Small Joint Injections

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Indications. Foot/ankle: Diagnostic injection to confirm the site of pain if not clinically apparent particularly in patients with hindfoot pain/instability; therapeutic injections for post-traumatic arthritis, osteoarthritis, and inflammatory arthritis; and presurgical diagnostic and therapeutic injections to aid in surgical planning of arthrodesis or ligamentous reconstruction. Sternoclavicular joint: diagnostic and therapeutic injection for nonsurgical management of degenerative disease).

Equipment/Materials: Fluoroscopy or CT, 25–22 g needles, short-acting local anesthetic, iodinated contrast material, and corticosteroid.

Procedure

Foot/Ankle

1. Patient positioning: Tibiotalar (Fig. 101.1a) and posterior subtalar joints (lateral decubitus with affected ankle upward); talonavicular, naviculocuneiform, and tarsometatarsal joints (Fig. 101.1b) (supine, knee flexed, and foot on small-angled wedge); and metatarsophalangeal joints (supine, knee bent, and foot flat on fluoroscopy table).
2. Palpate and mark the dorsalis pedis artery except for MTP joint injections.
3. Adjust C-arm angulation to adequately visualize the joint space.
4. Place radiopaque marker at the skin entrance site using intermittent fluoroscopy. Avoid the Achilles tendon for subtalar joint injection and the extensor hallucis longus tendon for MTP joint injection.
5. Following skin and subcutaneous tissue local anesthetic infiltration, advance 22 g needle into the joint space (use 25 g needle for TMT, intertarsal and MTP injection).
6. Once in the joint space or on the bone, inject minimal amount of local anesthetic to check for loss of resistance, followed by minimal amount of iodinated contrast material to document intra-articular location (Fig. 101.1).
7. Save this image and administer the injectate. Note dilution of the intra-articular contrast and save this final image.
8. Document pre-procedure and post-procedure pain score.

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Sternoclavicular Joint

1. Patient is positioned supine on the CT table.
2. Place the CT biopsy grid over the affected joint.

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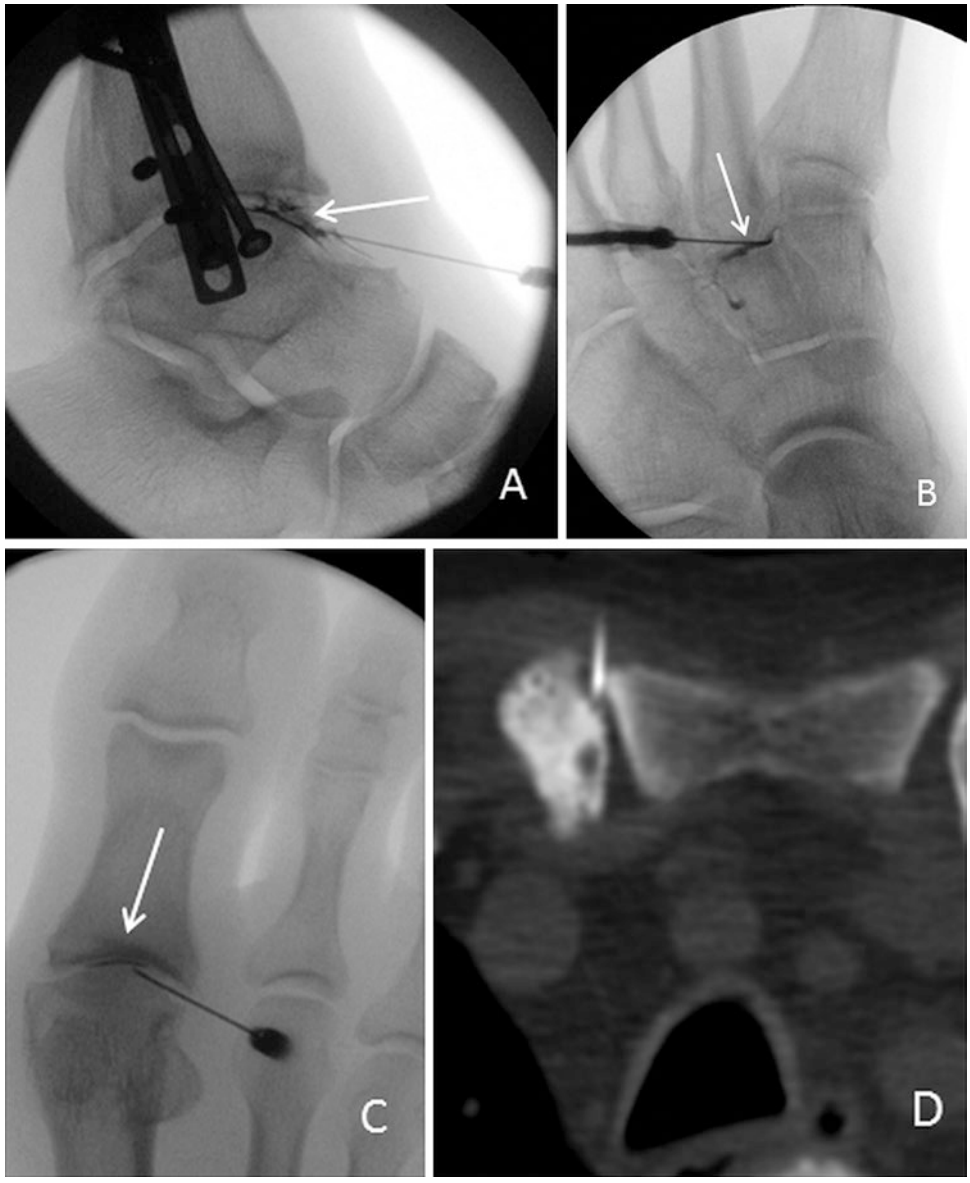

