

Extraforaminal Intradiscal Disc Herniation. Case Report

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Abstract

Background data: The intradiscal penetration of a disc fragment was first reported in 1984 and is much less frequent than the intradural disc herniation. Both types of disc herniation are predominantly found in lumbar spine and rarely in the thoracic and cervical spine. The pathogenesis of lumbar intradural disc herniation is most likely related to dense adhesions between the ventral dura mater and the posterior longitudinal ligament. The adhesions can apparently result either from repeated minor trauma or from prior surgery.

Purpose: In this report, the authors presented the first case of extraforaminal intradiscal disc herniation, which was at first misdiagnosed as a schwannoma, and suggested a new classification for the intradural disc herniations.

Study design: Case report.

Methods: Clinical and radiological examination of a case of extraforaminal intradiscal disc herniation is presented.

Results: In our case the MRI had shown an extraforaminal lesion at the region of L3. As the possibility of extraforaminal intradiscal disc herniation is very remote, the diagnosis of schwannoma was made. However, the diagnosis was then proved by histopathology to be intradiscal disc herniation. Because of this new category of intradiscal disc herniation, we modified the classification of intradural disc herniation into type A: intradural disc herniation (IDH); type B: Intraforaminal intradiscal disc herniation (IIDH); and type C: Extraforaminal intradiscal disc herniation (EIDH).

Conclusions: When the diagnosis is suspected of an extraforaminal nerve root tumor, we should not forget the possibility of intradiscal disc herniation and the removed material should be sent to the histopathological examination to confirm the diagnosis. (2012ESJ001)

Key Words: Intradural, intradiscal, extraforaminal, disc herniation.

Introduction

In 1942, Dandy described the first intradural disc prolapse in a review of 300 cases⁵. The lumbar intradural (IDH) and intradiscal disc herniation (IRDH) is a rare event. Nearly 123 cases of intradural disc herniation have been reported until 2004^{3,4,9}. The incidence of IDH ranges between 0.19–1.10 %^{8,12}. The intradiscal penetration of a disc fragment was first reported in 1984¹ and it is a much less frequent than the IDH. Both types of disc herniation are predominantly found in

lumbar spine and rarely in the thoracic and cervical spine^{10,14}. The pathogenesis of lumbar intradural disc herniation is most likely related to dense adhesions between the ventral dura mater and the posterior longitudinal ligament. The adhesions can apparently result either from repeated minor trauma or from prior surgery^{10,13}. In this report, the authors present the first case of extraforaminal intradiscal disc herniation which was at first misdiagnosed as a schwannoma and suggest a new classification for the intradural disc herniations.

Case report:

A 48 years old male patient presented with a history of low back pain and left leg pain for 3 weeks. The leg pain was more annoying and disturbing than the back pain. He did not show any improvement with the different analgesics. There was no history of trauma or previous surgery.

Clinical examination:

Neurological examination revealed weakness of left quadriceps muscle M4, paresthesia on the left thigh and decreased left knee reflex. Femoral nerve stretch test was positive on the left side.

Imaging studies:

Magnetic Resonance Imaging (MRI) with contrast material showed a lesion in the area of left L3 nerve

root (Figure. 1 and 2). The lesion was diagnosed by the radiologist as a schwannoma of L3 nerve root.

Surgery:

Lateral transmuscular Wiltse approach¹⁵ to explore the extraforaminal part of L3 on the left side. The nerve root was not fixed to the underlying posterior longitudinal ligament. The perineurium was longitudinally opened posteriorly and soft tissue fragments were removed from inside the nerve. These fragments were similar to the white gray disc material (Figure. 3). After removal of these fragments, a small hole was detected in the anterior part of the nerve root. The material was sent for histopathological examination which proved that these fragments were disc fragments and not a schwannoma.



Figure 1: Pre-operative MRI, axial view, T2 weighted image with a lesion at the level of left L3 extraforaminal (marked by the arrow).



Figure 2: Pre-operative MRI, coronal view, showing the same lesion (marked by the arrow).

