Observational Study

Fluoroscopic Sacroiliac Joint Injection: Is Oblique Angulation Really Necessary?

Sandeep Khuba, MD, Anil Agarwal, MD, Sujeet Gautam, MD, and Sanjay Kumar, MD

From: Sanjay Gandhi Post Graduate Institute of Medical Sciences, India

Address Correspondence: Sandeep Khuba, MD Sanjay Gandhi Post Graduate Institute of Medical Sciences, Rae Bareli Road, Lucknow, Uttar Pradesh 226014, India E-mail: sandeepkhuba@gmail.com

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Background: The conventional technique for sacroiliac (SI) joint injection involves aligning the anterior and posterior aspects of the SI joint under fluoroscopic guidance and then entering the SI joint in the most caudal aspect.

Objective: We wish to highlight that there is no added advantage to aligning both the anterior and posterior joint lines of the SI joint as it is time consuming, associated with additional radiation exposure, and may make the entry into the posterior SI joint technically more difficult.

Study Design: Observational study.

Setting: Pain Clinic, Department of Anesthesiology.

Methods: With the patient lying prone on fluoroscopy table, SI joint injection is performed with a 22 G, 10 cm spinal needle in a true anteroposterior (AP) view, where anterior and posterior SI joint spaces are seen as separate entities, where the medial joint space represents the posterior SI joint and the lateral joint space represents the anterior SI joint. The distal 1 cm of the medial joint space is entered under AP view. If the SI joint is seen as a straight line rather than 2 joint spaces in the AP view then the image intensifier of the fluoroscope was tilted cranially to elongate the image of the lower part of the posterior SI joint, thus facilitating entry into this part of the joint which was confirmed by administering 0.3 to 0.5 mL of radiopaque contrast medium.

Result: Sixty SI joints of 58 patients were injected under an AP fluoroscopic view. Forty-two (70%) SI joints were seen as 2 separate medial and lateral joint spaces and were entered in distal 1 cm of the medial joint space. In 18 (30%) joints seen as a straight line rather than 2 separate spaces, the image intensifier of the fluoroscope was tilted cranially to elongate the image of the lower part of the posterior SI joint and then the SI joint was entered in its distal 1 cm. Confirmation of entry into the SI joint was confirmed by with 0.3 to 0.5 mL of radiopaque contrast medium. In 4 cases the joints did not show the correct radiopaque contrast spread (3/42 and 1/18) although the needle seemed to be in the joint space.

Limitations: Small sample size.

Conclusion: Aligning the anterior and posterior aspects of SI joint for fluoroscopic guided SI joint injection is not necessary for the success of the block.

Key words: Sacroiliac joint, injection, anteroposterior view, oblique angulation, fluoroscopic technique

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Sacroiliac (SI) joint dysfunction is a cause of 10% to 25% of low back pain (1,2). Intraarticular steroid injection is advocated for treatment of SI joint dysfunction (3). The SI joint is an auricular shaped joint with its joint axis oriented in a medial to lateral direction from posterior to anterior. Because of this specific tortuous course, access to this joint for injection is difficult. The conventional technique of SI joint injections dictates aligning the anterior and posterior aspect of the joint under fluoroscopic guidance by giving 10 to 20 degree of oblique angulation on the affected side. This leads to visualization of the anterior and posterior joint as a single line, and thereafter it is entered in its lower part (4,5). At times however it becomes difficult to perfectly align the anterior and posterior joint. Thereafter correct needle placement is confirmed by injecting a radiopaque contrast medium into the joint. But sometimes with the conventional technique it may result in incorrect dye spread into the joint (6). In this technical report we wish to highlight that the SI joint could be entered with ease and injected in the anteroposterior (AP) fluoroscopic view without needing any oblique angulation.

Methods

Sixty SI joints of 58 patients (32 men, 26 women) from January 2015 to October 2015 were injected in the AP fluoroscopic view after taking informed consent of the patients. The mean age of patients was 43.7 years (range 21 – 75 years). Thirty patients were injected on the left side and 26 patients on right side, and 2 patients were injected bilaterally.

