Lumbar Spine Facet Block (Ultrasound-Guided and X-Ray Fluoroscopy-Guided)

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78.1 Introductions

78.1.1 Overview

Facet joint is one causative mechanism in the etiology of low back pain. Facet joint blocks have long been used in the diagnosis and management of spinal pain syndrome. Osteoarthritis of the spine is ubiquitous and an inevitable part of aging. The degenerative cascade that leads to degeneration of the intervertebral discs causes progressive disc dehydration and loss of disc height. Disc degeneration leads to increased mobility of adjacent vertebrae and increased shear forces in the facet joints themselves. These problems may manifest clinically as ill-defined back pain that radiates into the hips, buttocks, and thighs in a non-dermatomal pattern [1, 2]. An understanding of facet-related pain syndromes and the methods for placing medication directly within the facet joint proves useful.

78.2 Indications

Lumbar spine facet block using the intra-articular technique is indicated primarily as a diagnostic maneuver to prove that a specific facet joint is in fact the source of pain. Lumbar spinal fact block is suitable for most clinical applications, including the treatment of painful conditions involving trauma, arthritis, or inflammation of the lumbar spinal facet joints.

78.3 Anatomy

The lumbar spine facet joints are paired diarthrodial synovial joints formed by the inferior articular process of one vertebra and the superior articular process of the subjacent vertebra (Fig. 78.1). A tough fibrous capsule is present on the posterolateral aspect of the facet joint. It is composed of several layers of fibrous tissue and a synovial membrane, separated by a layer of loose areolar tissue. The synovium and joint space normally extend a variable distance along the superior or inferior articular process and under the capsule. There is no fibrous capsule on the vertebral aspect of the joint. Instead, in its place, there exists the ligamentum flavum, which is in direct contact with the synovial membrane. The adipose tissue in the superior recess of the facet joint is in direct contact with the adipose tissue surrounding the spinal nerve, thereby providing a direct route to the epidural space. In fact, owing to the small

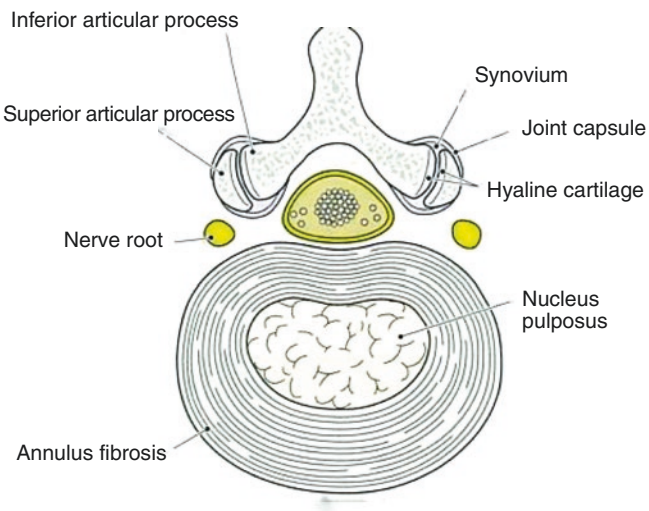

Fig. 78.1 Horizontal anatomical aspect of lumbar facet joints

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volume of the lumbar facet joint space, approximately 1.0–2.0 mL, volumes of therapeutic agent in excess of this amount may extravasate into the epidural space by this route (Fig. 78.1).

The lumbar facet joints are angled with a somewhat oblique orientation, allowing for flexion, extension, and rotation that is greater than that in the thorax but less than in the cervical region (Fig. 78.2).

