

Anterior lumbar vertebrectomy via direct anterior approach: technical note

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Clinical vignette

The authors report the case of a 67-year-old female who presented with progressive worsening of low back pain for a period of 3 to 4 weeks, with acute severe deterioration over one week associated with left quadriceps weakness and absence of knee reflex. Imaging reveals a lytic lesion on the L4 vertebral body, with a pathological fracture. Positron emission tomography (PET) revealed significant uptake in the L4 vertebral body and minimal uptake in the lungs. Surgical removal of the lesion was recommended as the choice of treatment. An anterior approach for a complete vertebrectomy and a conventional minimally invasive posterior approach for lumbar interbody fusion 3 days post-anterior vertebrectomy was planned. The anterior approach for complete L4 vertebrectomy was documented in the presented video.

Technical note (Figure 1)

The patient was placed in a supine position and a midline incision from the symphysis to the umbilicus was performed. Retroperitoneal dissection with blunt dissection was performed via a left sided approach, with fixed-bed-based round retractor and multiple retraction blades to reveal the retroperitoneum. Mobilization of the aorta and inferior vena cava was performed with ligation of segmental vessels. A key point here is ligation of the iliolumbar vein, which allows safe mobilization and retraction of the left common iliac vein and the inferior vena cava, which was performed using ligaclip and suture tie. These steps allow exposure of the appropriate surgical anatomy (Figure 2).

The L4 vertebrae, L3/4 and L4/5 intervertebral



Figure 1 Surgical workflow technique (1).

Available online: <http://www.asvide.com/articles/1574>

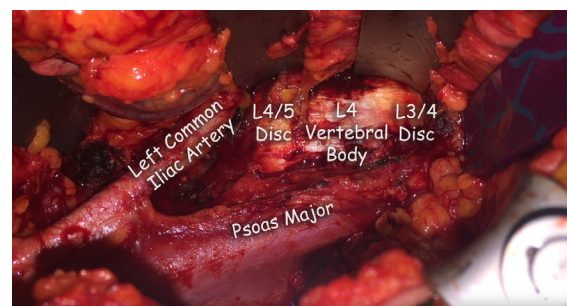


Figure 2 Exposure of the L3/L4 and L4/L5 vertebral discs and their surrounding muscular and vascular structures following direct anterior approach.

discs were then removed. Complete vertebrectomy was performed using piecemeal technique using drill and bone nibblers of the L4 vertebral body along with the tumour.

Throughout these steps, hemostasis was maintained with bone wax to control bone bleeding. Part of the resected tumour was sent for histopathology. A microscope was used for complete removal of the tumour and decompression of the L4 nerve root. An expandable cage implant was then placed in the vertebral body cavity under the microscope, after which the device was expanded to achieve firm fixation onto the adjacent endplates. Throughout the procedure, the retractors were regularly released to allow blood flow. Additional bone graft was added to facilitate bone growth and fusion over the implanted cage followed by standard wound closure.

Percutaneous posterior pedicle screws were inserted 3 days later via a posterior approach to stabilise the vertebral column. The patient made a rapid recovery and regained lower limb function and mobility.

Conclusions

This procedure was carried out by a team of neurosurgeons and vascular surgeon to ensure the safety and efficiency of the patient and procedure (2). Adequate mobilization of the vessels to allow a direct visualisation and approach is a crucial process in this procedure (3). It is also important for regular relaxation of the retractors to ensure adequate blood flow to the lower limb. Although there is evidence that vascular approach surgeons may not offer additional benefit over well trained spine surgeons with approach training and skill set (4), for total vertebrectomy via a direct anterior approach, we recommend a vascular team (5) to be involved due to the additional mobilisation of the aorta, and IVC, required for this technique. Currently there are limited literature regarding anterior approach for complete vertebrectomy. However, with proper exposure, this technique is safe, direct

and quick with complete visual control (6).

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None.

Footnote

Conflicts of Interest: The authors have no conflicts of interest to declare.

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