A Dual-Needle Fluoroscopic Technique for Middle Third Sacroiliac Joint Access: A Technical Report

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Abstract

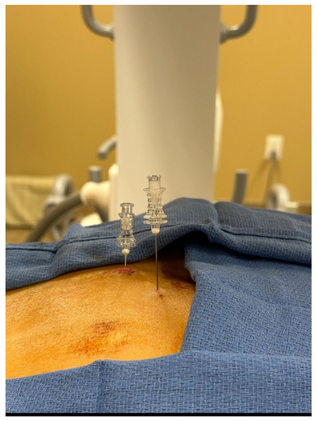
- The sacroiliac joint (SIJ) is a well-recognized source of chronic low back pain.
- Despite it being a large joint, it remains difficult to enter due to variations in anatomy, and difficulty in precise visualization under fluoroscopy.
- Traditional single-needle approaches often target the inferior third of the joint but may not provide sufficient therapeutic coverage particularly when the medicine doesn't spread to the middle third of the SIJ.
- This technical report describes the dual needle technique, to enhance ease and accuracy in accessing the middle third of SIJ.

Introduction

- The SIJ is known to be the source of pain in 10% to 27% of chronic low back pain and as a result affects the functional aspect of patients.
- Dysfunction at the SI stems from conditions such as inflammatory arthritis, pregnancy, trauma, and previous spine surgery.
- Due to its deep anatomical location and complex articular structure, accurate intraarticular needle placement and therapeutic injection remains challenging for pain specialists.
- Traditionally, fluoroscopy-guided procedures involve the insertion of a single needle into the inferior third of the SI joint. However, with novel SI joint posterior fusion techniques it is important to access the middle third of the SI joint.

Technical Report

- The patient is positioned prone with a pillow under the abdomen to reduce lumbar lordosis.
  SIJ area is prepped with an antiseptic solution and sterile drapes are applied.
- Fluoroscopic guidance is used in AP projection, and obliqued (0° - 10° degrees) away from the side of the SIJ to align posterior and anterior joint lines over the inferior third of SIJ.
- A 3.5-inch Quincke-tip spinal needle is placed, under fluoroscopic guidance, into the inferior third of the SIJ. The first needle is then the left in place as a radiographic marker.
- The C-arm fluoroscopy is then obliqued further between 25 to 35 degrees to visualize the posterior joint line intersecting the anterior joint line at the middle of the SIJ.
- With first needle as a point of reference in the posterior joint line, a second 3.5 inch
  Quincke spinal needle is advanced and aimed towards the posterior joint line at the middle third of the SIJ.
- Pulse or Real-time dynamic fluoroscopy may then be employed to confirm that the second needle indeed enters the joint space through different angles.



Procedural setup

- Prone positioning, C-arm fluoroscopy, sterile field, and dual-needle access approach.
- After confirming intra-articular needle placement in both AP and oblique angles, a contrast medium is injected to ensure intra-articular location and to visualize joint and intraosseous spread (middle needle).

Selected Fluoroscopic Images

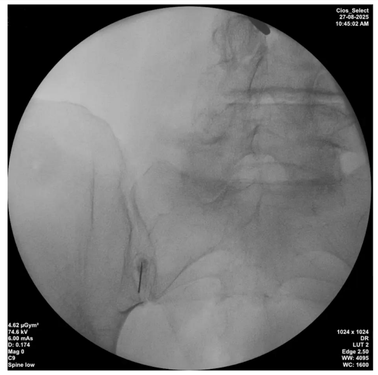


Figure 1
Fluoroscopic anteroposterior view with left SI joint approx. 5-degree oblique to the right showing initial placement of a 3.5-inch Quincke-tip spinal needle into the inferior third of the right sacroiliac joint. This needle acts as a radiographic landmark to outline the posterior joint line before obliquation of the C-arm.



Figure 2
Oblique fluoroscopic with approximately 30 degree left oblique view revealing middle of the sacroiliac joint. The first needle marks the posterior joint line, making it easier to visualize the middle of the joint and delineating the posterior opening.



Figure 3
Lateral fluoroscopic view displaying both needles in place.

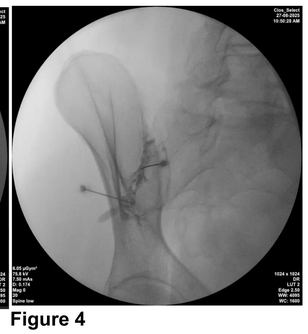


Figure 4
Anterior posterior fluoroscopic view demonstrating intra-articular contrast spread from both needles

Discussion

- The SIJ represents unique anatomical and procedural challenges for accurate intra-articular injection.
- Its complex articular surface and variable orientation can obscure fluoroscopic landmarks, particularly when targeting the difficult-to-access middle third using traditional single-needle approaches.
- The dual-needle technique addresses these issues by using a first needle as a landmark in the inferior third, preserving spatial orientation even when conventional radiographic landmarks diminish.
- Dynamic fluoroscopy may be used- it allows real-time assessment of needle trajectory across changing angles and confirms intra-articular needle placement prior to contrast injection.
- Although dual needling may add procedural time initially and requires operator skill, it may ultimately reduce failed attempts and enhance procedural success.

Conclusion

- Sacroiliac joint injection remains a technically demanding procedure due to complex joint anatomy and variable fluoroscopic visualization, particularly the middle third of the joint.
- It is important to be able to enter the middle third of the joint reliably especially for the novel posterior joint fusion procedures.
- The dual-needle technique described in this report offers a practical and reproducible solution for improving middle third joint access under dynamic fluoroscopy.
- By using the first needle as a radiographic landmark, this method enhances spatial orientation and facilitates precise placement of the second needle into the intra-articular space.

References

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