Technique of SI Joint Injection

All the patients were positioned prone on the operating table, the sacroilliac joint area is prepared with povidine iodine and sterilely draped All injections were given by the same physician and fluoroscopy technician to remove operator bias. The same technical protocol was followed for all patients. First an AP image of the respective SI joints was taken. If the AP image showed the anterior and posterior joint spaces as separate lateral and medial joint lines, respectively (Fig. 1), then the lower part of medial joint line was entered with a 22 G, 10 cm spinal needle under a gun barrel view with the fluoroscope (Fig. 2). The distal end of the spinal needle was slightly bent so as to facilitate easy manipulation of the needle into the joint space. If the SI joint was seen as a straight line rather than 2 joint spaces in the AP view (Fig. 3) then the image intensifier of the fluoroscope was tilted cranially to elongate the image of the lower part of the posterior SI joint thus facilitating entry into the posterior SI joint space. This was confirmed by administering 0.3 to 0.5

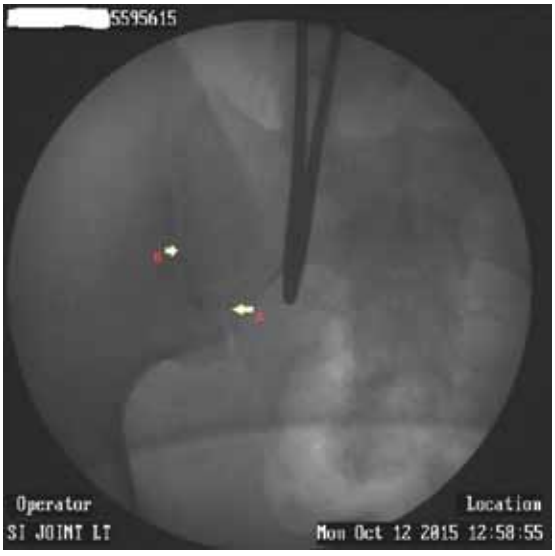

Fig. 1. AP view showing separate A) posterior joint and B) anterior joint.

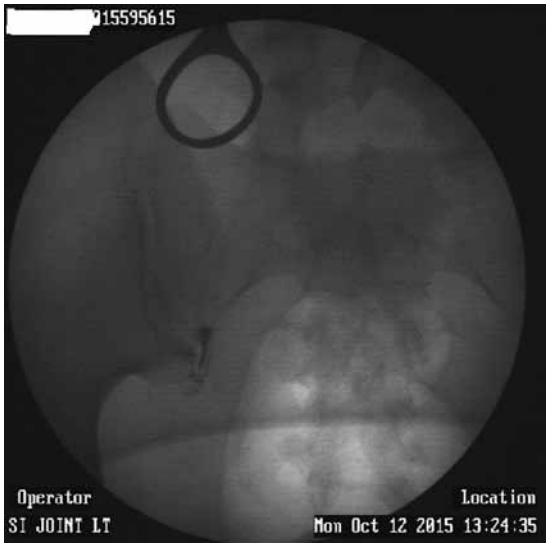

Fig. 2. Needle with contrast in SI joint.

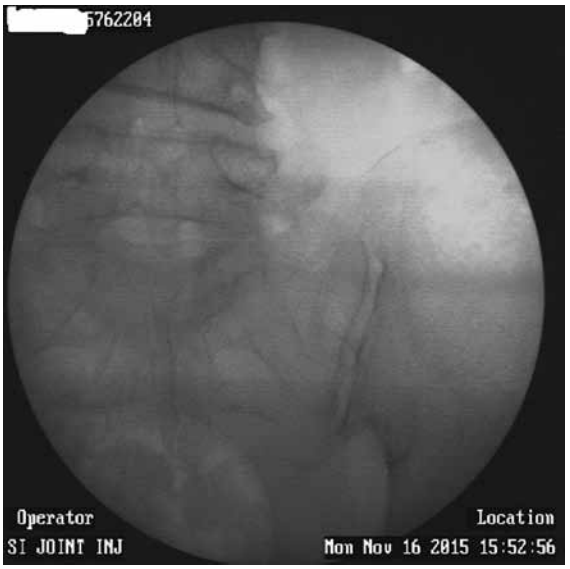

Fig. 3. SI joint seen as single in AP view.

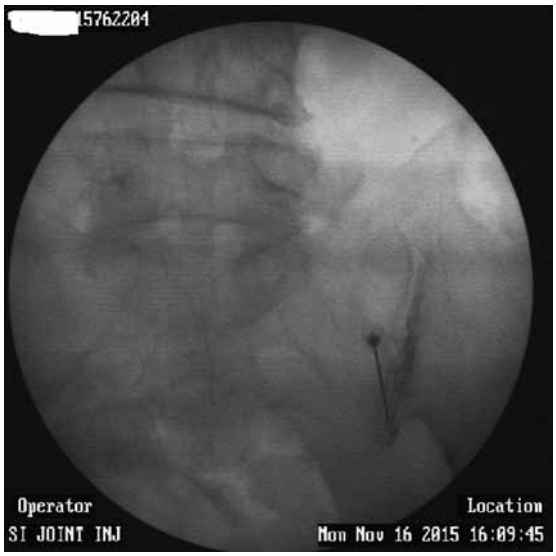

Fig. 4. Needle with contrast in AP view.

mL of radiopaque contrast medium (omnipaque 240) and seeing contrast flow in the superior or anterior part of the joint (Fig. 4). Following confirmation of the dye in the SI joint, 20 mg of triamancinolone in 1 mL of 1% lidocaine was administered into the joint. All patients were observed in the post-operative area for 30 minutes for any complication.