78.4 Instruments and Drug Solutions

1. Needle: 6 cm 23-gauge needle or 23-gauge spinal needle, 18-gauge drawing needle
2. 1% mepivacaine, dexamethasone
3. Iodinated contrast (under the fluoroscopy)
4. 20-gauge needle (under the ultrasound-guided)

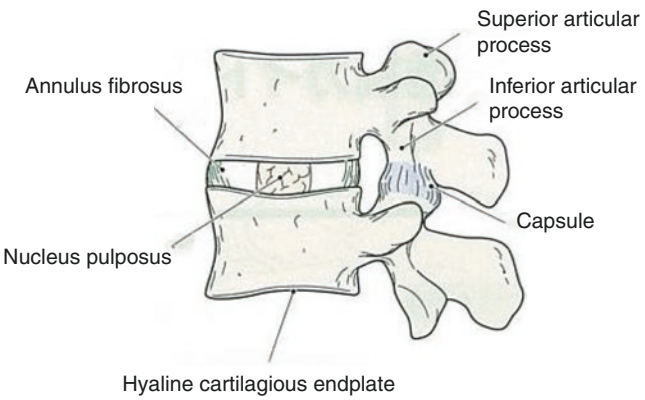

Fig. 78.2 Sagittal diagram depicting the components of the lumbar facet joint

78.5 Procedures and Techniques

78.5.1 Ultrasound-Guided Method

The patient is placed in the prone position, and a low-frequency curvilinear transducer is used. First, a longitudinal midline sonogram is obtained to identify the correct spinal level. The dorsal surface of the sacrum is easily identified, and the lumbar spinal processes can be counted from caudal to cephalad. By sliding the transducer laterally, a longitudinal paravertebral image is obtained, and the corresponding transverse processes can be easily seen (Fig. 78.3). Once the appropriate level is identified, the transducer can be rotated transversely to obtain a short-axis view showing the facet joint space between the inferior and superior articular processes (Fig. 78.4). The target is the midpoint of the joint space. After preparation of the skin with antiseptic solution, a skin wheal of 1% mepivacaine is raised at the site of 23-gauge needle insertion. A 20-gauge needle is advanced in-plane with the US beam from lateral to medial under real-time ultrasound image aiming toward the target (Fig. 78.4). Often it is difficult to see the entire needle shaft clearly while it is advanced because the needle angle is usually between 45 and 60°. 1% mepivacaine and dexamethasone are injected (1 mL).

78.5.2 X-Ray Fluoroscopy-Guided Method

The patient is placed prone with the hips supported by pillows. C-arm is angled obliquely 25–35° from the sagittal plane and without caudal angulation. This angle allows direct visualization of the facet joint (Fig. 78.5). After preparation of the skin with antiseptic solution, a skin wheal of 1% mepivacaine is raised at the site of 23-gauge needle