Fig. 101.1 Examples of small joint injections. (**a**–**c**). Fluoroscopic-guided injection of the tibiotalar joint (**a**), second tarsometatarsal joint (**b**), and first MTP joint (**c**) demonstrating iodinated contrast material within these joints (*arrows*). (**d**). CT-guided injection of the right sternoclavicular joint shows needle placement within the right SC joint

3. Place a CT grid, acquire CT images through the affected joint, and identify a suitable skin entrance site avoiding blood vessels.
4. Use a 22 g needle to advance into the SC joint utilizing intermittent CT guidance.
5. Inject minimal amount of iodinated contrast material to document intra-articular location followed by corticosteroid and short-acting anesthetic agent (Fig. 101.1d).
6. Document pre- and post-procedure pain score.

Complications: For small joint injections, bleeding, infection, and reaction to contrast medium are the typical complications.

Meticulous sterile technique is recommended to reduce risk of infection. For sternoclavicular joint injections, major bleeding and lung injury (pneumothorax) are possible complications due to the joint's proximity to the mediastinum and lung. Additionally, for any intra-articular steroid injection, postinjection synovitis flare reaction can be seen. A steroid flare presents as severe pain, swelling, and possibly redness of the injected joint. It is self-limiting and resolves in 2–5 days. Treatment is symptomatic with rest, ice, and NSAIDs.

Pearls: Review available imaging prior to the procedure to help guide access to the joint. CT guidance may be necessary for severely narrowed or hypertrophic joints. For patients with documented iodinated contrast reaction, intra-articular gadolinium and air are two alternatives. For small midfoot and MTP joints, we suggest injecting 20 mg of Depo-Medrol (40 mg/mL), 40 mg of Depo-Medrol (40 mg/mL) for tibiotalar and subtalar joints, and 60 mg of Depo-Medrol (40 mg/mL) for sternoclavicular joint. 1–2 mL of 1% Lidocaine is the suggested dose for long-acting anesthetic. Educate the patient at the time of injection to expect the anesthetic to wear off in 4–6 h and corticosteroid to be effective starting at 24–48 h postinjection.

Additional Reading

Berthelot JM, Goff BL, Maugars Y. Side effects of corticosteroid injections: what's new? Joint Bone Spine. 2013;80(4):363–7.

Masala S, Fiori R, Bartolucci DA, et al. Diagnostic and Therapeutic Joint Injections. Semin Intervent Radiol. 2010;27(2):160–71.