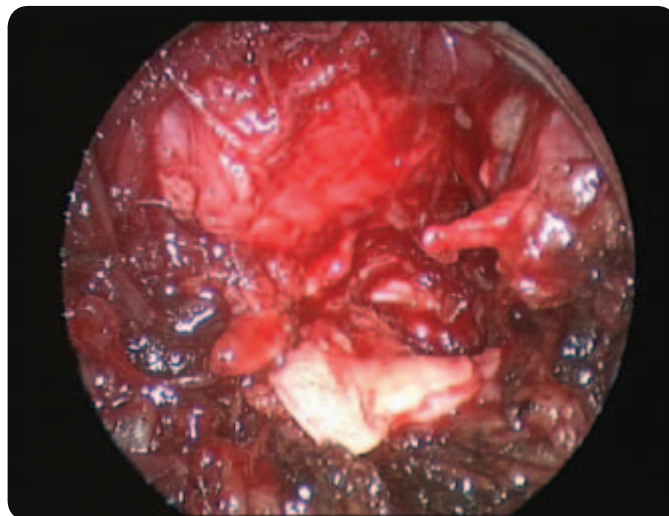


Figure 3: Intra-operative photo showing the disc material after opening the root sleeve longitudinally.

Post-operative course:

After surgery, the patient showed marked improvement of the annoying radicular pain together with less intense tingling sensation. He continued to suffer from burning sensation in his left leg which improved markedly after 3 months from the operation.

Discussion

Intr radicular disc herniation is a very rare condition. Barbera¹ was the first to report it in 1984 and from that time till 2007 only 11 cases were reported in the literature¹². S1 root was involved in most of the cases and L5 was affected only once¹¹. Our case is the first one reported in the literature where the intr radicular disc herniation was extraforaminal affecting L3 nerve root. The diagnosis of IRDH is always made intraoperatively. An irregular filling defect on myelography may be a sign of IDH⁶. MRI is superior to myelography in making the diagnosis of IDH⁷. In our case the MRI had shown an extraforaminal lesion at the region of L3. As the possibility of extraforaminal intr radicular disc herniation is very remote, the diagnosis of schwannoma was made. However, the diagnosis was then proved by histopathology to be intr radicular disc herniation.

The actual mechanism behind IRDH is still not well known but many theories do exist trying to explain this rare condition. One of these theories depends on the anatomical characteristics of the nearby anatomical structures. For example, the dura may be congenitally thin and easily penetrable¹, or weak secondary to degenerative processes in the elderly¹². Congenital or acquired adhesions between the posterior longitudinal ligament and nerve root can also promote IRDH^{2,13,16}. The adhesions fix the nerve root and do not allow it to escape from the disc herniation. However this cannot explain the mechanism in our case, as there were no adhesions between the nerve root and the surrounding tissues. We think that in this case, the mechanism of intr radicular disc herniation depends on the physical properties of the herniated disc fragment. When a hard disc fragment with tapered end is herniated under local pressure, it will be able to penetrate through the nerve root sleeve⁵. This theory explains the presence of a penetration hole in the anterior part of the nerve root (facing the disc) as detected intraoperatively. Because of this new category of intr radicular disc herniation, we modified the classification of

intradural disc herniation which was mentioned by Mut et al in 2001¹⁰. The modified classification includes. Type A: intradural disc herniation (IDH); Type B: Intraforaminal intr radicular disc herniation (IIDH); and Type C: Extraforaminal intr radicular disc herniation (EIDH).

Conclusions

The pre-operative diagnosis of extraforaminal intr radicular disc herniation is almost impossible because of the rarity of this lesion. When the diagnosis of an extraforaminal nerve root tumor is suspected, we should not forget the possibility of intr radicular disc herniation, and the removed material should be sent to the histopathological examination to confirm the diagnosis. Surgical removal of the extraforaminal intr radicular disc herniation will be followed by immediate improvement of the symptoms.

