Sacroiliac Intra Articular Joint Injection

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Abstract

The sacroiliac joints (SIJs) are large bilateral synovial-fibrous joints located between the articular surfaces of the sacrum and ilium. The role of the SIJ is to provide stability to and absorb forces from the spine and lower extremities. SI dysfunction is often seen with conditions that asymmetrically load the hip such as limb length discrepancy and arthritis, with pregnancy, or simply with age related degeneration. Pain presents as low back pain that can radiate to the buttock and thigh.

The SIJ capsule is supported by the interosseous sacroiliac ligament as well as several muscles including the gluteus maximus, gluteus medius, erector spinae, biceps femoris, piriformis, transversus abdominus, and thoracolumbar fascia making it a highly stable but poorly mobile joint. The SI joint is thought be primarily innervated by some combination of L4–S3 and the superior gluteal nerve (Cox and Fortin, Pain Physician 17(5):459–464, 2014; Roberts et al., Reg Anesth Pain Med 39(6):456–464, 2014).

SI joint injections are indicated to diagnose pain originating from the SI joint as well as treat SI joint pain refractory to conservative treatment with oral anti-inflammatories or physical therapy. Typically, a diagnostic injection is performed if three or more provocative tests such as FABER, pelvic compression, or Gaenslen's test are positive (Newman and Soto, Am Fam Physician 105(3):239–245, 2022).

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After positive diagnosis of SI joint pain, a SI joint radiofrequency ablation (RFA) can provide long-lasting pain relief. This minimally invasive procedure interrupts nociceptive pain signals from the L5 dorsal ramus and the lateral branches of the S1, S2, and S3 nerve roots (Pastrak et al., Curr Pain Headache Rep 26(11):855–862, 2022). Techniques include conventional RFA, cooled RFA, bipolar RFA, pulsed radiofrequency denervation, and intra-articular pulsed radiofrequency.

Keys to Procedure

- Understand the relevant SI joint anatomy on AP and oblique view.
- Understand how to safely advance needle in order to enter SI joint space.
- Understand the complications and corrective steps if encountered.

Anatomy Pearls

See Images 11.1 and 11.2.