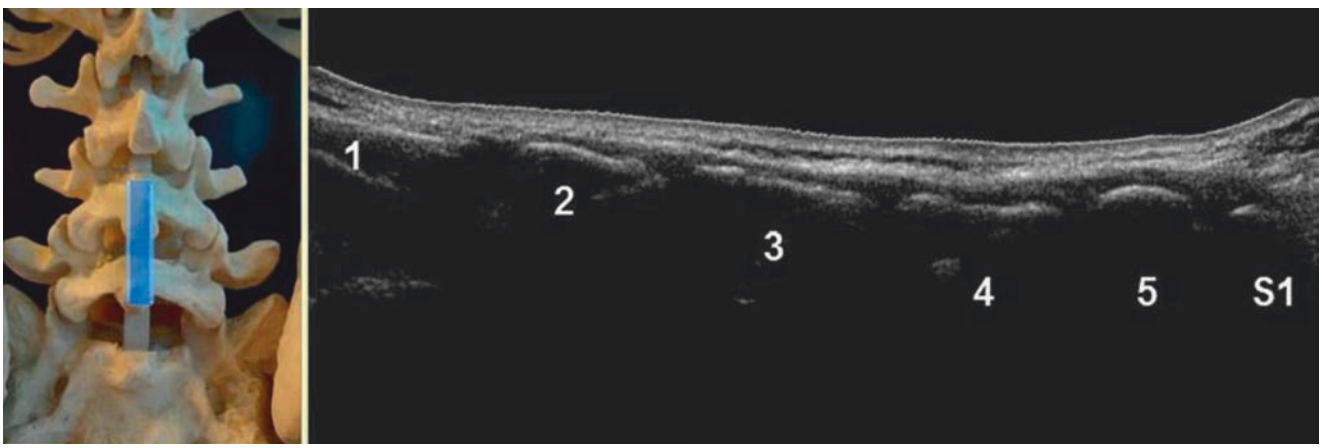

Fig. 78.3 Longitudinal midline sonogram of lumbar spinous processes

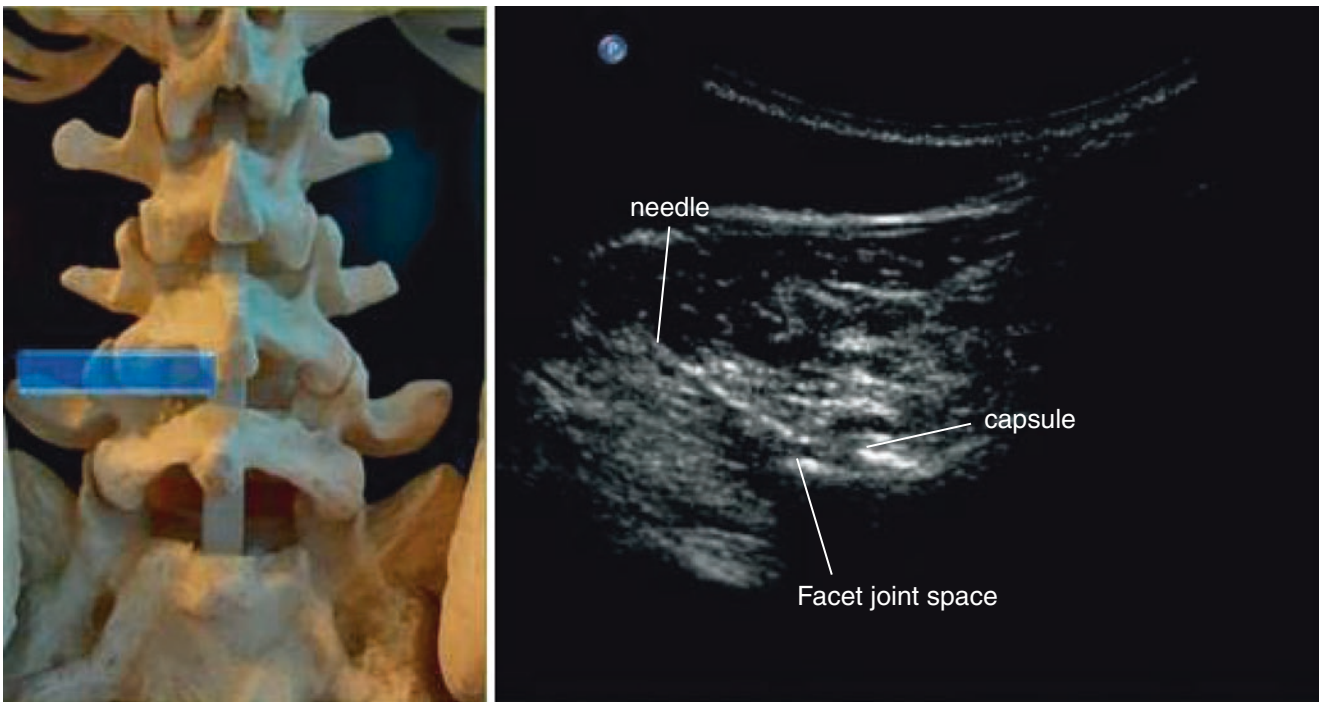

Fig. 78.4 Short-axis view of the lumbar facet joint. The sonogram shows the needle placed in the joint

