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# Pharmacological treatment with corticoid or hyaluronic acid injections into subtalar joint via lateral access

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## ABSTRACT

Pharmacological treatment, such as corticoid or hyaluronic acid intra-articular injections, is consistently used for osteoarthritis cases in which conservative treatment failed. The use of intra-articular injections aims to decrease pain and restore function, at least partially and temporarily [1]. Nonetheless, the indication for foot joint injection is restricted, especially for the subtalar joint, since there is a lack of reports which provide technical information on this subject.

This protocol provides a step-by-step guide for performing subtalar intra-articular injection, which is a simple procedure that consists of inserting a needle in the subtalar joint to dispense pharmacological treatment directly in contact with the tissues committed by osteoarthritis. Since the intra-articular injection technique is invasive, there is a need to be cautious about performance to minimize risks of infection, discomfort, lesions and pain. For this, orthopedists might employ some methodological precautions as well as take special care regarding joint access.

The lateral route is easy to perform since it uses the anterior edge of the lateral malleolus tip as a landmark. Beyond that, there are no neurovascular bundles or tendons in the needle's path. However, in our literature searches, we did not identify records considering this route, except for previous articles by our group [2,3], which showed positive effects of corticoid and principally hyaluronic acid injections. Thus, we point the lateral access as a safe route, reinforcing the need to disclose this technique.

## GUIDELINES

Patients with symptomatic osteoarthritis (CID 10) at the subtalar joint would benefit from the intra-articular injection protocol scheme, including the ones whose osteoarthritis etiology is secondary to trauma. Recommendation concerns patients over 18 years of age diagnosed with symptomatic osteoarthritis by a

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specialist foot and ankle orthopedist. The procedure should not be recommended for patients with subtalar osteoarthritis who have ankylosis or arthrodesis of the joint, hypersensitivity to hyaluronic acid or corticosteroids, pregnancy or breastfeeding, rheumatological diseases, ulcer or open wound at the incision site and dyscrasia.

There is no specific orientation for corticosteroid use and viscosupplementation at foot joints. Although the American College of Rheumatologists strongly recommends corticoid injection [4], the OARSI (Osteoarthritis Research Society International) points to short-term use for symptomatic relief [5]. Considering possible deleterious effects of corticoid (6), its use might be limited. At the other way, the viscosupplementation is recommended by European Consensus Group on viscosupplementation (EUROVISCO) when treatment with non-steroidal anti-inflammatory drugs fails [7]. Furthermore, the OARSI (2020) postulates that hyaluronic acid may be safer than corticoid for longer protocol schemes [5]. In this way, retrospective studies suggest that patients could benefit from reapplication.

Mei-Dan and colleagues demonstrated that patients submitted to viscosupplementation with 10mg sodium hyaluronate (Euflexxa) administered weekly to the subtalar joint for 3 weeks improved the American Orthopaedic Foot and Ankle Society Ankle Hindfoot score (AOFAS) and on Visual Analogue Scale (VAS) till 28 weeks after injection [5]. Other studies regarding the same protocol scheme showed that similar results were achieved by the use of 20mg sodium hyaluronate (Polireumin) [2] or by the combination of 20mg sodium hyaluronate (Polireumin) with 10mg of betamethasone sodium phosphate ]3]. However, isolated corticoid injection effect was limited to 4 weeks, having returned to the original parameters after 12 weeks of the first injection [3]. These results indicate that the protocol scheme of weekly injection for three weeks is efficient. In addition, it reinforces a more persistent effect of the treatment of hyaluronic acid compared to the isolated corticosteroid.