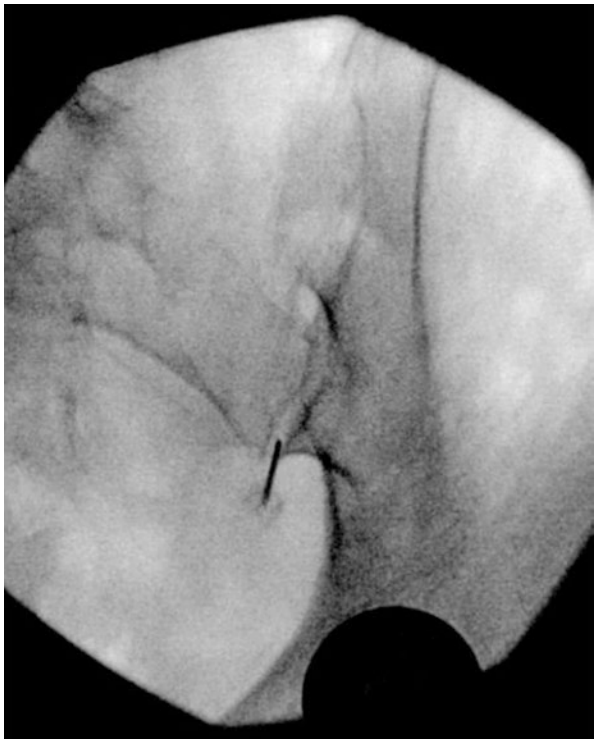

Image 11.1 Needle entry into infero-posterior SI joint

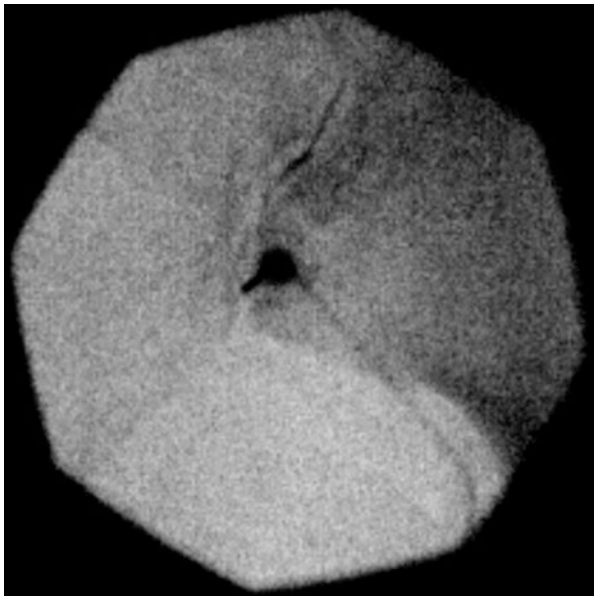

Image 11.2 AP view of contrast outlining SI joint

What You Will Need

- Sterile towels.
- Chlorhexidine-based soap.
- 22G 3.5″ or 25G 3.5″ spinal needle.
- Lidocaine 1% for skin–5 mL (if using 22G spinal needles).
- Isovue 300–3 mL.
- Bupivacaine 0.25%–2 mL.
- Dexamethasone 10 mg–1 mL.
- 25G 1.5″ needle for skin local.
- 18G 1.5″ needle to draw up medications.
- Extension tubing (3″) for contrast.
- 5 mL syringe with 25G 1.5″ needle for skin local (if using 22G spinal needles).
- 3 mL syringe with tubing for contrast.
- 3 mL syringe for injectate (2 mL Bupivacaine + 1 mL dexamethasone 10 mg).
- If bilateral SI joint injection—2 mL Bupivacaine 0.25% and dexamethasone 10 mg for each side.

Patient Positioning

– Prone with pillow under pelvis to help with anatomic visualization.

How to Perform the Procedure

1. Sterilely prep and drape with sterile towels.
2. Obtain a true AP view of the pelvis to visualize the targeted SI joint.

3. To obtain the best image of the posterior SI joint, tilt the C-arm 10–15° cephalad to elongate the posterior plane of the joint and oblique the C-arm 10–20° contralateral to optimize the inferior region of the joint. Target for needle is along the inferior, posterior aspect of the joint, approximately 1–2 mm cephalad of the joints most inferior end (Image 11.1).
4. Anesthetize the skin with Lidocaine 1% (if using a 22G spinal needle) and insert the spinal needle coaxial to the fluoroscopic beam.
5. Advance needle until the needle is felt to enter the joint (similar to the feeling of a needle in an eraser).
6. Obtain a fluoroscopic view to verify the needle tip in the joint between the ilium and sacrum on fluoroscopy.

7. Administer 0.5–1 mL of contrast to ensure the contrast outlines the joint space (Image 11.2).
8. Administer injectate (2 mL Bupivacaine + 1 mL dexamethasone 10 mg) slowly.
9. Remove needle, clean site, and place adhesive dressing.

Checkpoints to Mastery

Beginner

- Oblique fluoroscope ipsilaterally to open inferior portion of the SI joint.
- Visualize the anterior and posterior aspects of the SI joint.

Intermediate

- Aim and advance needle towards inferior aspect of the medial joint space, corresponding to the posterior SI joint.
- Advance until needle felt to be firmly within the joint.

Advanced

- Visualize both the anterior and posterior aspects of the SI Joint upon injection of contrast.

Pitt Pain Pearls and Pitfalls

- Some physicians may not use contrast to confirm placement, but it does provide verification of accuracy of injection.
- If the needle tip touches periosteum near the joint space, the best method is to walk off the side of the sacrum or ilium, which should guide the spinal needle into the joint space.
- If resistance is felt while injecting, slowly rotate the needle bevel while maintaining gentle pressure to improve flow. If there is still resistance, the needle may still be in ligament and can be slowly advanced 1–2 mm.

References

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4. Pastrak M, Vladicic N, Sam J, Vrooman B, Ma F, Mahmoud A, Khan JS, Abd-Elsayed A, Khandwalla F, McGilvray S, Visnjevac O. Review of opioid sparing interventional pain management options and techniques for radiofrequency ablations for sacroiliac joint pain. Curr Pain Headache Rep. 2022;26(11):855–62. https://doi.org/10.1007/s11916-022-01088-w.

Further Reading

Sacroiliac Intraarticular Joint Injection, Atlas of Image-Guided Spinal Procedures, 2nd Edition, Furman.