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Microscopic bilateral decompression by unilateral approach in spinal stenosis

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Learning objectives

To understand different techniques for bilateral lumbar decompression through a unilateral approach.

Introduction

Spinal stenosis can cause back and leg pain known as spinal claudication. In severe cases it can also lead to neurological symptoms. In these cases or after failed conservative treatment operative decompression can be an option to decrease the symptoms. Many different techniques for decompression have been described. A bilateral decompression by unilateral approach is effective and sufficient even in multilevel spinal stenosis [1]. The film demonstrates two similar but slightly different techniques for a case of a two level spinal stenosis.

Case description

The 76-year old female patient suffered from pain in her right ventrolateral leg, which aggravated when walking. The uncomplaining walking distance was less than 100 m. Radiological examination revealed a spinal stenosis in L3/4 and L4/5 including a stable spondylolisthesis in L4/5 (Meyerding grade 1). There was no sensomotoric deficit. Conservative treatment including physiotherapy, pain medication and epidural infiltration had not sufficiently improved the symptoms so that the indication for operation was given.

Surgical procedure

The patient is placed in prone position on an adjustable table with a pad at the height of the pelvis on the contralateral side of the approach. The pad prevents the patient slipping off the table when the table gets tilted. After the usual steps with X-ray marking of the levels, disinfection and draping, a posterior midline incision above the levels L3–5 is done. The thoracolumbar fascia is opened only on the ipsilateral side and the paravertebral muscles are pushed back. Then the ligamentum flavum and the caudal and cranial laminas are exposed. A Caspar retractor is inserted. The following steps are performed with the use of a microscope. With a high speed burr the

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inferior part of the superior lamina and a small part of the medial facet are removed. Then the table is tilted to the other side to allow a better view to the contralateral side of the spinal canal. Thus, the contralateral inferior part of the superior lamina and a part of the base of the spinal process can be removed with the use of the burr. By doing so, the ligamentum flavum spanning both side of the canal can be seen with the epidural fat in the midline. In the next step, the flavectomy is performed firstly contralateral starting from the midline. Then, the ipsilateral flavectomy follows. The flavum is resected cranially towards its insertion line at the lamina. To proof the adequate decompression cranially the disc was exposed. Then the decompression was performed towards the caudal lamina with exposing the roots on both sides, followed by a decompression of the foramen. The relieved nerve course to all directions (caudal, cranial and into the neuroforamina) is proofed with a hook.

In the second level a slightly different method was used: After bony decompression of the ipsilateral side, the flavectomy and decompression is performed on the ipsilateral side first. Then, the contralateral side is decompressed with high-speed burr and Kerrison rongeur by tilting the table to the contralateral side. The rest of the surgery is then equally performed like described above.

The wound is closed as usual (fascial, subcutaneous, skin) with a subfascial redon drainage because of two level operation.

Postoperative information

The patient recovered quickly and could be mobilized 6 h after operation. The drain was removed on the second postoperative day. There was no sensomotoric deficit. Patient reported of a significant decrease of the claudication symptomatic. The patient left the hospital on the third postoperative day. At the follow-up visit 6 weeks later there was a further decrease of the claudication symptomatic. No radiological examinations are routinely performed.

Discussion and conclusion

With an aging population the diagnosis of degenerative lumbar spinal stenosis increases [2]. The results of a surgical treatment in consistent pain or deficit are mainly better than the results in conservative treatment [3]. However, a conservative treatment approach should be performed first because there is still a good outcome even for later operations [3].

Although several studies showed good results for bilateral decompression via unilateral approach [1, 4] it is still unclear which technique is the best for decompression of spinal stenosis [4, 5].

As it is less invasive and the outcome is good we favor the unilateral microscopic approach with bilateral decompression for spinal stenosis.

Compliance with ethical standards

Conflict of interest None.

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