Air arthrograms for intra-articular injections of the hip

A. VOLPIN, Vikas KHANDUJA,

From the Department of Trauma and Orthopaedics, University College London Hospitals, 235 Easton Road, NW1 2BU, London, United Kingdom

Intra-articular hip injection is a widely used technique for diagnostic investigation and therapeutic modality in patient with femoral acetabular impingement (FAI) and other pathology around the hip joint.

We describe our technique and experience in performing hip injection using a lateral approach and confirmation of the correct position inside the joint with an air arthrogram.

This technique is a simple, safe, and accurate alternative to the other methods based on the using an iodine contrast arthrogram, that can cause possible severe reactions.

Keywords: hip joint.

INTRODUCTION

Intra-articular hip injection is a widely used technique for diagnostic investigation and therapeutic modality in patient with femoral acetabular impingement (FAI) and other pathology around the hip joint.

We describe our technique and experience in performing hip injection using a lateral approach and confirmation of the correct position inside the joint with an air arthrogram.

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TECHNIQUE

The patient is placed supine and standard preparation with Chlorhexidine and draping is carried out.

10 ml of 1% lidocaine is infiltrated on cutaneous and subcutaneous tissues followed the palpation of the tip of the greater trochanter, while in some selected cases, the procedure is performed under a general anaesthesia.

The hip is in slight internal rotation so that the foot is pointing to the ceiling and the greater trochanter is easily palpable.

An image is obtained on the fluoroscope to view the hip joint.

The femoral head-neck junction is identified under the imagine intensifier, and an 18-gauge needle is advanced along the lateral side of the
neck until the needle hits the femoral neck. The needle is then withdrawn by about 2mm and the joint is aspirated to confirm that the needle is not in a vascular structure. Five ml of air is then injected into the joint and an air arthrogram is obtained to confirm the correct intra-articular entry. The air should envelop the intra-articular capsule creating an air ring sign (Fig. 1). In case of extra-articular position of the needle, the air is diffusely spread in the surrounding tissue and the procedure needs to be repeated. Then leaving the needle in the correct position, the hip joint is injected with chosen agent. The whole procedure if performed in this fashion does not take more than 10 minutes.

Wani et al. (24) showed excellent results using the same air arthrogram technique.

There have been no reported serious complications in adults having hip arthrography using air as contrast, while in some case reports involving neonates hypoxia, desaturation and even cardiac arrest have been described (7,11,17,20,21).

Especially in babies or young children, there are several case reports describing air emboli after hip arthrography (9,12), in particular Lamdan et al. (11) hypothesized that due to their size, young children are more sensitive to intravascular air.

Furthermore Shahid et al. (22) demonstrated that the air arthrogram may also have a role in saving finances because the ten vials of OmnipaqueTM, the most common used contrast, cost £208.01 and air certainly is free. In the senior authors practice as well, air arthrograms have been used for the past 8 years without any adverse events or complications.

The increasing indications of intra-articular hip injections have led authors to develop techniques which try to make it a routine step in the outpatient setting (2,13,15).

Ultrasound is also being used increasingly. Byrd et al. (2) showed that ultrasound-guided injections were more convenient and less painful than fluoroscopy-guided ones. Levi (13) found 100% accuracy in 11 sonographically guided hip injections performed in outpatient office setting. However, it is well known that the ultrasound technique is limited by the operator experience, who needs a proper mentoring from an experienced practitioner and is also dependent upon the body mass index (BMI) and the size of the hip joint in each individual and may make the procedure difficult.

Masoud and Said (18) demonstrated a 95% success in 40 patients (with a 95% confidence interval of 0.84 to 0.99) in needle placement inside the peripheral compartment of the hip joint, using the proximal anterolateral portal for hip arthroscopy as the needle insertion point without imaging guidance in the outpatient clinic. Mei-Dan et al. (18), in another series, found a 93% success in needle positioning using an anterior approach for non-image-guided intra-articular injection of the hip joint rate in 55 patients. On the contrary,
in a cadaveric study, using anatomical landmarks, without fluoroscopic guidance, Leopold et al. (12) reported only 60% success in the anterior injection approach, and the needle pierced or contacted the femoral nerve in 27% of the cases. They found 80% success using the lateral injection approach and no cases of contact with the femoral nerve, so they recommended the lateral approach as safer for needle placement in the hip joint.

At our institution we perform more than 100 diagnostic and therapeutic hip injections per annum. The diagnostic hip injection is a fundamental tool in patients, who have intra-articular soft-tissue abnormalities such as labral tears or chondral lesions visible on MRI scans and a history and examination which does not support the MRI findings (16). Traditionally we have relied more on the response to an intra-articular hip injection than the findings shown on the magnetic resonance imaging scans and subsequently guide us in which treatment to offer to the patients.

The procedure presented in this article, has been already described in previous studies (22,24) however our technique slightly varies from the others because we used a lateral approach for air arthrogram technique and so far we have achieved 100% accuracy without any complications.

When performed with the antero-lateral approach sometimes it possible to wrongly inject the psos sheath that lies directly in front of the capsule of the hip joint (22).

Our method does not require a long learning curve as in the ultrasound or using only anatomical landmarks techniques, on the contrary it can well be performed in every operating theatre without special equipment.

At our institute is generally performed by an orthopaedic specialist trainee or either a consultant.

In conclusion the described technique of using an air arthrogram as contrast during fluoroscopy guided intra-articular injection is a relative quick, cost-effective and reproducible procedure with no complications and therefore should be the gold standard for performing these injections.

REFERENCES