Results

Forty-two (70%) SI joints could be seen as 2 separate medial and lateral joint spaces and were entered in the lower part of the medial joint space. In 18 (30%) SI joints, seen as a straight line rather than 2 separate spaces, the image intensifier of the fluoroscope was tilted cranially to elongate the image of the lower part of the posterior SI joint and thereafter the SI joint was entered in its distal 1 cm. Confirmation of entry into the SI joint was done by administering 0.3 to 0.5 mL of radiopaque contrast medium. In 4 patients the SI joints did not show correct radiopaque contrast spread (3/42 and 1/18) although the needle seemed to be in the joint space.

Discussion

The SI joint is a large, auricular shaped and diarthrodial synovial joint. Because of the complex anatomy of the joint, it is very difficult to enter into the joint blindly or even under fluoroscopic guidance. Various techniques have been proposed for injection of the SI joint (7-11). In the true AP image, the medial joint space represents the posterior SI joint and the lateral joint space represents the anterior SI joint space. In the conventional technique, the posterior SI joint is entered in the most distal 1 cm after aligning its anterior and posterior joint lines under fluoroscopic guidance (4,5). In the conventional technique, alignment of anterior and posterior joint lines was advocated by authors because that gave them a better 3-dimensional perspective of the joint during the selection of the trajectory of the needle. The authors also stated that the most difficult part of their procedure was locating the SI joint space (4).

We are of the opinion that when we have to inject in the posterior SI joint there is no reason to align the anterior and posterior SI joint lines. Liliang et al (11) reported that if the SI joint could not be injected with the conventional technique then separating the SI joint could be helpful in achieving a successful joint injection.

In that case we see no justification for aligning the anterior and posterior joint lines of the SI joint and then entering the posteroinferior part of the SI joint only to then adjust the fluoroscope medially or laterally until the posterior and anterior joint lines are separated if

that fails. If the posterior SI joint space is visible (medial joint line) as a separate space apart from its anterior joint space (lateral joint line) then one should enter into its posteroinferior space straight away.

However in some patients in an unadjusted anterior posterior radiograph view the SI joint is seen as a single joint space rather than 2. In these patients, tilting the image intensifier of the fluoroscope cranially has been reported to displace the posteroinferior portion of the SI joint in a caudal direction, thus allowing it to be clearly differentiated from the inaccessible anterior aspect of the joint, which moves in the cephalic direction (7). So in cases where the SI joint was seen as a straight line rather than 2 joint spaces in the AP view, we obtained the radiological view after tilting the image intensifier of fluoroscope cranially.

In our clinical experience we have seen that in 70% of the cases, the anterior and posterior parts of SI joints are separately visible as lateral and medial joint lines in the AP view respectively, then entering into the medial joint line increases the chances of accessing the joints accurately. In 30% of the cases the SI joint is visible as a straight line. So if the SI joint is visible as a straight line on fluoroscopic image then tilting the fluoroscope cranially enhances the chances of entering into the joint.

In 4 SI joints we could not get the correct contrast spread although the needle seemed to be in the joint in the AP, medial, or lateral angulation view of the respective SI joints. This may have been caused by the presence of osteophytes and degenerative changes in the joint.

The only limitation of the proposed technique is that sometimes the joint margins are not sharp and discrete; however, the joint space is clearly visible and can be accessed.

In our clinical experience we were able to inject 93.3% of SI joints in the AP view only with a slight cranial angulation of the fluoroscope if the SI joint was seen as a single line. We observed that this technique required less radiation exposure along with the added advantage of being less time-consuming and easier to perform as compared to the conventional technique.

Conclusion

If anterior and posterior SI joints are visualized separately in a true AP view then one should enter in the distal 1 cm of the posterior joint space without aligning the 2 joint spaces. If the SI joint is visible as a straight line, we suggest one should obtain a radiological view after tilting the image intensifier of the fluoroscope cranially and the needle should be advanced perpendicular to the fluoroscopy table.

The SI joint could be injected successfully in the AP view only without an oblique angulation of the fluoroscope.

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