

Posttraumatic Acute Spinal Epidural Hematoma of the Dorsolumbar Region

Amit Agrawal¹ Uma Maheshwara Reddy V.² Kuraparthi Brinda³ Luis R. Moscote-Salazar⁴
Keerthana Dhanireddy²

¹Department of Neurosurgery, Narayana Medical College Hospital, Chinthareddypalem, Nellore, Andhra Pradesh, India

²Department of Radiology, Narayana Medical College Hospital, Chinthareddypalem, Nellore, Andhra Pradesh, India

³Department of Anesthesia, Narayana Medical College Hospital, Chinthareddypalem, Nellore, Andhra Pradesh, India

⁴Faculty of Medicine, Neurosurgeon-Critical Care, Center for Biomedical Research (CIB), University of Cartagena, Cartagena de Indias, Bolivar, Colombia

Address for correspondence Amit Agrawal, MCh, Department of Neurosurgery, Narayana Medical College Hospital, Chinthareddypalem, Nellore 524003, Andhra Pradesh, India
(e-mail: dramitagrawal@gmail.com).

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Abstract

Keywords

- ▶ spinal injury
- ▶ spinal extradural hematoma
- ▶ epidural fat
- ▶ vertebral fracture
- ▶ magnetic resonance imaging

In spite of the relative common occurrence of spinal injuries, spinal epidural hematomas (SEHs) are rare lesions. Depending on the onset, site, size, and presence of neurological deficits, they can be treated conservatively or surgically. In the presented article, we report an uncommon case of posttraumatic dorsolumbar SEH and discuss the characteristic magnetic resonance imaging (MRI) imaging findings of epidural fat in the cases of traumatic spinal hematomas.

Introduction

Spinal epidural hematoma (SEH) is an uncommon clinical condition, which is characterized by the collection of blood in the spinal epidural space, leading to spinal cord/roots compression and its potential neurological deficits.^{1–4} We report an uncommon case of posttraumatic dorsolumbar SEH treated surgically with outcome, and discuss the characteristic imaging findings.

Case Report

A 43-year-old male patient was brought to the emergency room approximately 12 hours after an alleged fall from a coconut tree. The patient was complaining of backache, weakness of both lower limbs since the incident, and urinary retention. There was no history of loss of consciousness, vomiting, seizures, or ENT (ear, nose, and tongue) bleed. On examination, he was conscious, alert (Glasgow coma scale [GCS]: E4V5M6), pupils were bilateral and reacting

to light, and the cranial nerves were normal. The patient also had decreased tone in both lower limbs and paraparesis of grade 2 of 5, with decreased deep tendon reflexes in lower limbs and absent planters. The patient had urinary retention for which indwelling catheter was placed. There was decreased sensation over the lower limbs including perianal region sensations. Motor and sensory examination in upper limbs was normal. Local spine examination revealed tenderness over dorsolumbar spine region. All the laboratory investigations were within normal limits. X-ray of dorsolumbar spine showed fracture of D12 vertebral body. Magnetic resonance imaging (MRI) of spine and sagittal T2-weighted MRI showed fracture of D12 vertebral body with posterior epidural hematoma (EDH), appearing heterogeneously hyperintense to the cord with few tiny hyperintense areas within and, causing mass effect on the cord with loss of epidural fat. There was mild cord edema at the same level (▶ Fig. 1). In view of incomplete injury and bladder involvement, the patient underwent D11 and D12 laminectomy, evacuation of extradural hematoma,

