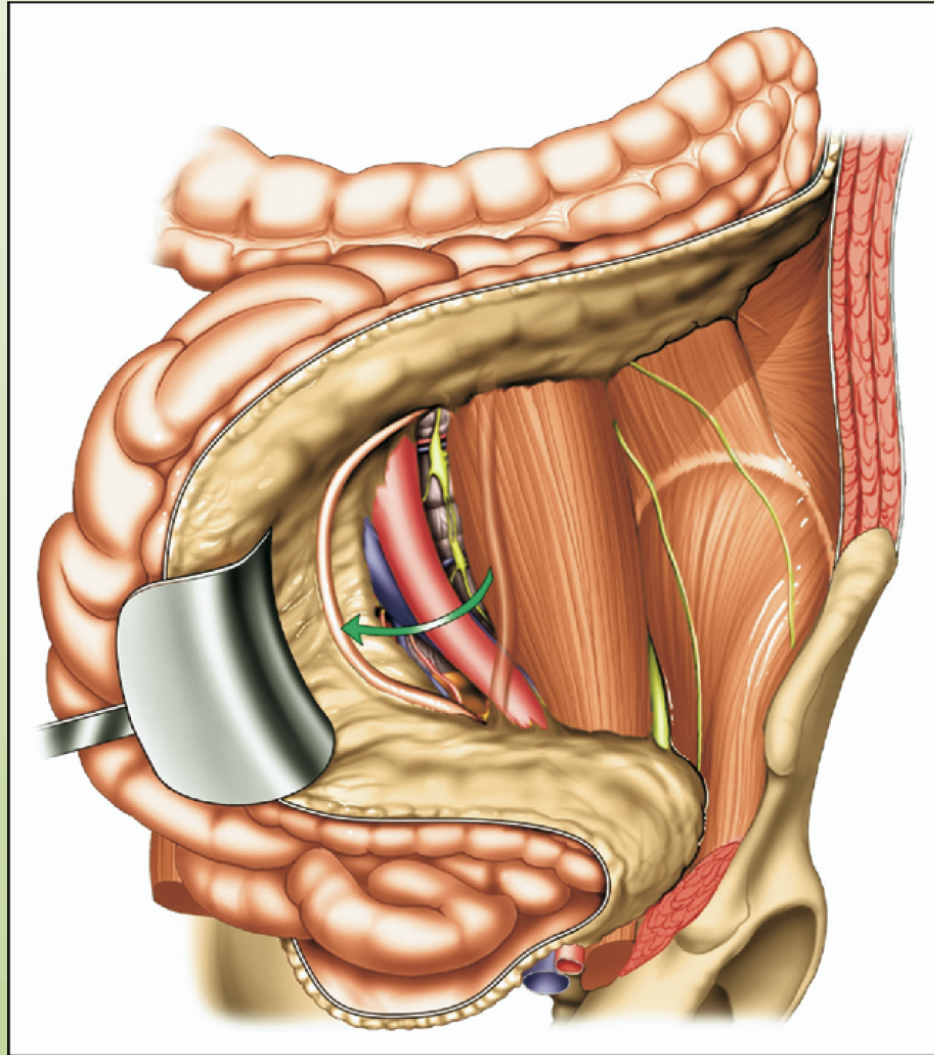


Anterior Exposure for Spinal Surgery.



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New Treatments

The development of new technologies has increased the range and efficacy of treatments for your chronic back pain. Your spine surgeon will have discussed these with you in-depth.

These advanced procedures utilise an approach to the vertebral column from the front rather than the back. To facilitate this, a team approach is required, with a surgeon very familiar with these approaches exposing the vertebral column prior to the spinal procedure. As a vascular surgeon I am familiar with this approach and the vital structures encountered. One of the significant potential complications from the surgery is bleeding from these vessels, which I am trained to manage and repair.

Investigations

Your spine surgeon will organise many of your investigations. Some investigations to examine the position and state of the vessels may be required which I shall arrange. Usually this is an ultrasound scan but occasionally a CT scan is required.

The Procedure

Incision

The incision used depends on the vertebral level/s exposed, any previous surgery you have had and the presence of any disease or abnormality in the pelvic vessels.

The incision is usually either an 'up-and-down' incision in the middle of the lower abdomen or a 'side-to-side' incision on the right (or occasionally left). The exact incision will be discussed with you. The incision is approximately 10-15cm long and will be as small as is safe.