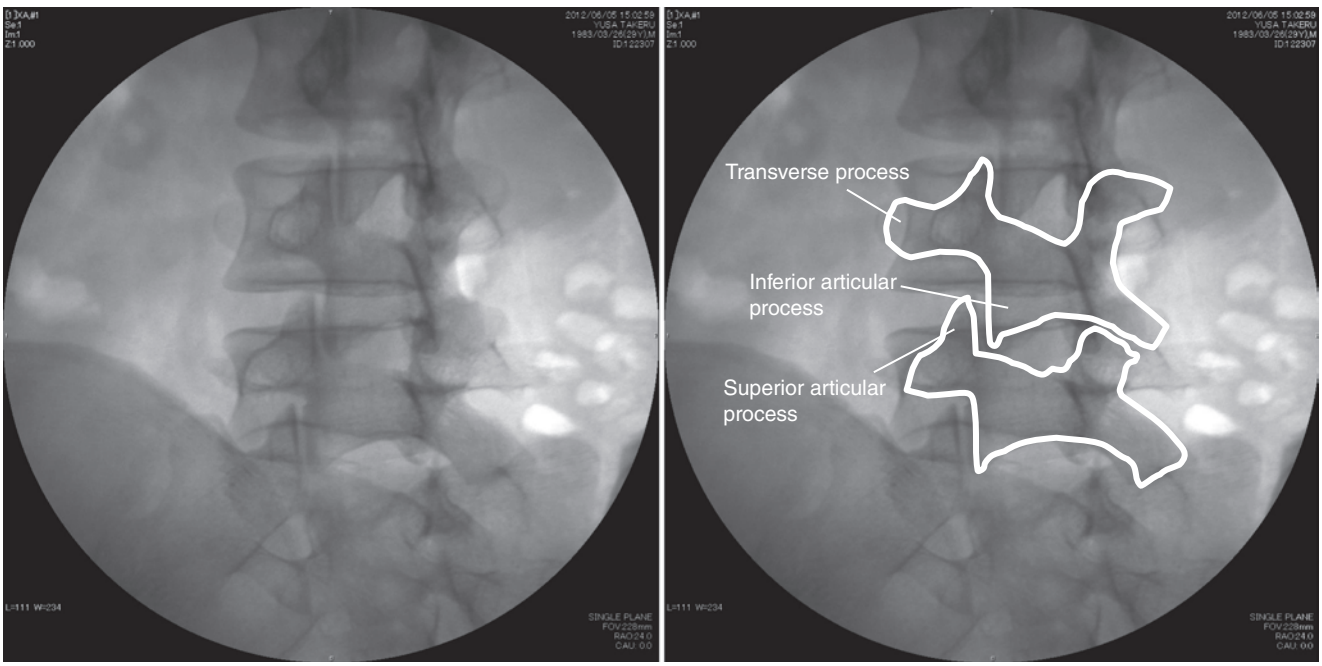

Fig. 78.5 Oblique fluoroscopic image for the lumbar spinal facet block

insertion. A 23-gauge, 6 cm needle is inserted at the insertion site to serve as an introducer. The fluoroscopy beam is aimed directly through the introducer needle, which will appear as a small point on the fluoroscopy screen. The needle is then adjusted to remain coaxial and advanced toward the joint space (Fig. 78.6). The lumbar spine facet joint itself holds only limited volume (<1.5 mL), and placing contrast in the joint limits the ability to place mepivacaine