**Table 1. Recommendations to guide the choice of medication, its dose and maximum volume.**

| A | B | C | D |
|---|---|---|---|
| **Medication** | **Dose** | **Volume injected** | **Protocol scheme** |
| **Hyaluronic acid** | 10-20mg/mL | Till 2mL | One injection per week during three weeks. Scheme can be repeated after 6 months or when the symptoms return |
| **Corticoid** | 10mg/ml | Till 2mL | |
| **Hyaluronic acid + Corticoid** | 10-20mg/mL + 10mg/ml | Till 4mL | |

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## MATERIALS

- Procedure basin;
- Saline 0.9%;
- Degerming chlorhexidine;
- Sterile compress;
- Sterile gauze;
- Sterile glove;
- 70% alcohol or alcoholic chlorhexidine;
- Pink needle (40 x 1.2 mm);
- 1 ml syringe + needle (13 x 4.5 mm);
- 2% injectable lidocaine without vasoconstrictor;
- Medication(s) of choice (hyaluronic acid and/or corticoid);
- 3 ml syringe  or hyaluronic acid/corticoid manufacturer syringe;
- Sticking plaster (4 to 5 cm);
- Crepe bandage (06 cm x 1.8 m).

## SAFETY WARNINGS

There is no need for hospitalization to perform the procedure, but the doctor might be supported by a nurse or nursing technician responsive to manage sterile material at the doctor´s office. Appropriate material use and the maintenance of ambient sterility are essential efforts to avoid infection.

It is important to analyze X-rays of lateral view of the hindfoot, antero-posterior view of the foot with load and Broden´s view. The analysis of foot and ankle radiographs is necessary to confirm whether there is sufficient joint space to perform intra-articular injection. Considering that arthrosis reduces joint space, it would turn the procedure painful or unfeasible.

There is no need that intra-articular injection procedure to be image-guided. Specially for lateral access, the anatomical landmark is sufficient to guide intra-articular injection.

The anatomical shape of the joint is peculiar; however, it might not offer resistance to needle insertion. If there is resistance, the needle should be withdrawn and reinserted to promote the drug application more comfortable for the patient.

In case of reaction to the medication, the treatment must be stopped.

BEFORE START INSTRUCTIONS

In a medical consultation previously to the procedure day, the patient might receive counseling regarding the benefits of intra-articular injections, information about the protocol scheme and the average duration of the medication effects. Beyond that, the patient should be warned about the risks of the treatment.

## Patient preparation and positioning

1 Wash the patient's foot with degerming chlorhexidine and saline solution abundantly using a basin to store the liquid;

2 Dispose of the washing liquid in a suitable place;

3 Dry the patient's foot with a sterile compress;

4 Place the patient in lateral decubitus, with ipsilateral knee flexion between 80 and 90°;

5 Position the contralateral knee flexed at 45°;

6 Place the adipose cushion in the patient's ipsilateral medial malleolus region to promote subtalar inversion;

7 Wear sterile gloves;

8 Perform asepsis with sterile gauze and 70% alcohol or alcoholic chlorhexidine at the infiltration site;

## Local anesthesia

9 Palpate the tip of the lateral malleolus;

10 Apply 1 ml of lidocaine to the skin and subcutaneous tissue slightly anterior to the lateral malleolus in various directions, according to the region marked in red (Figure 1A), after aspirating the syringe, making sure it is not inside a blood vessel;


11 Make circular movements with a gauze, performing compression at the application site, to spread the anesthetic and stop the bleeding;

## Medication preparation

12 Gently mix and aspirate the medication (hyaluronic acid and/or corticoid) directly from the manufacturer's vial(s);
For the subtalar joint, isolated drug administration usually composes a 2ml injection. However, the combined hyaluronic acid and corticoid maximum volume must not exceed 4 ml (Table 1

at *Guidelines & Warnings*).

## Subtalar intrarticular injection

13 Palpate the tip of the lateral malleolus again to confirm the position where the intra-articular injection will be performed;

14 Introduce the needle attached to a 3 ml syringe in the region marked in the site pointed in red or use the needled syringe supplied by the manufacturer containing hyaluronic acid or its association with corticoid, directing the needle towards the posterior facet (Figure 1B). The needle angle of attack is 90°, but it may be necessary to change angle to find the joint cleft, considering that some patients have significant narrowing or deformity of the bone contour. Assessing radiography before the procedure is very important. The content must enter without resistance and discomfort for the patient. If this does not happen, remove the needle, reposition it, and reinsert it again following the same procedure;


15 After applying all the contents, remove the needle and compress the site with gauze for about two minutes to stop the bleeding and reduce the formation of a hematoma;

16 Perform inversion and eversion movements in the subtalar to spread the medicine.