



Case Report

Traumatic lumbar disc extrusion mimicking spinal epidural hematoma: Case report and literature review

Luigi Basile^{1,2}, Lara Brunasso^{1,2}, Rosa Maria Gerardi³, Rosario Maugeri^{1,2}, Domenico Gerardo Iacopino^{1,2}, Carlo Guli^{1,2}, Maria Angela Pino^{1,2}, Silvana Tumbiolo⁴, Giovanni Federico Nicoletti⁵, Francesca Graziano^{2,5}

¹Department of Neurosurgery, Neurosurgical Clinic, AOUP "Paolo Giaccone", Post Graduate Residency Program in Neurosurgery, ²Department of Experimental Biomedicine and Clinical Neurosciences, School of Medicine, Palermo, ³Department of Neuroscience, Division of Neurosurgery, Reproductive and Odontostomatological Sciences, Napoli, ⁴Department of Neurosurgery, Villa Sofia Hospital, Palermo, ⁵Department of Neurosurgery, ARNAS Garibaldi, Catania, Italy.

E-mail: Luigi Basile - lbasile64@libero.it; *Lara Brunasso - lara.brunasso@community.unipa.it; Rosa Maria Gerardi - rosamariagerardimd@gmail.com; Rosario Maugeri - rosario.maugeri1977@gmail.com; Domenico Gerardo Iacopino - gerardo.iacopino@gmail.com; Carlo Guli - carloguli81@gmail.com; Maria Angela Pino - mariaangelapino@live.it; Silvana Tumbiolo - tumbiolosilvan@yahoo.it; Giovanni Federico Nicoletti - gfnicoletti@alice.it; Francesca Graziano - fragraziano9@gmail.com



*Corresponding author:

Lara Brunasso,
Department of Neurosurgery,
Neurosurgical Clinic, AOUP
"Paolo Giaccone", Post
Graduate Residency Program in
Neurosurgery, Department of
Experimental Biomedicine and
Clinical Neurosciences, School
of Medicine, Palermo, Italy.

lara.brunasso@community.
unipa.it

Received : 05 July 2020

Accepted : 29 September 2020

Published : 21 October 2020

DOI

10.25259/SNI_407_2020

Quick Response Code:



ABSTRACT

Background: Because the neurological presentation of spinal epidural hematomas (SEH) is often not specific, they may be misdiagnosed as acute lumbar disk herniations. Here, we present a case in which a traumatic disc extrusion mimicked an epidural hematoma and reviewed the appropriate literature.

Case Description: A 27-year-old male sustained a high-energy fall. The lumbar MRI scan showed a L4-S1 ventral medium/high signal intensity mass on the T1- and high signal intensity lesion on T2-weighted images; the original diagnosis was spinal epidural hematoma. However, at surgery, consisting of a left L4 and L5 hemilaminectomy with L4-L5 and L5-S1 laminotomy, an extruded lumbar disc was encountered at the L4-L5 level and removed; no additional pathology or SEH was found at either level.

Conclusion: On MR, SEH may mimic acute lumbar disk herniations. Depending on the clinical symptoms/signs, surgical intervention will both correctly confirm the diagnosis and relieve neural compression.

Keywords: Extruded disc herniation, Magnetic resonance imaging, Spinal epidural hematoma, Traumatic disc extrusion

INTRODUCTION

Trauma, coagulation disorders, spine surgery, and/or lumbar spinal punctures/epidural injections are the major factors predisposing patients to developing spinal epidural hematomas (SEH).^[1,3-5,12] The clinical presentation for SEH typically includes acute low back pain, progressive symptoms and signs of spinal cord/nerve root compression, and intermittent neurogenic claudication. Acute lumbar disk herniations that mimic the presentation of SEH may, therefore, remain unrecognized. Here, we present a 27-year-old male who following a fall was originally diagnosed with a L4-S1 SEH that proved at surgery to be an acute disc extrusion and reviewed the appropriate literature.

CASE REPORT

A 27-year-old man presented with a high-energy fall who presented with a severe paraparesis and bilateral hypoesthesia in both lower extremities.

This is an open-access article distributed under the terms of the Creative Commons Attribution-Non Commercial-Share Alike 4.0 License, which allows others to remix, tweak, and build upon the work non-commercially, as long as the author is credited and the new creations are licensed under the identical terms.

©2020 Published by Scientific Scholar on behalf of Surgical Neurology International

MR findings

The spine lumbosacral MRI scan showed a bilateral, longitudinally oriented mass in the anterior epidural space between the posterior walls of L4 down to S1. It markedly compressed both the cauda equina and anterior L5 and S1 nerve roots [Figure 1]. The posterior longitudinal ligament also demonstrated a medium/high signal on T1-weighted images and high signal in T2-weighted images. The original radiological diagnosis was SEH.