Procedure

The incision is gently deepened through the fat down to the muscle and fibrous tissue which make up the abdominal wall. The muscle is usually **not cut**, though its surrounding envelope is opened and repaired at the end.

Deep to the muscle there is the sac that contains the intestine. This peritoneal sac containing the bowel is retracted towards the middle. This is done with padded retractors. During this process, the tube between the kidney and the bladder called the **ureter** is identified and protected. The muscle of the posterior abdominal wall is exposed, and upon them are the pelvic vessels – the iliac artery and vein. (See Figure 1)

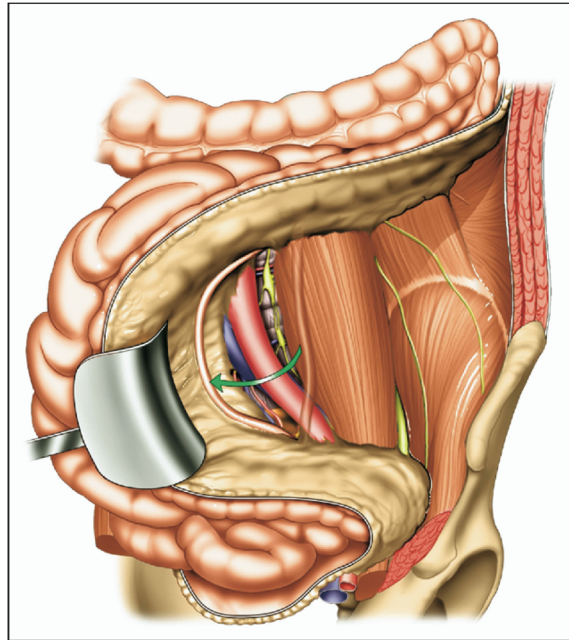


Figure 1. Exposure of the posterior abdominal wall and the vessels in front of the vertebral column. The green arrow indicates the ureter.

For the **L4/5 exposure**, the artery is carefully exposed, sweeping the nerves upon it to the midline. Small arterial branches are carefully tied and then divided to allow the artery to be mobilized toward the middle. Attention is then turned to the vein. There are often large branches from the vein that need to be carefully dissected, tied and divided to allow the iliac vein to be mobilized toward the midline. (See Figures 2 and 3). The nerves, artery and vein are then gently retracted to the right exposing the midline of the vertebral column to allow the spinal procedure.

For **L5/S1 exposure**, the approach is between the iliac vessels that are then retracted up and apart to expose the disc level. (See Figure 4)

During the procedure, a **cell-saver machine** is used to return to you much of the blood you have lost during the procedure. If the retractors impair the blood supply to the legs, a blood-thinning drug (heparin) may be administered.



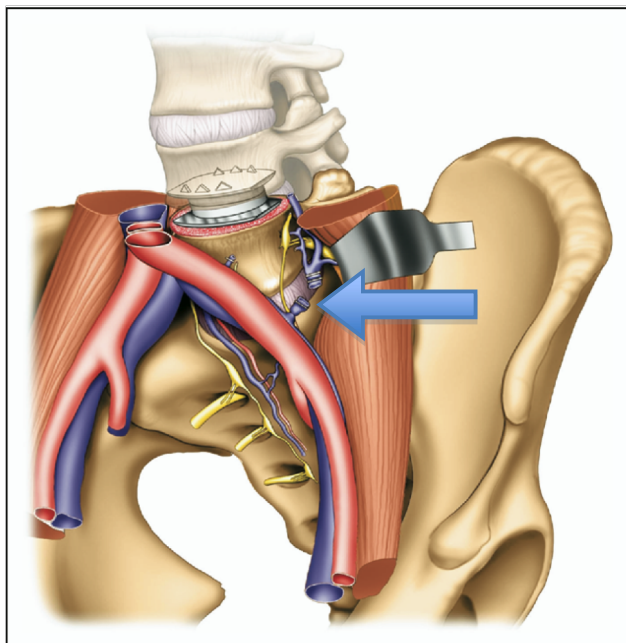


Figure 2. Shows proposed level of insertion of artificial disc and the division of the large branch of the iliac vein (blue arrow) to allow safe retraction.

