Transdural Discectomy Lumbar Region: A retrospective series of 10 cases

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Citation

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Abstract

Over the past Ten years more than 500 Lumbar discectomies have been performed by the senior author through all standard methods, but only ten patients underwent Transdural disc excision. Seven males and three females in age group of 18 - 58 yrs were treated by this method. Six patients had PIVD at L4-L5 level, 3 at L5-S1 and one patient had PIVD at two levels L2-L3 and L3-L4.Results were evaluated by postoperative Frankel's grading, relief from pain, sensory improvement, return of bowel and bladder functions and complications. We achieved excellent results as for as relief of sciatica was concerned. Full recovery in motor and sensory symptoms was observed in 80% (n = 8) cases. One patient of cauda-equina syndrome did not recover and one patient developed headache due to CSF leak.

INTRODUCTION

Intradural disc herniation is one of the very less reported condition in the literature. It comprises of only 0.26-0.30 % of all cases of disc herniation and is dreadful complication of prolapsed intervertebral disease (1, 2). Since this condition was described by Dandy (3) in 1942, more than 100 cases of intradural disc herniation have been reported in the literature (4). Overall 92% of the total cases occur at the lumbar region where as 5% are found in the thoracic and 3% in the cervical region (2, 4). L3-L4 and L4-L5 disc spaces are the involved discs in majority (92%) of the cases with high disc herniations constituting just over 17% of the total cases of lumbar intradural disc herniation { L1-L2 (8%) and L2-L3 (9%) } (5). Excision of a lumbar intradural disc without causing much retraction on cauda equina and exiting nerve roots can be done by transdural approach. A review of the literature revealed very few isolated case reports of deliberate transdural disc excisions of Lumbar region. We present a series of 10 cases of transdural discectomies for Lumbar PIVDs.

MATERIAL AND METHODS

A retrospective review of over 500 Lumbar disc removals by the senior author spread over past 10 years (1999- 2008) only 10 patients were found to have undergone transdural disc excision. Seven males and three females in age group of 18 yrs - 58 yrs were found to have been treated by this approach. Majority of patients (80%) had combined symptoms of sciatica, and lowbackache not responding to conservative treatment. Four patients (40%) had acute cauda equina syndrome at presentation. The patients neurological status was checked according to Frankel's grading (Table 1). All the patients were taken up for surgery within one week with 3 of the cauda equina patients being operated within 48 hours of admission. Six patients (60%) had PIVD at L4-L5 level, 3 at L5-S1 and one patient had PIVD at two levels L2-L3 and L3-L4. Due to unavailability of MRI in early days decision to go transdural had been taken per-operatively. But in later part of the study MRI scanning permitted identification of massive intadural or posterocentral disc herniation and transdural approach was kept as a definite option. Though in all patients, the final decision to go transdural was taken per operatively, after finding it difficult to remove the disc by usual lateral extradural exploration.

Surgical Approach: Laminectomy was done in all these ten cases by usual posterior midline approach. Dura was visualized and midline bulge gently palpated. Mid line incision over disc bulge was given. We routinely placed fine sutures through either edge of dorsal dura at proximal and distal corners before excision of disc to facilitate vision of field and easy repair after disc excision. Cauda equine fibers were gently retracted to either side and disc was excised. Dura was closed, muscles and fascia were stitched separately with out any drain. We did not use any posterior stabilization. Close monitoring of BP, pulse and any CSF leakage sign was done

postoperatively. All Patients were followed twice weekly for initial 3 months, every month thereafter for 6 months and then once every 3 months for 2 years.

RESULTS

All patients were evaluated postoperatively by Frankel's grading, relief of pain, sensory improvement, return of bowel and bladder functions and complications. We achieved excellent results as for as relief of sciatica was concerned in majority of patients. Full recovery in motor and sensory symptoms was observed in 80% (n = 8) cases (Table1).

Figure 1

TABLE NO: 1

Frankel's Grade	Pre-operative		Post-operative	
	No. of Patients	Percentage	No. of Patients	Percentage
A	4	40	1	10
B	4	40	0	-
C	2	20	0	-
D	0	-	1	10
E	0	-	8	80

Neurological Improvement in the patients of lumbar PIVD who underwent Transdural

discectomy (n=10)

Out of four patients of acute cauda syndrome three recovered neurologically. One patient of cauda-equina syndrome did not recover. One of the patients developed headache due to CSF leakage, was managed conservatively. No patient developed post operative discitis, post operative worsening of neurodeficit or any other major complications needing re-exploration. No patient developed significant spinal instabilities or post operative deformity.