Surgery

Through a left L4 hemilaminectomy and L4-L5 foraminotomy, a large disc fragment was found that had migrated inferiorly below both L5 roots. The disk fragment was removed, and a L4-L5 microsurgical discectomy was completed; there was no epidural hematoma. The same procedure was performed at L5-S1 where the posterior longitudinal ligament appeared similarly disrupted but there was no additional disc fragment or epidural hematoma. Postoperatively, the patient exhibited slight recovery of lower limbs motor and sensor function, improvement being noted predominantly on the right side. The postoperative lumbar MRI confirmed adequate canal decompression without any further lesions being identified [Figure 2].

DISCUSSION AND LITERATURE REVIEW

MRI findings are the most reliable for diagnosing traumatic disc herniations. Traumatic disc herniation is most evident on T2-weighted images that usually have low signal intensity

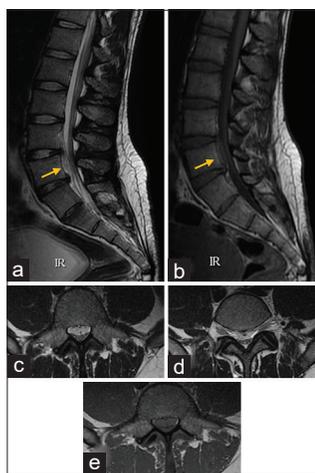


Figure 1: Sagittal T2-weighted (a) and sagittal T1-weighted (b) MRI showed a longitudinally oriented mass-like lesion in the anterior epidural space (arrow). The mass presented with high signal intensity on T2-weighted images and medium/high signal intensity on T1-weighted images. Axial T2-weighted (c and d) and axial T1-weighted (e) MRI showed that the dural sac was compressed by the ventral mass.

on T2-weighted and a high signal intensity on T1-weighted images. Morphological changes to the disc resulting in signal alterations on MRI depend on the severity of the trauma. T2-weighted MRI can also reveal hyperintense cord contusions from the compression and stripping of the posterior longitudinal ligament.^[13]

The MRI findings of acute SEH have been described differently showing isointense or hypointense signals on T1-weighted images (whereas subacute and chronic hemorrhages have a hyperintense appearance on T1-weighted images) and heterogeneity or mixed high/low signals on T2-weighted studies. Notably, traumatic disc herniations, unlike epidural hematomas, usually regress in size over time.^[2,3,5-7,10,11,14]

In our patient, the herniated mass showed a medium/high SI on the T1-weighted MRIs and high SI on T2-weighted MRIs [Figure 1]. The SI pattern on MRI we observed was the same as that of blood, and this led us to support the preliminary diagnosis of SEH.

We identified four similar reports of traumatic lumbar disk herniation mimicking epidural hematomas and we reported a table with comparable cases [Table 1].^[7,8,9,13] Three of the abovementioned authors performed bilateral hemilaminectomy at the disc herniation level^[7,8,13] while Kim *et al.* performed right hemilaminectomy at the disc herniation level with percutaneous screw fixation of L3-5.^[9]

In spine trauma, conservative management is generally accepted as a first-line of management in cases without neurologic injury or gross instability. Typically, surgical intervention is required as the presence of neurological deficits.

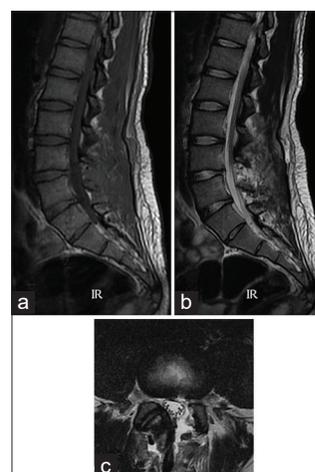


Figure 2: Sagittal T1-weighted and T2-weighted (a and b) MRI showed the complete removal of the herniated lumbar disk and no residual signs of the preoperative longitudinally oriented mass-like lesion in the anterior epidural space. Axial T2-weighted (c) MRI showed neither dural sac nor nerve compression.

Table 1: Literature review of clinical and MRI findings of disc herniation mimicking spinal epidural hematoma.

