35

Open Far Lateral Disk Herniation

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Description
A technique to access the nerve root and disk pathology lateral to the foramen for removal of a far lateral disk herniation.

Key Principles
Midline or paramedian incision and an approach without entering the spinal canal to maintain the integrity of the facet joint and expose the nerve root (**Fig. 35.1** and **35.2**).

Expectations
A hemilaminectomy and facetectomy may lead to poor long-term results for far lateral disk herniation surgery. Adapting a method to avoid issues of mechanical instability by approaching the impinged nerve root and disk lesion from lateral to the pars/facet joint will improve outcomes.

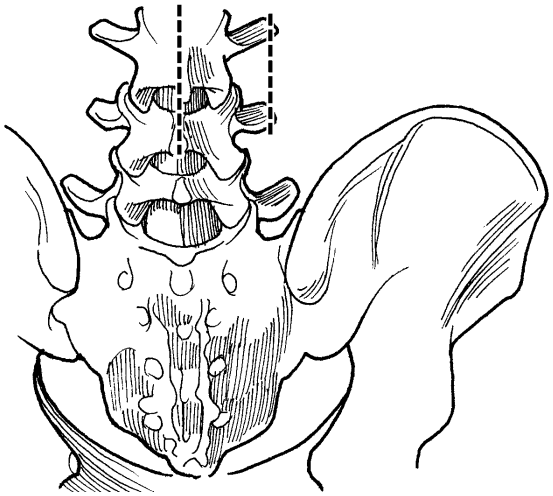
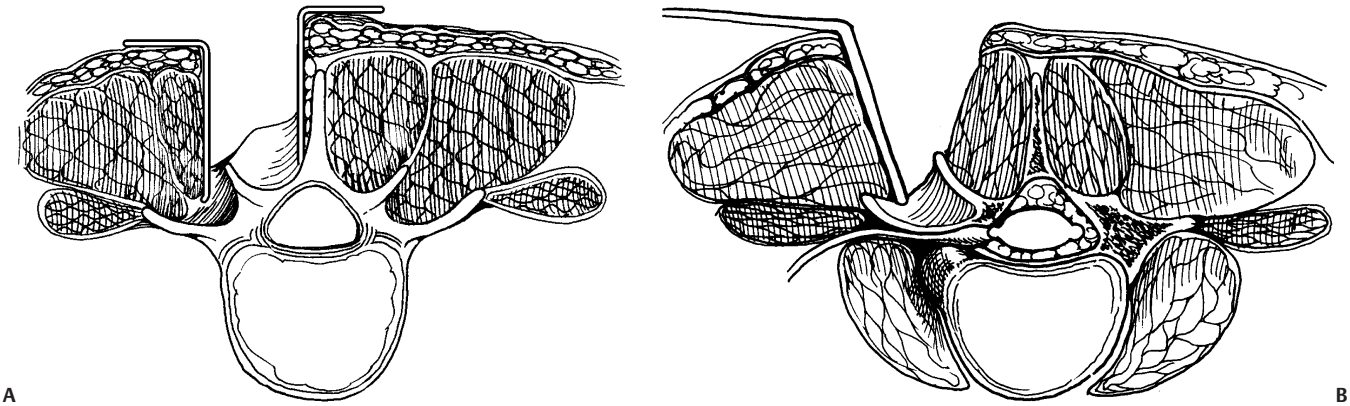


Fig. 35.1 *Incision options include midline or paramedian. A midline approach requires a longer incision to expose far lateral to the TP and pars; however, it will be more "familiar" anatomy. A paramedian incision will be a shorter, muscle-splitting approach.*



A **B**

Fig. 35.2 ***(A,B)*** *A midline incision results in a more painful muscle dissection and retraction combination. The paramedian incision is a more direct route to the pathology; however, it is an unfamiliar approach.*

Indications
- Single-level radiculopathy secondary to far-lateral disk herniation
- Sensorimotor deficit or radicular pain—failure to improve with conservative care.

Contraindications
- Pathology within the spinal canal
- L5-S1 far lateral disk lesion is difficult to approach from a lateral incision due to iliac crest; check with preoperative imaging first.
- Spondylolisthesis that requires fusion

Special Considerations
If a far lateral disk herniation is suspected on computed tomography (CT), it can be confirmed with magnetic resonance imaging (MRI), including parasagittal views.

Special Instructions, Position, and Anesthesia
Position the patient prone on a Wilson frame, Jackson spine table, or a 90/90 Andrews frame. Use x-ray or fluoroscopy to mark out the limits of the exposure *prior* to skin incision, and then reconfirm when landmarks are exposed. Illumination and magnification are paramount; use either a microscope or loupe/headlight combination. Endoscopy may be an option with tubular retraction devices.

