



Department of Radiology
UNIVERSITY OF WISCONSIN
SCHOOL OF MEDICINE AND PUBLIC HEALTH

Musculoskeletal Imaging and Intervention Section Procedures
Glenohumeral Corticosteroid Injection and Arthrography

INDICATIONS

- Contrast injection for MR arthrogram – typically ordered for evaluation of a labral tear.
- Diagnostic anesthetic injection – ordered in patients with typically both cervical spine and glenohumeral joint disease to differentiate the pain generator. May be combined with steroid to constitute a therapeutic injection.
- Aspiration to rule out septic arthritis, including periprosthetic.

RISKS

- Bleeding
- Infection
- Pain

MODALITY

- Fluoroscopy

PRE-OPERATIVE WORKUP

- Informed consent

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MATERIALS

- Alcohol, ChloroPrep applicator, sterile drape
- 10 mL syringes for skin anesthetic and steroid/anesthetic mixture
- 5 mL syringe for Omnipaque 300 (5 mL)
- 20 mL syringe for arthrogram mixture
- 1% lidocaine (for skin numbing); buffered with 8.4% sodium bicarbonate
- 1 mL triamcinolone acetonide (Kenalog 40 mg/mL)
- Ropivacaine HCL 0.5% (Naropin 5 mg/mL)
- 1% preservative-free lidocaine HCL (10 mg/mL)
- Dotarem (Gadoterate Meglumine 0.5 mmol/mL)
- Preservative-free normal saline
- 30G 0.5", 22G 1.5" & 3.5" needles

TECHNIQUE

1. Place the patient supine with their arm at their side, hand supinated with a sandbag placed in their palm. Be sure not to excessively externally rotate the shoulder, as the anterior capsular ligaments will be pulled taut, thereby reducing the joint space.
2. The skin entry site will be in the upper medial region of the humeral head, within the rotator interval. This is to avoid the supraspinatus, subscapularis, and long head of the biceps tendon. Be sure to mark a few millimeters lateral to the medial articular surface to avoid penetrating the labrum. A good landmark in the craniocaudal axis is to stay within the borders of the coracoid.
3. Prep and drape as per usual and perform local anesthesia.
4. MR arthrogram or therapeutic injection:
 - a. Place the tip of the 22G 1.5" or 3.5" (if needed) needle directly down to the cortex at the marked skin entry site.
 - b. Confirm intra-articular needle tip placement with a small injection of Omnipaque 300 (or arthrogram mixture containing Omnipaque). Save the image.
 - c. Inject:
 - i. MR arthrogram – 12 mL of the standard dilute gadolinium solution (10 mL 1% preservative-free lidocaine, 5 mL Omnipaque 300, 5 mL 0.9% preservative-free NaCl, and 0.1 mL Dotarem).
 - ii. CT arthrogram – Inject 12 mL of a mixture containing 10 mL 1% preservative-free lidocaine and 10 mL Omnipaque 300.
 - iii. Therapeutic injection – Inject 5 mL of a mixture containing 1 mL Kenalog, 2 mL 1% preservative-free lidocaine, and 2 mL ropivacaine HCL 0.5%. If combining with an MR arthrogram, waste 1 mL of 12 mL of the standard gadolinium mixture and add 1 mL Kenalog.



Fig 1. Frontal fluoroscopic image of the left shoulder demonstrating proper needle placement within the rotator interval and iodinated contrast within the joint space.



Fig 2. Frontal fluoroscopic image of the left shoulder demonstrating dilution of contrast within the joint space, extending within the subscapularis recess.



Fig 3. Frontal fluoroscopic image of the left shoulder demonstrating proper needle placement within the rotator interval and a trace amount of iodinated contrast within the joint space.



Fig 4. Frontal fluoroscopic image of the left shoulder demonstrating dilution of contrast within the joint space, as evidenced inferior and posterior to the bony glenoid.

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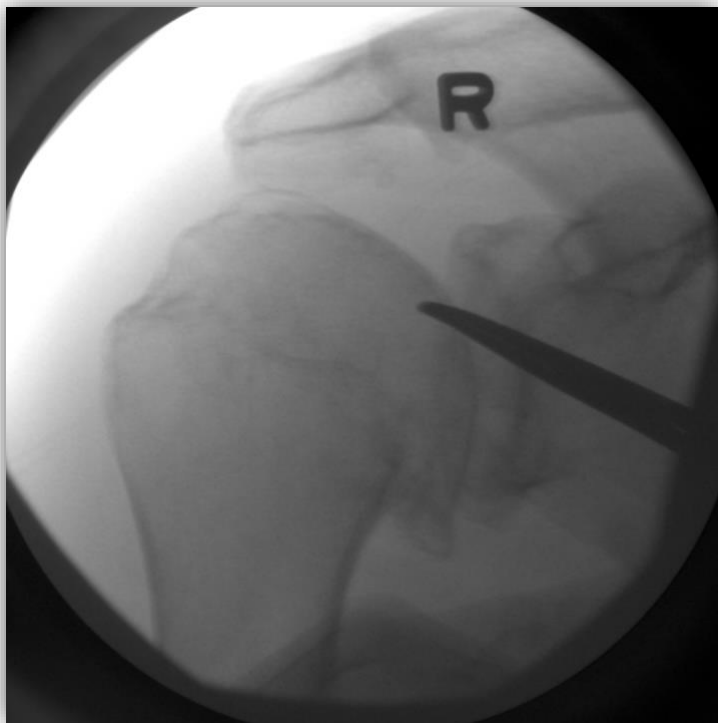


Fig 5. Frontal fluoroscopic image of the right shoulder demonstrating forceps placement for skin marking within the rotator interval.



Fig 6. Frontal fluoroscopic image of the right shoulder demonstrating proper needle positioning with intra-articular contrast extending within the subscapularis recess.



Fig 7. Frontal fluoroscopic image of the left shoulder demonstrating proper needle tip positioning within the rotator interval.



Fig 8. Frontal fluoroscopic image of the left shoulder demonstrating flow of iodinated contrast within the joint space.

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