References

- 1) Barbera j, Gonzalez-Darder J, Garcia-Vazquez F. Intr radicular herniated lumbar disc. J Neurosurg; 60: 858-860, 1984.
- 2) Blikra G. Intradural herniated lumbar disc. J Neurosurg; 31: 676-679, 1969.
- 3) Ciapetta P, Delfini R, Contorew GP. Intradural lumbar disc herniation: description of three cases. Neurosurgery; 8:104-107, 1981.
- 4) D'Andrea G, Trillo G, Roperto R, Celli P, Orlando ER, Ferrante L. Intradural lumbar disc herniations: the role of MRI in preoperative diagnosis and review of the literature. Neurosurg Rev; 27: 75-80, 2004.
- 5) Dandy WE. Serious complications of ruptured intervertebral disks. JAMA; 119: 474-477, 1942.
- 6) Hodge CJ, Binet EF, Kieffer SA. Intradural herniation of lumbar intervertebral discs. Spine; 3: 346-350, 1978.
- 7) Holtas S, Nordström CH, Larsson EM, Petterson H. MR imaging of intradural disc herniation. J Comput Assist Tomogr; 11: 353-356, 1987.
- 8) Kataoka o, Nshibayashi, Sho T. Intradural lumbar disc herniation: report of three cases with a review of literature. Spine; 14; 529-533, 1988.
- 9) Lee JS, Suh KT. Intradural disc herniation at L5-S1 mimicking an extramedullary spinal tumor: A case report. J Korean Med Sci: 21: 778-780, 2006.
- 10) Mut M, Berker M, Palaoglu S. Intr radicular disc herniations in the lumbar spine and a new classification of intradural disc herniation.

- Spinal Cord; 39: 545-548, 2001.
- 11) Nazzal MM, Croissant PD, Ali MA, Kaidi AA. Intraradicular disc herniation: a case report and review of literature. J Spinal Disord; 8: 86-88, 1995.
 - 12) Özer E, Yurtsever C, Yücesoy K, Güner M. Lumbar intraradicular disc herniation: report of a rare and preoperatively unpredictable case and review of literature. Spine J; 7: 106-110, 2007.
 - 13) Spencer DL, Irwin GS, Miller JA. Anatomy and significance of fixation of the lumbosacral nerve roots in sciatica. Spine: 8: 672-679, 1983.
 - 14) Süzer T, Tahta K, Coskum E. Intraradicular lumbar disc herniation: Case report and review of literature. Neurosurgery; 41:956-959, 1997.
 - 15) Wiltse LL, Bateman JG, Hutchinson RH, Nelson WE. The paraspinal sacrospinalis-splitting approach to the lumbar spine. J Bone Joint Surg. Am; 50A: 919-926, 1968.
 - 16) Yildizhan A. intradural disc herniation: pathogenesis, clinical picture, diagnosis and treatment. Acta Neurochir (Wien); 110: 160-165, 1991.

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الملخص العربي

المقدمة: الانزلاق الغضروفي داخل جذر العصب قد تم اكتشافه لأول مرة عام ١٩٨٤ وهو اقل نسبة من الانزلاق الغضروفي داخل الأم الجافية والذي ينتج عادة من التصاقات بين الرباط الطولى الخلفى والأم الجافية. الهدف: يعرض المؤلفان حاله من الانزلاق الغضروفي داخل جذر العصب والتي تم تشخيصها خطأ على أنها ورم بالعصب. الطرق: الفحص الإكلينيكي وكذلك فحص بالإشاعات للحالة. النتائج: فى هذا التقرير كان تشخيص الحالة ورم بجذر العصب القطنى الثالث وعند التدخل الجراحى لإزالة الورم اكتشفنا أنه إنزلاق غضروفي وقد تم إثبات ذلك عن طريق تحليل العينه. الإستنتاج: عند الإشتباه بورم جذر العصب لا بد أن يوضع بالإعتبار إحتماالية الانزلاق الغضروفي داخل العصب وللتأكد لابد من تحليل العينه.