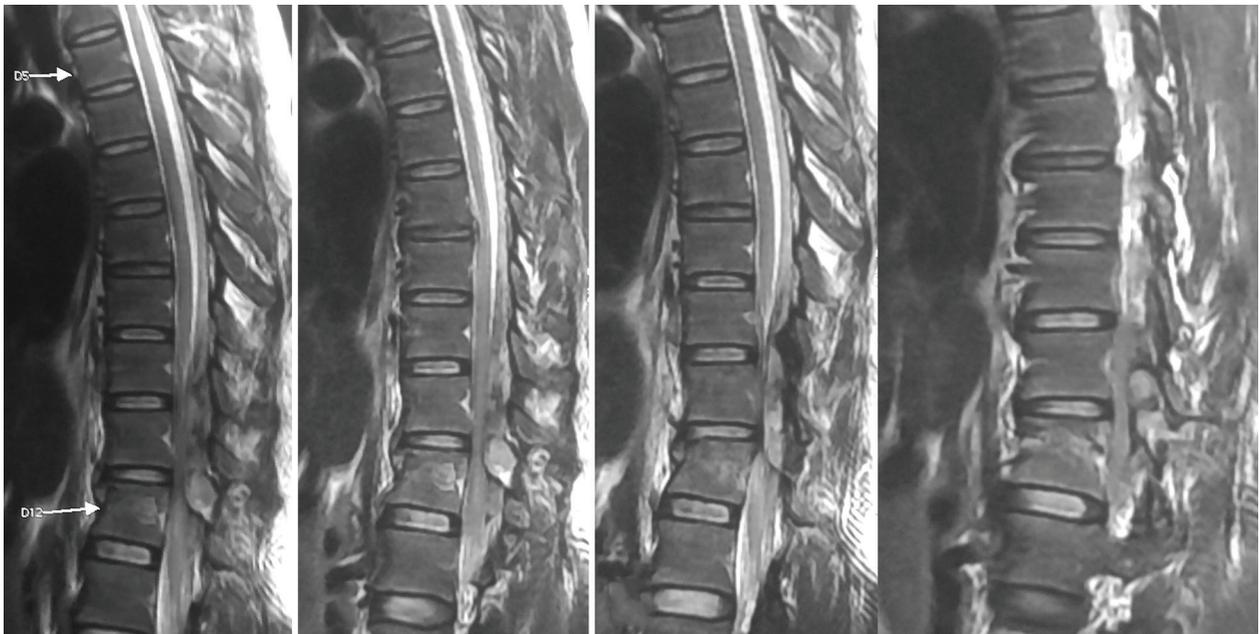


Fig. 1 Sagittal T2-weighted MRI images of dorsal spine shows fracture of D12 vertebral body with posterior epidural hematoma appearing heterogeneously hyperintense to the cord, with few tiny hyperintense areas within, causing mass effect on the cord and loss of epidural fat. Mild cord edema also can be seen at this level. MRI, magnetic resonance imaging.

and D11–L1 spinal fixation. In addition to EDH, there was fracture of D12 spinous process and laminae. Following surgery, the power in lower limbs improved to grade 4+ of 5 on day 2 with regain in bladder control. Standard physiotherapy protocol was taught to the patient and at 6-month follow-up, the patient was walking without support.

Discussion

Despite of the fact that there is a large occurrence of spinal injuries, the incidence of SEHs is very low,^{1,3-7} probably due to high-energy traumatic events or patients who have predisposing factors (ankylosing spondylitis, rheumatoid arthritis, and psoriatic spondylitis).³ SEH can be classified as idiopathic, spontaneous or posttraumatic, traumatic lesions (with or without vertebral fractures),^{3,8-10} or a complication after mini-invasive spine approach.^{11,12} It has been postulated that trauma can lead to rupture of thin-walled epidural veins of Batson's plexus with appearance of EDH.^{7,13,14} Lesions occurring in the cervical lesions has more potential to cause early neurological deterioration (the size of epidural space is less) than lesions occurring in the lumbar region.^{7,15,16} MRI is the investigation of choice, as this will show the presence of the lesion, size and extent of the lesion, presence of vertebral fractures, and extent of compression of neural structures,^{5,7,17-19} and will also help in differentiating from other lesions involving the spinal cord.¹⁹ Characteristically, on MRI, the spinal epidural fat is lost,¹⁹ which is in contrast to acute spinal subdural, where there is preservation of epidural fat.^{17,20,21} The management of SEH depends on the onset (acute vs. chronic), size, extent, and presence of neurological deficits.³ Surgery is recommended in large-size lesions with

neurological deficits to achieve good functional outcome.^{1,3,22} In selected cases, a conservative management has also shown to be effective with good outcome.^{7,18}

Conclusion

SEHs are rare lesions and their diagnosis requires a high index of clinical suspicion. The characteristic MRI findings of epidural fat show loss of epidural fat. The management of SEH depends on the onset, site, size, and presence of neurological deficits. Early surgical intervention for larger lesions results in good recovery of neurological functions.

Conflict of Interest

None declared.

