

Translaminar Approach To Herniated Lumbar Discs In Old Patients With Degenerative Spondylolisthesis

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Citation

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Abstract

In increasing frequency, we are confronted with very old patients presenting with symptomatic degenerative spinal diseases. Many of these patients have significant comorbidity and minimally invasive treatment strategies are desirable. We report the case of an 87-year old woman with intolerable radicular pain caused by large disc herniation with intraforaminal extension in the presence of degenerative spondylolisthesis. Due to significant comorbidity, a translaminar approach was chosen for microdiscectomy to limit the duration of surgery, avoid arthrectomy and, therefore, minimize the risk of increasing hypermobility. After 6 months, the patient was free of pain, imaging studies showed an unchanged degree of spondylolisthesis. In patients with lumbar disc herniation and degenerative spondylolisthesis with significant comorbidity, a translaminar approach should be considered as an alternative to decompression and instrumentation in order to minimize the operative risk and retain the maximum possible stability.

INTRODUCTION

At present, microdiscectomy is considered the standard treatment for lumbar disc herniation.^{1,8} Some evidence suggests that the sole removal of a herniated disc fragment with less extensive bone removal and less injury to the facet joints is equal to or even of advantage over a standard microdiscectomy regarding long-term outcome.^{2,3,14,17} However, this is still debated controversially.^{6,11} Classically, microdiscectomy is performed via an interlaminar approach. For cranially and intraforaminally dislocated disc fragments, this approach implicates more extensive facetectomy and bone removal in the pars interarticularis. In 1998, Di Lorenzo proposed treatment for upward herniated and foraminal disc fragments via a “translaminar fenestration” in order to spare the facet joint and minimize the risk of postoperative instability.⁵

In increasing number, we observe very old patients with various degenerative spinal disorders including degenerative spondylolisthesis with disc herniation. If significant neurological deficits develop or analgetics cannot alleviate excruciating pain, operative therapy is indicated even in these patients. However, preoperative risk evaluation might make extensive neural decompression and spinal instrumentation undesirable and limited procedures

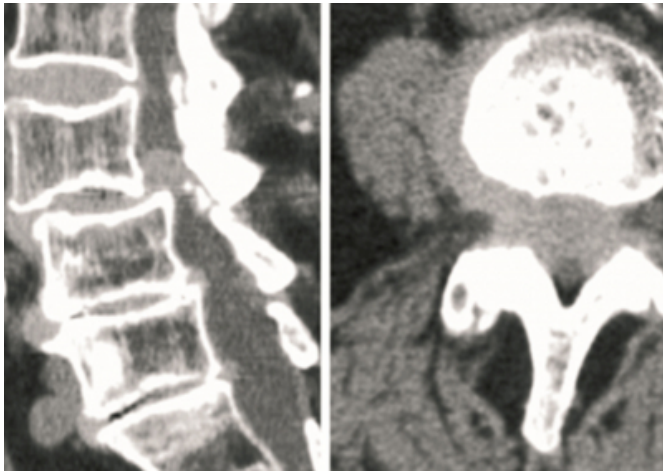
preferable. We present the case of an 89-year old woman with spondylolisthesis and foraminal disc herniation treated by a translaminar approach.

CASE ILLUSTRATION

An 89-year-old female was admitted with severe right-sided sciatica projecting to the L3-Dermatoma without neurological deficit. Conservative measures including intravenous analgesia and administration of corticoids did not result in sufficient pain relief. A CT-scan of the lumbar spine depicted degenerative spondylolisthesis and foraminal disc herniation at L3/4 (Figure 1a and b). Due to excruciating pain which was untreatable by conservative measures, surgery was indicated. Co-morbidity included chronic heart failure, hypertension, and coronary artery disease. 3 months before, the patient had suffered ischemic cerebral apoplexy. The significant co-morbidity made an extensive operative procedure under general anesthesia appear unfavorable and the presence of osteoporosis further opposed a wider decompression with instrumentation.

Figure 1

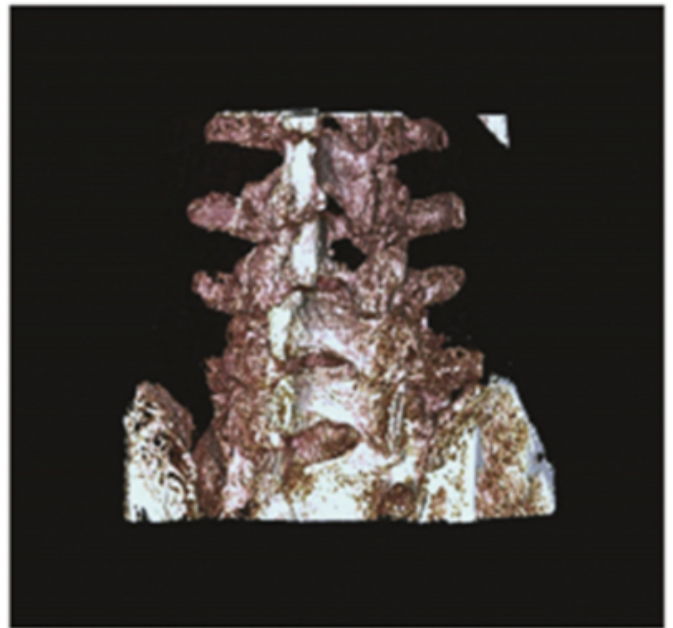
Figure 1a and b: Preoperative CT-scans depicting a large herniated disc fragment with upward and foraminal extension and degenerative spondylolisthesis.



