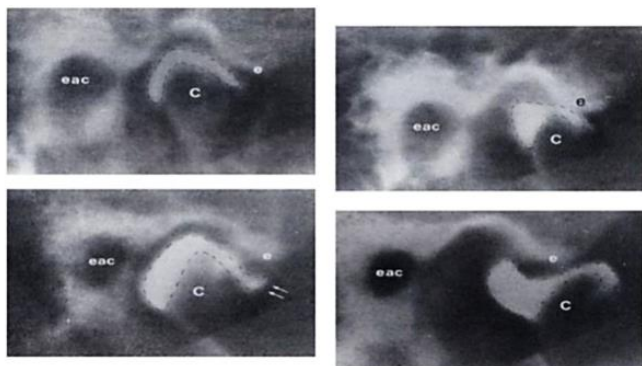


Fig. 2: Radiographic images of TMJ seen in arthrography (C-Condyle; EAC – E- External auditory canal)

Advantages

1. Fluoroscopically, abnormalities like discontinuation, any tear or adhesion can be appreciated. Also non-static articular action of the articular disc and fluid accumulation can be seen.¹
2. Sampling of synovial fluid along with lavage of the joint is possible at the same time, as during arthrography.⁶
3. Shape and position of the disc is appreciable,⁷ which can be enhanced with tomography.⁸
4. Joint mice can be diagnosed.⁹
5. An internal derangement and inflammation can be distinguished by an arthrogram.¹⁰

Limitations

1. Severely de-formed disc are excluded from this procedure.¹
2. Medial or Lateral articular disc displacements pose a challenge during interpretation.⁷

Complications

1. Significant radiation exposure during the procedure is possible.⁹
2. Most common hitches of the procedure include contrast medium extravasation into the capsule and soft tissues around the joint, causing pain, which can be minimal when non-ionic contrast media is used.¹⁰

3. Rarely, intra-vasation of the contrast agent transpires. To avoid an acute hypotensive incident, about 0.03 ml epinephrine for each 3ml of contrast agent is suggested.⁹
4. Large needles and cannulas can be a cause of parotitis in arthrography.⁹
5. The cannula tip can be lost in the joint region.⁹
6. Due to increased anxiety, there may be vagal attack, which can be managed by administering 0.6 mg of Atropine intravenously.⁹
7. Transient facial paralysis is another complication when there is vigorous infiltration of lidocaine.¹⁰
8. NSAIDS such aspirin/ acetaminophen or other superficial techniques such as cold compress is highly beneficial in treating the pain.⁹

Conclusion

Arthrography is a well-known procedure being tagged as the "gold standard" in the detection of internal derangements of the TMJ, it works as an aide to the clinical diagnosis. The proficiency to identify the internal derangements of the TMJ with increased accuracy levels make it the diagnostic imaging modality of choice preferred by the physicians. Even though it is an invasive procedure, it's benefits outweigh the non- beneficial aspect as well as its complications.

Conflict of Interest: None.

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