References

- 1 Ricart PA, Verma R, Fineberg SJ, et al. Post-traumatic cervical spine epidural hematoma: Incidence and risk factors. *Injury* 2017;48(11):2529–2533
- 2 Al-Mutair A, Bednar DA. Spinal epidural hematoma. *J Am Acad Orthop Surg* 2010;18(8):494–502
- 3 Tamburrelli FC, Meluzio MC, Masci G, Perna A, Burrofato A, Proietti L. Etiopathogenesis of traumatic spinal epidural hematoma. *Neurospine* 2018;15(1):101–107
- 4 Foo D, Rossier AB. Post-traumatic spinal epidural hematoma. *Neurosurgery* 1982;11(1, Pt 1):25–32
- 5 Deok Heon L, Tak-Hyuk O, Jong-Chul L, Kyoung Hoon L. Delayed posttraumatic spinal epidural hematoma: importance of early surgical treatment for neurologic deficits. *J Korean Soc Traumatol* 2016;29:176–179
- 6 Kreppel D, Antoniadis G, Seeling W. Spinal hematoma: a literature survey with meta-analysis of 613 patients. *Neurosurg Rev* 2003;26(1):1–49

- 7 Pan G, Kulkarni M, MacDougall DJ, Miner ME. Traumatic epidural hematoma of the cervical spine: diagnosis with magnetic resonance imaging. Case report. *J Neurosurg* 1988;68(5):798–801
- 8 Caron T, Bransford R, Nguyen Q, Agel J, Chapman J, Bellabarba C. Spine fractures in patients with ankylosing spinal disorders. *Spine* 2010;35(11):E458–E464
- 9 Heppner PA, Monteith SJ, Law AJ. Spontaneous spinal hematomas and low-molecular-weight heparin. Report of four cases and review of the literature. *J Neurosurg Spine* 2004;1(2):232–236
- 10 Hsieh CT, Chiang YH, Tang CT, Sun JM, Ju DT. Delayed traumatic thoracic spinal epidural hematoma: a case report and literature review. *Am J Emerg Med* 2007;25(1):69–71
- 11 Awad JN, Kebaish KM, Donigan J, Cohen DB, Kostuik JP. Analysis of the risk factors for the development of post-operative spinal epidural haematoma. *J Bone Joint Surg Br* 2005;87(9):1248–1252
- 12 Birkenmaier C, Seitz S, Wegener B, et al. Acute paraplegia after vertebroplasty caused by epidural hemorrhage. A case report. *J Bone Joint Surg Am* 2007;89(8):1827–1831
- 13 Di Gaeta A, Capobianco E. Chronic extradural spinal hematoma after previous trauma. *Eur J Radiol Open* 2015;2:55–57
- 14 Scott BB, Quisling RG, Miller CA, Kindt GW. Spinal epidural hematoma. *JAMA* 1976;235(5):513–515
- 15 Levitan LH, Wiens CW. Chronic lumbar extradural hematoma: CT findings. *Radiology* 1983;148(3):707–708
- 16 Zilkha A, Irwin GA, Fagelman D. Computed tomography of spinal epidural hematoma. *AJNR Am J Neuroradiol* 1983;4(5):1073–1076
- 17 Kumar VAK, Sandeep Y, Reddy VU, Samudrala VD, Agrawal A. Posttraumatic acute spinal subdural hematoma of the spine. *IJNT* 2017;14:53–55
- 18 Yi K-C, Paeng SH, Jung YT, et al. Spontaneous resolution of a traumatic lumbar epidural hematoma with transient paraparesis. *Nerve* 2016;2:71–73
- 19 Kulkarni MV, McArdle CB, Kopanicky D, et al. Acute spinal cord injury: MR imaging at 1.5 T. *Radiology* 1987;164(3):837–843
- 20 Boukobza M, Haddar D, Boissonet M, Merland JJ. Spinal subdural haematoma: a study of three cases. *Clin Radiol* 2001;56(6):475–480
- 21 Post MJ, Becerra JL, Madsen PW, et al. Acute spinal subdural hematoma: MR and CT findings with pathologic correlates. *AJNR Am J Neuroradiol* 1994;15(10):1895–1905
- 22 Panciani PP, Cornali C, Agnoletti A, Esposito G, Ronchetti G, Fontanella M. Recovery after delayed surgery in a case of spinal subdural hematoma. *Case Rep Neurol Med* 2013;2013:310854