Dissection – Laminectomy and Exposure of the Vertebral Canal

Dissection Instructions

1. Wear eye protection for all steps that require the use of a chisel, bone saw, or bone forceps.
2. Use a scalpel to remove the erector spinae muscles bilaterally from vertebral levels C4 to S3. The laminae must be clearly exposed. Use scraping motions with a chisel to clean the laminae after the muscles have been removed.
3. Use a chisel or power saw to cut the laminae of vertebrae T6 to T12 on both sides of the spinous processes (Fig. 1.14). Make this cut at the lateral end of the laminae to gain wide exposure to the vertebral canal. The cutting instrument should be angled at 45 degrees to the vertical.
4. Use a scalpel to cut the interspinous ligaments between vertebrae T5 and T6 and between vertebrae T12 and L1. Leave the remaining interspinous ligaments undisturbed to maintain the laminectomy specimen intact.
5. Use a chisel to pry the six spinous processes and their laminae out as a unit. The dura mater will be undamaged.
6. Observe the ligamenta flava on the deep surface of the laminectomy specimen. The ligamenta flava connect the laminae of adjacent vertebrae.
7. Continue the laminectomy procedure superiorly and inferiorly from the opening in the vertebral canal. Exercise caution in lower lumbar and sacral regions, because the vertebral canal curves sharply posteriorly (Fig. 1.15A). Do not drive the chisel or push the saw through the sacrum into the rectum.
8. When finished with the laminectomy, you should see the posterior surface of the dura mater from vertebral levels C4 to S2.

SPINAL MENINGES

1. Observe the epidural (extradural) space. Use blunt dissection to remove the epidural fat and the posterior internal vertebral venous plexus from the epidural space. [N 163]
Laminectomy and Exposure of Spinal Cord
Vertebral Column

Anterior view
- Atlas (C1)
- Axis (C2)
- C7
- T1
- T12
- L1
- L5
- Sacrum (S1–5)
- Coccyx

Left lateral view
- Atlas (C1)
- Axis (C2)
- C7
- T1
- T12
- L1
- L5
- Sacrum (S1–5)
- Coccyx

Posterior view
- Atlas (C1)
- Axis (C2)
- C7
- T1
- T12
- L1
- L5
- Sacrum (S1–5)
- Coccyx

Cervical vertebrae
Thoracic vertebrae
Lumbar vertebrae
Sacrum (S1–5)
Vertebral Column - Thorax

6th thoracic vertebra: superior view

6th thoracic vertebra: lateral view

7th, 8th and 9th thoracic vertebrae: posterior view

12th thoracic vertebra: lateral view
Ligaments of the Vertebral Column – Saggital View

Left lateral view (partially sectioned)

- Interior articular process
- Capsule of zygapophyseal joint (partially opened)
- Superior articular process
- Transverse process
- Spinous process
- Ligamentum flavum
- Interspinous ligament
- Supraspinous ligament
- Intervertebral foramen

- Lumbar vertebral body
- Intervertebral disc
- Anterior longitudinal ligament
- Posterior longitudinal ligament
Ligaments of the Vertebral Column – Anterior Vertebral Canal

Anterior vertebral segments: posterior view (pedicles sectioned)

- Pedicle (cut surface)
- Posterior surface of vertebral bodies
- Posterior longitudinal ligament
- Intervertebral disc
Figure 1.13. The spinal cord within the vertebral canal.
Inferior Spinal Cord, Dural Sac, and Filum Terminale

**Figure 1.15.** Lower portion of the vertebral canal and spinal cord. A. Lateral view. B. Posterior view.
Spinal Cord Enlargements, Disc Herniation, and Nerve Compression

- Cervical nerves
- Thoracic nerves
- Lumbar nerves
- Sacral and coccygeal nerves

1st cervical nerve (C1) exits above C1 vertebra
8th cervical nerve exits below C7 vertebra (there are 8 cervical nerves but only 7 cervical vertebrae)

Lumbar disc protrusion does not usually affect nerve exiting above disc. Lateral protrusion at disc level L4–5 affects 5th lumbar nerve, not 4th lumbar nerve. Protrusion at disc level L5–S1 affects 1st sacral nerve, not 5th lumbar nerve

Medial protrusion at disc level L4–5 rarely affects 4th lumbar nerve but may affect 5th lumbar nerve and sometimes 1st–4th sacral nerves
Arteries of the Spinal Cord

Anterior view

Posterior cerebral artery
Superior cerebellar artery
Basilar artery
Anterior inferior cerebellar artery
Posterior inferior cerebellar artery
Anterior spinal artery
Vertebral artery
Anterior radicular arteries
Ascending cervical artery
Deep cervical artery
Subclavian artery
Anterior radicular artery
Posterior intercostal artery
Pial plexus
Artery of Adamkiewicz (major anterior radicular artery)
Posterior intercostal artery
Anterior radicular artery
Lumbar artery
Anastomotic loops to posterior spinal arteries
Cauda equina arteries
Lateral (or middle) sacral artery
Thoracic vertebrae
Cervical vertebrae

Posterior view

Posterior inferior cerebellar art
Posterior spinal arteries
Vertebral artery
Posterior radicular arteries
Deep cervical artery
Ascending cervical artery
Subclavian artery
Posterior radicular arteries
Posterior intercostal arteries
Posterior radicular arteries
Lumbar arteries
Anastomotic loops to anterior spinal artery
Lateral (or middle) sacral artery
Sacrum
Meninges of the Spinal Cord

Figure 1.16. Relationships of the meninges to the spinal cord and nerve roots. 
A. Transverse section. B. Posterior view.
Drawing - Suboccipital Triangle
Figure 1.17. Lumbar puncture for removal of cerebrospinal fluid.