Author, year	Patient's age, sex	Trauma history	Level of disc herniation	T1-weighted RMI	T2-weighted RMI	Disc herniation pattern	Additional findings	Surgical procedure
Our study, 2019	27 yo, M	High-energy fall spinal trauma	L4-L5	Mixed (medium/high)	High	Huge migrated extrusion downward below the L5 root	Longitudinal shape	Left hemilaminectomy at L4-L5, foraminotomy at L4-L5 and L5-S1 levels, microdiscectomy at L4-L5
Kim et al., ^[9] 2019	39 yo, M	Crushing injury due to crane collapse	L3-L4	Iso	Mixed (high/low)	Ventral to dura upward migration	Peripheral hyperintensity on T1WI, longitudinal shape	Right hemilaminectomy at L3 level, percutaneous screw fixation of L3-5
Jain et al., ^[7] 2018	50 yo, M	Hit his back on a tree branch	L2-L3	Iso	Mixed (low/high)		Peripheral hyperintensity on T1WI, longitudinal shape	Laminectomy at L2-L3
Kil and Park, ^[8] 2017	57 yo, M	Epidural nerve block	L2-L3	Iso	Low	Dorsolateral to dura protrusion		Laminectomy at L2
Song et al., ^[13] 2012	23 yo, M	Traffic accident	L4-L5	Low	Mixed (high/low)		High signal rim around mass on T1WI	Bilateral hemilaminectomy at L4 level

CONCLUSION

On MR, SEH may mimic acute lumbar disc herniations. Depending on the clinical symptoms/signs, surgical intervention will both correctly confirm the diagnosis and relieve neural compression.

Declaration of patient consent

Patient's consent not required as patients identity is not disclosed or compromised.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

REFERENCES

- Bennett DL, George MJ, Ohashi K, El-Khoury GY, Lucas JJ, Peterson MC. Acute traumatic spinal epidural hematoma: Imaging and neurologic outcome. *Emerg Radiol* 2005;11:136-44.
- Brinckmann P. Injury of the annulus fibrosus and disc protrusions. An *in vitro* investigation on human lumbar discs. *Spine (Phila Pa 1976)* 1986;11:149-53.
- Domenicucci M, Mancarella C, Santoro G, Dugoni DE, Ramieri A, Arezzo MF, et al. Spinal epidural hematomas: Personal experience and literature review of more than 1000 cases. *J Neurosurg Spine* 2017;27:198-208.
- Dorsay TA, Helms CA. MR imaging of epidural hematoma in the lumbar spine. *Skeletal Radiol* 2002;31:677-85.
- Figuerola J, DeVine JG. Spontaneous spinal epidural hematoma: Literature review. *J Spine Surg* 2017;3:58-63.
- Giri PJ, Sharma MS, Jaiswal AK, Behari S, Jain VK. Extruded lumbar disc associated with epidural hematoma. Case report. *J Neurosurg* 2006;104 Suppl 4:282-4.
- Jain N, Crouser N, Yu E. Lumbar intervertebral disc herniation masquerading as an epidural hematoma: A case report and review of the literature. *JBJS Case Connect* 2018;8:e59.
- Kil JS, Park JT. Posterior epidural herniation of a lumbar disk fragment at L2-3 that mimicked an epidural hematoma. *Korean J Spine* 2017;14:115-7.
- Kim JH, Kim SH, Lee SK, Moon BJ, Lee JK. Traumatic lumbar disc herniation mimicking epidural hematoma: A case report and literature review. *Medicine (Baltimore)* 2019;98:e15438.
- Kreppel D, Antoniadis G, Seeling W. Spinal hematoma: A literature survey with meta-analysis of 613 patients. *Neurosurg Rev* 2003;26:1-49.
- Sander AL, Laurer H, Lehnert T, El Saman A, Eichler K, Vogl TJ, et al. A clinically useful classification of traumatic intervertebral disk lesions. *AJR Am J Roentgenol* 2013;200:618-23.
- Sklar EM, Post JM, Falcone S. MRI of acute spinal epidural

- hematomas. *J Comput Assist Tomogr* 1999;23:238-43.
13. Song KJ, Lee KB, Kim DY, Lee SY. A traumatic disc herniation mimicking an epidural hematoma in a young adult-a case report. *Neurosurg Q* 2012;22:81-3.
 14. Watanabe N, Ogura T, Kimori K, Hase H, Hirasawa Y. Epidural hematoma of the lumbar spine, simulating extruded lumbar disk herniation: Clinical, discographic, and enhanced magnetic

resonance imaging features. A case report. *Spine (Phila Pa 1976)* 1997;22:105-9.

How to cite this article: Basile L, Brunasso L, Gerardi RM, Maugeri R, Iacopino DG, Guli C, *et al.* Traumatic lumbar disc extrusion mimicking spinal epidural hematoma: Case report and literature review. *Surg Neurol Int* 2020;11:348.