Figure 2

Fig1. MRI finding of lumbar Intradural disc herniation

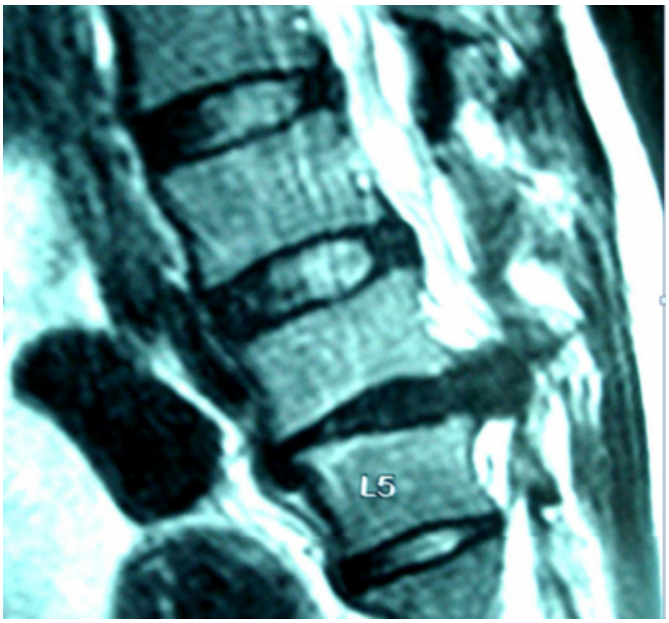
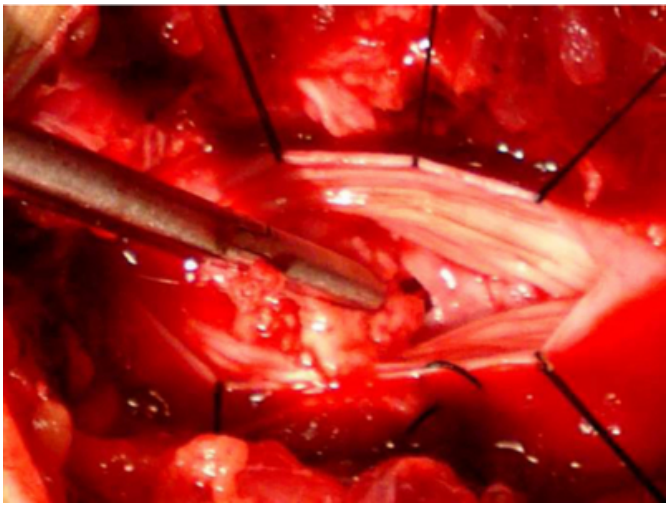


Figure 3

Fig2 .Transdural excision of Disc.



DISCUSSION

Although the pathogenesis of intradural disc herniation is not understood, a number of theories have emerged over the years seeking to explain this unexpected occurrence. Intradural disc herniation has to perforate the annulus fibrosus, posterior longtudinal ligament and the ventral dura mater (6). Dandy (1942) hypothesized initially that the sudden pressure created by a herniated disc leads to erosion and penetration of the underlying dura. Blikra (7) studied the relationship between the ventral dura and the posterior longitudinal ligament and found frequent dense adhesions between the two structures. He concluded that the

connection between the ventral dura, the posterior longitudinal ligament, and the annulus fibrosis of the disc was so firm that a herniated disc could penetrate through them as if they were one structure. The adhesions were prominent in our cases. Preexisting degenerative spondilotic changes and the chronic herniated disc may have contributed to adhesions. Adhesions are thought to develop from a number of different mechanisms including chronic irritation from a herniated disc (8), previous surgery (9) chronic local inflammation, or congenital/iatrogenic factors. Generally patients with intradural disc rupture tend to have more severe neurological symptoms than would be expected from an uncomplicated herniated disc. Cauda equina syndrome in particular has been found in 30% (4), to 60% (10) of patients with intradural lumbar disc herniations. In addition to lower extremity weakness and sensory deficits, these patients often develop other symptoms typical of cauda equina syndrome such as saddle anesthesia or bladder and bowel dysfunction. Howewer, there may be cases where the disc protrudes intradurally to compress a single root and show signs only of root compression. CT and postmyelogram CT can provide valuable information regarding intradural lumbar disc herniation. In the myelographic examination, intradural disc herniations of the lumbar region usually show as a complete block (11). The potential presence of an intradural disc herniation must always be considered preoperatively on a patient whose magnetic resonance imaging study demonstrates the “hawk-beak sign” on axial imaging as well as abrupt loss of continuity of the posterior longitudinal ligament (12).

Although MR imaging is an effective diagnostic tool, intradural disc herniations continue to be diagnosed most frequently intraoperatively. The site most frequently affected is L4-5 (55%), followed by L3-4 (16%) and L5-S1 (10%) (13,14). Despite its infrequent occurrence, disc herniation must be entertained in the preoperative diagnosis of patients who present with neurological deficits and in whom intradural mass lesions of the lumbar spine are revealed radiographically. Early surgery should be offered to provide the best opportunity for full neurological recovery (15).

Treatment of intradural lumbar disc herniations requires dorsal duratomy and removal of all ruptured disc material. Intradural disc need to be recognized and treated appropriately at the time of the initial operation to prevent the development of the back failure (16, 17). As a result, during the disc operation, every surgeon involved in spinal surgery must be aware of this rare pathology which, when overseen during the intervention, could have disastrous consequences for the patient (18).

The most important prognostic factor for which patients will likely achieve full recovery, besides the adequacy of disc removal during surgery, is the preoperative duration of neurologic symptoms. Shorter duration strongly correlates with better outcome. It is therefore essential, that these patients be both diagnosed early in the disease process and treated with prompt surgical intervention.

CONCLUSION

Transdural approach is very useful one for excision of intradural discs and in cases of massive posterocentral disc herniations adhered to ventral dura and hence should definetly be kept as an option. It decreases the chances of iatrogenic injuries to roots or cauda itself due to excessive retraction during extradural exploration.

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