

Cases Of Sudden Death Following Lumbar Spinal Surgery In The Elderly

Spinal canal decompression operations are performed frequently for the relief of symptoms arising in patients with spinal canal stenosis. The majority of those who require surgery for this condition are elderly. Providing certain precautions are taken to avoid complications in the course of these procedures by both the anaesthetist and the surgeon, they are currently held to be safe and effective. Death on the table or immediately post operation should be extremely rare.

Anaesthesia

In patients with associated medical conditions such as diabetes mellitus, hypertension, impaired renal function and peripheral vascular disease, the use of central venous or arterial lines may be indicated for monitoring during surgery, in addition to the routine of an intravenous line.

Positioning the patient

The surgeon in concert with the anaesthetist should supervise the positioning of the patient on the operating table. The patient's eyes should be carefully padded to avoid ocular compression and below-knee elastic stockings applied to the legs. Elderly patients must be turned slowly to lie face downwards on to an excavated support, which leaves the abdomen uncompressed. The cranial end of the table should be elevated to prevent suffusion of the head, which may cause mental confusion after operation. Intermittent calf stimulators should be fitted after the patient has been turned on the operating table.

The table should then be adjusted so that the hips and knees are slightly flexed. Positioning elderly patients prone, with legs in the kneeling position, should be avoided.

1. Decompression laminectomy involves excision of spinous processes and removal of the lamina or laminae at the level of spinal stenosis.

The exposure

The spinal muscles on each side are separated from their bony attachments and held apart with self-retaining retractors to expose the stenotic segment or segments of the vertebral column. In large patients, blood loss during this phase may be considerable unless care is taken dissecting the muscle mass, first on one side of the spinous process, using cutting diathermy at the tip of the spinous process, followed by separation of the muscle from the outer surface of the lamina to the level of the facet joint capsule, and prompt insertion of packing gauze between the roof of the spinal canal and the separated muscle mass. The procedure is repeated on the other side of the spinous process and lamina, again with the insertion of gauze packing. Using this technique, blood loss at this stage of surgery should be minimal. The packs are then removed rapidly and self-retaining retractors inserted to expose the roof of the spinal canal.

The laminectomy

The interspinous ligaments are excised and the spinous process or processes are then removed with rongeurs to their bases on the centre of their respective laminae. In osteoporotic patients, blood loss from the cut surfaces of the bone can be brisk. Bone wax should be applied promptly to control this source of bleeding.

The interlaminar space at one level should be cleared of soft tissue remnants to expose the ligamentum flavum, using pituitary rongeurs. The inferior edge of the rostral lamina should then be trimmed laterally to the inner margins of the facet joint capsules, thereby exposing the ligamentum flavum near its upper attachment at the under surface of the lamina. The distal

attachment of the ligamentum flavum to the rostral edge of the caudal lamina should be curetted from the bone and retracted to expose the epidural space. The ligamentum flavum in patients with long-standing spinal stenosis is grossly thickened with patchy calcification. It may be adherent to the dural sac in which case tears in the dural membrane may occur unless the dissection is performed with great care.

Following removal of the ligamentum flavum, the laminae are then removed with angled rongeurs, preserving the pars interarticularis on both sides at each spinal segment. The medial and apical margins of the facet joints are then rimmed to complete decompression of the nerve root canals and intervertebral foramina bilaterally. During this phase of the operation, venous haemorrhage may occur. It can be controlled using strips of gelfoam placed on the bleeding site, held in place with cottonoid patties which are manipulated into place on the end of a sucker. This method of controlling venous haemorrhage is effective in most cases, so that bipolar electrocoagulation is rarely required.

Closure of the wound

A drain tube is placed along the length of the decompressed spinal canal, lying along one side of the exposed dural sac. The paraspinal muscles are brought side by side with sutures inserted only in the lumbar dorsal aponeurosis, the drain tube emerging lateral to the midline. Skin closure is effected and dressing applied. The drain tube is connected to a sealed bottle, but is only activated once the patient is lying on his/her back, when the body weight pressure will prevent the suction of large amounts of blood.

Removing the patient from the operating table

The table is straightened and the turning team instructed to roll the patient slowly on to his/her back into the arms of two attendants, while the anaesthetist holds the head and the patient is gently lowered on to a trolley. The anaesthetist removes the endo-tracheal tube and the suction drainage system is activated. If the patient coughs violently during extubation, a large volume of venous blood may drain suddenly in to the suction bottle. Should this occur, the drain tube suction should be closed immediately.

Summary

Potential hazards:

- (i) Positioning the patient on the operating table
 - (ii) Arterial bleeding during the preliminary exposure of the laminae over the length of the spinal stenosis
 - (iii) Excessive blood loss from cut ends of bones
 - (iv) Excessive venous haemorrhage from epidural veins
 - (v) Sudden loss of blood at the conclusion of surgery when the patient is turned on to a trolley and the suction drain is activated.
 - (vi) Cardiac arrest following failure to control sudden blood loss into the suction drainage bottle.
2. Bilateral foraminal and nerve root canal decompression, with perseveration of the midline boney structures of the spinal canal.

This operation has evolved as the preferred method of decompression of the spinal canal in cases of spinal stenosis. While the hazards outlined in the text dealing with decompression laminectomy remain the same for the second method, it carries two major benefits for patient welfare. The first is a reduced risk from blood loss immediately following surgery and in the early post-operative period. The second is a more rapid return of paraspinal muscle function after the surgery.

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