The herniated disc fragment was removed via a translaminar approach. Under the operation microscope, a 10 mm hole was drilled into the lamina of L3 using a high-speed drill. The thecal sac and the exiting nerve root were dissected and the large herniated disc fragment was mobilized and removed. After removal of the disc fragment, the nerve root exited the foramen freely, without any compression. However, more disc material was pouring out of the disc space through a large perforation site in the anulus. By a slight caudal extension of the translaminar fenestration (Figure 2), good access could be gained to the intervertebral space and the nucleus was removed.

Figure 2

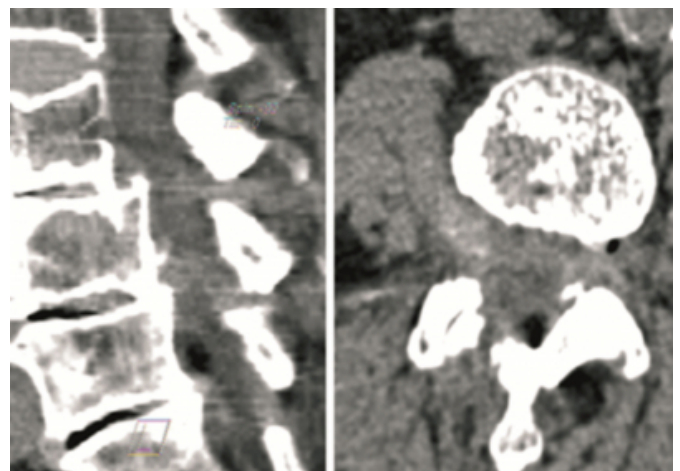
Figure 2: 3-D reconstruction of a postoperative CT-scan depicting the extent of the translaminar approach in the lamina of L3.



After surgery, the patient was free of pain, without a neurological deficit and able to get up the same afternoon. The postoperative course was uneventful. At a 6-month follow-up examination, the patient had still no recurrence of pain. A CT-scan of the lumbar spine showed no recurrent disc hernia and no progression of the spondylolisthesis (Figures 3 a and b)

Figure 3

Figure 3 a and b: Postoperative CT-scan depicting the translaminar fenestration and removal of the disc fragment. The degree of spondylolisthesis remained unchanged compared to preoperative imaging studies.



DISCUSSION

The removal of upward and foraminal herniated lumbar disc fragments via a translaminar approach has been discussed as an alternative to the standard microdiscectomy via an interlaminar approach with the advantage of minimizing the extent of bone removal on the facet joints and in the pars interarticularis.^{5,10,16} Although it is not proven by firm evidence that this alternative approach will prevent long-term secondary instability better than the standard procedure,¹³ the fact that the injury to the architecture of the dorsal column is minimized suggests that the risk of a destabilization of the spine is reduced. In the patient reported here, degenerative spondylolisthesis was already present prior to surgery. The sudden-onset radicular pain with only minor back pain, however, was clearly caused by an upward herniated disc fragment. In a younger patient or a patient with less co-morbidity, a standard decompression via an interlaminar approach or laminectomy, discectomy and posterior instrumentation would be the procedure of the first choice.

With increasing life expectancy, an increasing number of very old patients is admitted to our departments with disc herniation, spinal stenosis and/or degenerative spondylolisthesis. However, very old patients tend to have significant operative and anesthesiological risk factors.¹² Osteoporosis bears the risk of fractures after decompression and might endanger the fixation of pedicle screws. Cardiovascular or cerebrovascular diseases inhere a higher risk of anesthesiological or neurological complications which rises with the duration of the operative procedure and the duration of anesthesia.^{7,9} Finally, extensive operative procedures in old patients are often followed by a prolonged period of immobilization or at least of decreased mobility bearing a high risk of thrombosis and pulmonary embolism.^{4,9} Limited operative procedures, therefore, appear preferable.

Primarily, the translaminar approach targets on foraminal disc herniation. Recently, the removal of a caudally herniated free disc fragment via the lower lamina has been reported by Seiz et al.¹⁵ Due to the increasing craniocaudal extension of the lamina in higher lumbar levels,¹⁰ these levels are even more suitable for this approach. We found that the intervertebral space is well accessible at L3/4 by a translaminar approach.

The approach unites two advantages. First, it reduces the injury to load-bearing structures to a minimum. Second, the

procedure can be performed very quickly. An open extraforaminal approach and an endoscopic transforaminal approach have to be discussed as valid alternatives under these particular circumstances. Both alternatives can also be performed quickly and with an acceptable operative risk. However, there are drawbacks for both of those procedures. To visualize the nerve root and dissect the herniated disc fragment, lateral facetectomy is frequently required during an open extraforaminal approach, especially if major parts of the disc fragment are not in extraforaminal location. This imposes, again a risk on segmental stability. An extraspinal open approach, therefore, is not ideal. Visualization might be better with the use of an endoscope. However, due to the anterolisthesis, the nerve root is exiting in a groove formed by the posterior margin of the lower vertebra, the pedicle of the upper vertebra and the facet joint with the disc fragment being located anterior to the root. For an extraforaminal endoscopic approach, the herniated disc fragment is locked by these structures. Therefore, a safe removal by a lateral or endoscopic approach also seems difficult. Via the translaminar route, in contrast, the herniated disc fragment can be dissected from inside the spinal canal starting in the axilla of the nerve root and can be removed with a minimum of manipulation and a low risk of damage to the nerve root.

By the translaminar approach to upward and intraforaminally herniated discs, the duration of surgery can be kept very short, the risk of further instability in preexisting degenerative spondylolisthesis minimized, the nerve root safely dissected, and good access gained to the intervertebral space. If radicular pain or neurological deficits are caused by a herniated lumbar disc in the presence of degenerative spondylolisthesis and the patient is burdened with a high perioperative risk, discectomy via a translaminar approach should be considered as an alternative to standard decompression and fusion to keep the operation short and maintain the maximum stability.

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