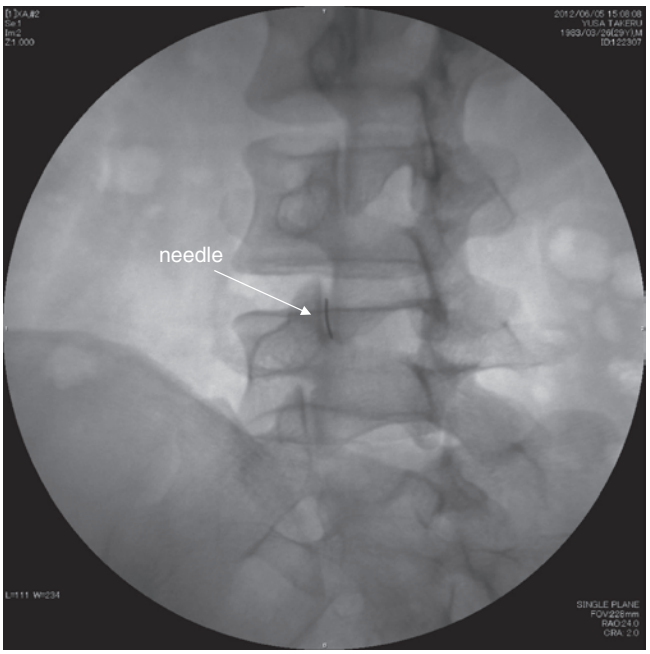

Fig. 78.6 Fluoroscopic image showing the needle inserted for the facet block

and dexamethasone within the joint. Nonetheless, intra-articular injection of contrast medium is commonly carried out at the lumbar levels (Fig. 78.7). Once needle position has been confirmed, a solution containing 1% mepivacaine and dexamethasone is placed. To block the lumbosacral facet joint, it may be necessary to move the needle insertion point slightly more inferior and lateral to avoid the posterior superior iliac crest.

78.6 Complications

Complications associated with lumbar spine facet block are uncommon. The most likely complication is exacerbation of pain. The joint space is narrow and advancing the needle within the joint can abrade the articular surface, causing increased pain.

Infection can also occur, leading to abscess within the paraspinous musculature, but the incidence is extremely low.

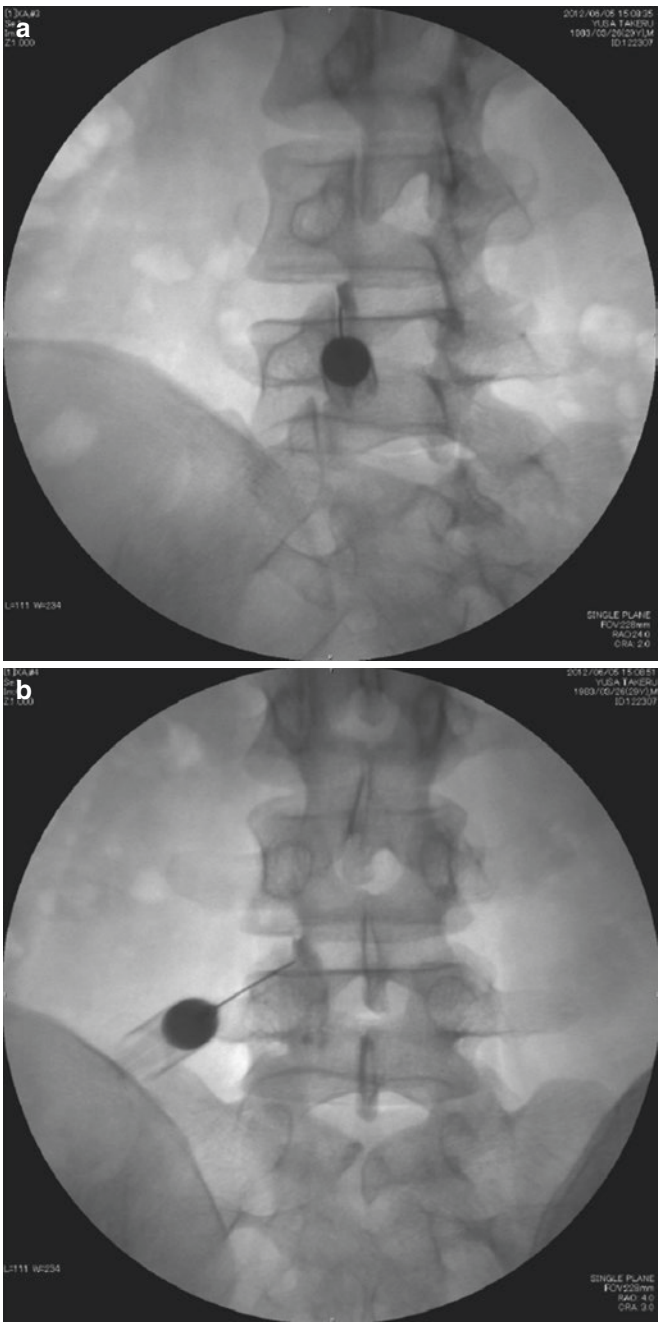

Fig. 78.7 Radiograph after injection of radiographic contrast medium into the facet joint. (**a**) Oblique view. (**b**) Anteroposterior view

References

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