Anterior Spinal Surgery

For most people about to undertake spinal surgery the expectation is that the operation would take place through the skin on the back of the spine. This is true in most cases, but in some patients an approach to the front or side of the spine is needed and to achieve this, an anterior approach is often needed. Spinal surgeons describe ‘going through the front’ but in reality many of the approaches to the front of the spine involve an incision though the side.

In the neck, most operations are done through an anterior approach (see neck surgery sheet) to the front of the spine, but in the thoracic and lumbar spine most approaches are posterior. Sometimes, anterior surgery is mandatory, but often a posterior approach or an anterior approach can achieve the same goal and the decision depends on the surgeon.

Anterior approaches in the thoracic spine are performed for:

1. Anterior release in scoliosis/kyphosis surgery
2. Tumour excision
3. Fracture stabilisation
4. Drainage of infection

In the lumbar spine, anterior approaches are performed for:

1. Anterior release in scoliosis/kyphosis surgery
2. Tumour excision
3. Fracture stabilisation
4. Drainage of infection
5. Anterior discectomy and fusion
6. Total disc replacement

Occasionally, anterior approaches are used in isolation with anterior instrumentation, but more commonly there is a secondary or primary posterior approach to stabilise the spine – especially in the case of tumours, infections or fractures.

Essentially, there are 5 approaches to the anterior thoracolumbar spine:

1. Thoracotomy (down to T12)
2. Thoraco-abdominal approach (T12 – L2)
3. Retroperitoneal approach (L1-S1)
4. Transperitoneal approach (L1-S1)
5. Direct lateral T8-L4

Thoracotomy

Commonly from the left unless deformity to right. Option to take or leave a portion of rib – which often regenerates if taken. The lung is retracted to provide excellent exposure to the spine. Following the surgery a chest drain is left in situ for 48 -72 hours.

Thoracoabdominal approach

This is an extensile approach opening the thoracic and abdominal cavities by taking down the diaphragm which needs to be repaired at the end of the procedure. It sometimes needs to be used for fractures around the thoracolumbar junction to provide safe access, but is mainly used in scoliosis surgery. A chest drain is also used following closure unless the extrapleural approach is used which is occasionally possible.

Retroperitoneal approach

Various different incisions can be used to approach the lower lumbar spine anteriorly depending on the level to be approached. In the case of a single level approach to L4/5 or L5/S1 a small bikini line incision can be used which is cosmetically appealing. The advantage of this approach is that muscles are not cut, simply divided and so recovery is quick and the surgery is less 'invasive' than posterior surgery. The reason it is not used more often is a lack of familiarity among surgeons, but post-operative recovery is often a lot quiver than posterior surgery and it therefore provides an attractive option for low lumbar fusion or disc arthroplasty.

Transperitoneal approach

This is a more direct approach to the spine and involves entering the peritoneal cavity where one finds the bowels which need to be retracted. The main disadvantage of this approach is that bowel adhesions may develop post-operatively and the risk of post-operative ileus (intestines not working) is increased.

Direct Lateral

Often use with monitoring to prevent damage to nerves in muscle and can be very effective in certain indications. The lower levels have increased risk of damaging nerves however and so better to avoid if possible.

Complications

The general risks of surgery exist as in all operations e.g. bleeding, infection, nerve damage, medical problems, ileus but there are specific problems relating to anterior surgery.

The specific complications that relate to these approaches relate to the adjacent structures retracted to obtain access. In thoracotomy, patients may have scar pain or neuralgia from the adjacent intercostal nerve. Damage to lung or large vascular structures is very rare but possible and bleeding can occur from segmental vessels that supply the spine. The thoracic duct (carrying lymphatic fluid from below) traverses the thoracic cavity adjacent to the spine and damage to this is often not seen during surgery but presents a few days postoperatively with lymphatic fluid leaking into the chest cavity which requires drainage. A further hazard is the sympathetic nerves which provide a nerve supply to the blood vessels in the limbs. These are often not seen and damaged during surgery. There are no long term troublesome sequelae from this but the patient may complain of a dry warm lower limb on the affected side for a short period of time. Rarely the effect is prolonged.

The above problems also apply to the thoracoabdominal and lower lumbar approaches, but a further problem is post-operative herniae which can occur through the diaphragm or abdominal wall. With this approach and the lower lumbar approaches the viscera (bowel, bladder, ureter) could be theoretically damaged although this is extremely rare.

In the lower lumbar approaches to L4/5 and L5/1 a particular concern are the large blood vessels crossing the operative field. Normally these can be safely retracted, but occasionally there is an anatomical variant and a vessel needs to be tied to obtain safe access. In males, a particular concern is damage to the nerves in front of L5/S1 that affect sexual function. A known complication of this surgery in males is retrograde ejaculation and patients need to be counselled appropriately pre-operatively regarding this.

© ianjharding.com 2018