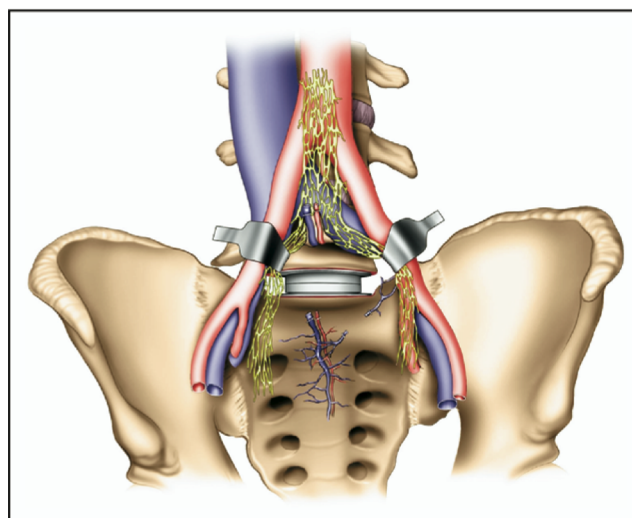


Figure 4. Exposure and retraction for **L5/S1 level procedures**.

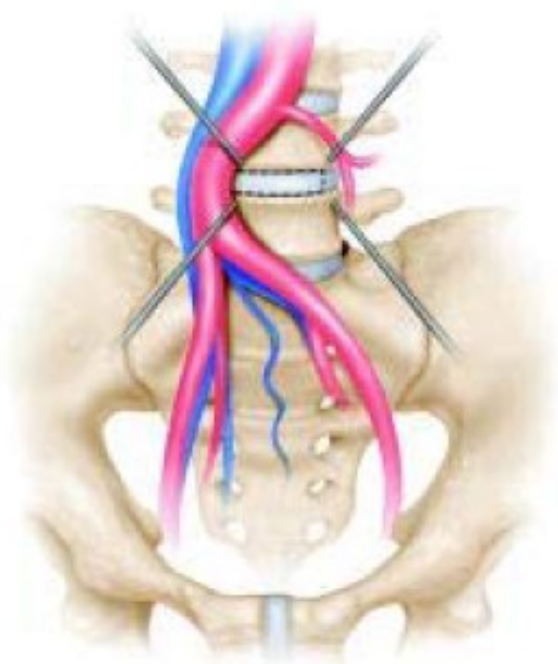


Figure 3. Retraction of the iliac vessels to expose the **L4/5 disc space**. Various retraction methods available.

Side effects and Complications

There are possible complications from the exposure despite all possible care and diligence. Some complications can be life-threatening. Your spine surgeon will discuss the complications from the spinal procedure. The complications include:-

General risks:-

- **Death.**
- **Heart Attack.**
- **Stroke.**
- **Allergic reactions** to medications and antibiotics.

Specific risks include:-

- **Bleeding** which is occasionally life-threatening. It may necessitate a **blood transfusion** or an urgent **return to theatre**. It may also cause the procedure to be abandoned for safety (2%¹).
- **Emboli (clots)** to the legs requiring urgent further surgery to restore circulation. Rarely this can result in limb loss.
- **Bowel Injury** from retractors or dissection. If this were to occur then the injury would require repair and the vertebral procedure abandoned.
- **Blockage of the vessels supplying the intestine or kidney**. This is very rare. It could result in bowel or kidney loss.
- **Ileus** – a temporary slowing of the intestinal function which can cause discomfort and bloating.



- **Sexual Dysfunction** (In males) with either **infertility** or **impotence**. This occurs at a rate of approximately 3-5%¹ and may be temporary or permanent. Our incidence of this complication is < 1%.
- **Arterial Occlusion**. The circulation to the legs is usually monitored throughout the procedure and checked at the end. If an occlusion were detected, then immediate procedures may be required to correct this.
- **Ureter injury**.
- **Sympathetic Nerve damage**. This may cause one limb to be flushed in comparison to the other, with possible sweating or swelling. It can be temporary or permanent.
- **Lymphocele**. A collection of clear fluid in the posterior abdomen. It often requires percutaneous drainage under local anaesthetic by radiology. It rarely requires surgery.
- **Deep Venous Thrombosis** – a clot in the deep veins of the leg (2.5%)¹.
- **Pulmonary Embolus** – a clot traveling to the lung, which can occasionally be life-threatening.
- **Incisional Hernia Formation** (0.5%)¹.
- **Superficial Wound Infection**.
- **Abandonment**. If conditions are encountered rendering the procedure too dangerous to continue I will be unable to complete the exposure.

References

1. Garg et al Vascular complications of exposure for anterior lumbar Interbody fusion. JVS 2010 51 946-50.

2. Gumbs et al Open anterior approaches for lumbar spine procedures. The American Journal of Surgery 194(2007) 98-102.