Tips, Pearls, and Lessons Learned
- The parasagittal T1 MRI reveals the extent of the foraminal pathology.
- If using a paramedian incision, find the plane between the multifidus and longissimus with finger dissection, and palpate the facet joints prior to retractor placement. The distance from the midline can be measured on the preoperative imaging.
- It is easy to "get lost" due to unfamiliarity with this exposure. Define bone landmarks in detail: transverse process (TP), pars, and facet joint.
- Elevate the intertransverse membrane from the inferior edge of the TP as it meets with the pars and then mobilize laterally and inferiorly.
- Always have a spine model in the operating room to orient yourself, as the anatomy can become confusing if you rarely perform a lateral exposure.

Difficulties Encountered
- Bleeding down a deep hole: maintain strict hemostasis during initial exposure
- A consistent radicular vessel will be found lateral to the facet joint/pars: use bipolar cautery.
- The impinged nerve root may be effaced against the intertransverse membrane: care should be taken when elevating.
- If a large hypertrophied facet joint is overlying the nerve, be prepared to remove some lateral and superior joint for exposure.

Key Procedural Steps
- Obtain x-ray *prior* to skin incision to define level.
- During muscle and bone dissection, preserve facet capsule.
- Key bone landmarks must be seen (**Fig. 35.3**): TP, pars, and facet joint. Reconfirm levels with x-ray when anatomic landmarks are exposed.

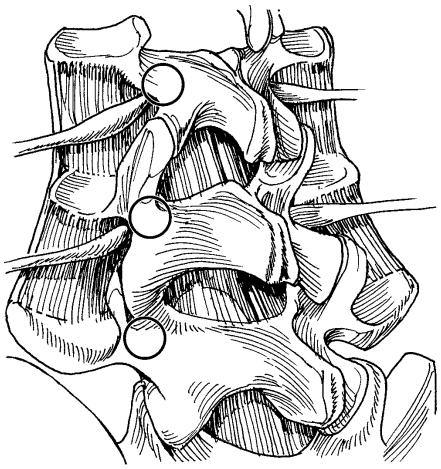


Fig. 35.3 *After the initial exposure, the following landmarks must be seen before proceeding with nerve exploration. In this case, for a L3-L4 far lateral disk resulting in L3 nerve root impingement, the transverse process (TP) and pars of L3 must be clearly visualized. In addition, the L3-L4 facet joint and L4 TP should be seen to delineate the intertransverse membrane prior to incising this structure.*

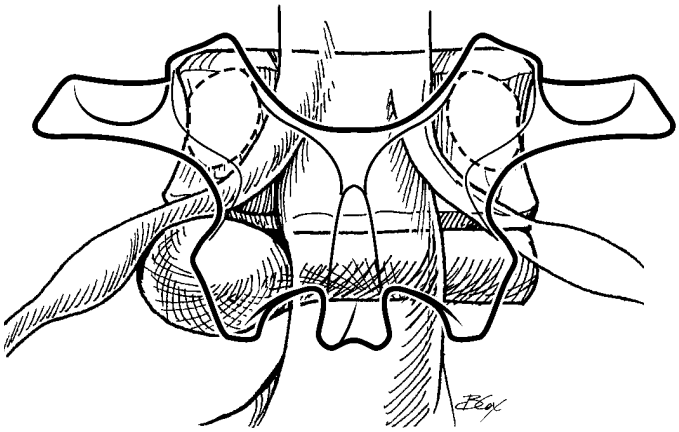


Fig. 35.4 *Note the course of the L3 nerve root. Most far lateral disk herniations will push the nerve root superiorly against the L3 pedicle. Depending on the patients' individual anatomy, some bone from the pars and facet joint may require removal to clearly visualize the course of the L3 nerve root prior to disk removal.*

PITFALLS
- Bleeding that is difficult to control: pressure, Gelfoam, and bipolar cautery
- Difficultly finding the nerve root: refer to T1-weighted MRI and recheck level with fluoroscopy

- Elevate the intertransverse membrane from the inferior aspect of the superior TP.
- Nerve location may be unpredictable and time consuming to dissect out (**Fig. 35.4**).
- Mobilize nerve superiorly to access disk herniation.

Bailout, Rescue, Salvage Procedures

If the anatomy is confusing, extend the incision to identify more normal anatomy especially medially, where you can work on either side of the pars and identify the root in a more familiar setting.