

## Spontaneous Spinal Epidural Hematoma Presenting as Acute Paraplegia

Krishnan Balagopal<sup>1\*</sup>, G. Sreekumar<sup>2</sup>, Sanju M. Libu<sup>2</sup>  
and Amalu Joy<sup>2</sup>

<sup>1</sup>Department of Neurology, MOSC Medical College, Kolenchery, Kochi, India.

<sup>2</sup>Department of Neurosurgery, MOSC Medical College, Kolenchery, Kochi, India.

### Authors' contributions

*This work was carried out in collaboration among all authors. Author KB designed the study, performed the analysis, wrote the protocol and wrote the first draft of the manuscript. Author GS managed the analyses of the study and data collection. Authors SML and AJ managed the literature searches and data collection. All authors read and approved the final manuscript.*

### Article Information

#### Editor(s):

(1) Prof. Ayhan Goktepe, Selcuk Universitesi, Turkey.

#### Reviewers:

(1) Juan Esteban Muñoz Montoya, Universidad Militar Nueva Granada, Colombia, Universidad Cardinal Herrera, Spain.

(2) Sachin Chhabra Chhabra, Neurospine and Critical Care Centre, India.

Complete Peer review History: <http://www.sdiarticle4.com/review-history/69765>

Case Report

Received 02 April 2021  
Accepted 12 June 2021  
Published 15 June 2021

### ABSTRACT

**Background:** Spontaneous spinal epidural hematoma is a rare condition which can have disabling neurological complications. Prompt timely surgical management may promote recovery even in severe cases. Timely recognition and diagnosis is essential for proper treatment.

**Objective:** To describe a case of spontaneous spinal epidural hematoma with acute presentation which was treated surgically with good outcomes.

**Presentation of Case:** We report a 66-year-old man with a four hour history of sudden severe upper back pain, followed by complete weakness and numbness over the bilateral lower limbs. A spinal magnetic resonance imaging scan was performed and revealed a posterior epidural hematoma of the cervicothoracic spine. He underwent an emergency decompressive laminectomy of the spine and hematoma evacuation. Just after surgery, his lower extremity movements

improved. After 4 weeks, significant improvement in weakness and ambulation with assistance was resumed. The diagnosis of spontaneous spinal epidural hematoma must be considered in patients presenting with acute onset of back pain along with symptoms of compression of the spinal cord. Early recognition of the problem, proper investigations and diagnosis and prompt surgical treatment may result in significant improvement even in severe cases.

**Keywords:** Spinal epidural hematoma; paraplegia; decompression.

## ABBREVIATIONS

*SSEH* : Spontaneous Spinal Epidural Hematoma

*MRI* : Magnetic Resonance Imaging

*AVM* : Arteriovenous Malformation

*ASIA* : American Spinal Injury Association

## 1. INTRODUCTION

Spontaneous spinal epidural hematoma (SSEH) is a rare cause of back pain in the emergency department but one that carries high morbidity [1]. It commonly presents with acute onset of severe, often radiating back pain followed by signs and symptoms of nerve root and spinal cord compression, which develops later [2]. The true etiology of SSEH remains unknown, but associations with some predisposing conditions, such as coagulopathies, blood dyscrasias and arteriovenous malformation, have been reported [3]. Timely surgical removal of the epidural clot remains the standard management [4]. This report presents a patient with no prior comorbidities who was admitted to the emergency department with back pain and symptoms of spinal cord compression caused by SSEH, in whom prompt surgical treatment prevented severe neurological sequelae.

## 2. CASE HISTORY

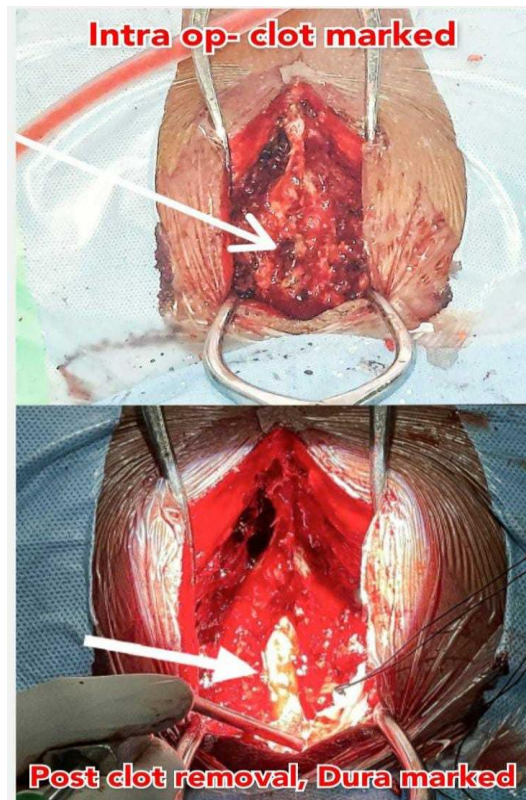
This 66 year old patient presented to the emergency department with a four hour history of sudden acute severe upper back pain at the interscapular level. This was followed by sudden onset of complete weakness of both lower limbs and inability to pass urine. There was no history of trauma, drug abuse or any undue physical exertion. He was a known case of Type 2 Diabetes Mellitus on treatment. On presentation in the emergency, he was conscious and alert, with no respiratory distress and normal vital signs.

Neurological examination revealed complete paraplegia with Grade 0/5 power in both lower limbs with absent sensations below nipple, flaccidity in lower limbs, bilateral inelicitable plantar responses and urinary retention requiring catheterization-corresponding to ASIA impairment scale Grade A (Severe Injury). Power in the upper limbs, cranial nerves and peripheral pulsations were all within normal limits. He was seen in the emergency by the Neurology team and a diagnosis of an acute complete transverse myelopathy was made. He was taken up urgently for an MRI Scan of the cervicothoracic spine which showed a posterior epidural lentiform mass extending from C7 to D1 level, causing spinal cord compression. The mass showed hyperintensity on T2 weighted imaging and hypointensity to cord on T1 images (Fig. 1). Based on the clinical presentation and imaging findings, an epidural hematoma of the spine was considered most likely.

Bleeding and coagulation parameters were within normal limits. He was admitted to the intensive care unit and given a single pulse dose of intravenous methylprednisolone. Emergency neurosurgical opinion was taken and he underwent an emergency decompressive laminectomy and hematoma evacuation under general anaesthesia cover within six hours of presentation (Fig. 2). Post operatively, he was managed with analgesics, antiedema measures and antibiotics. He was started on exercises and physiotherapy. He had improvement in motor power to Grade 2/5 and was on catheter at discharge. He subsequently came for a follow up after 4 weeks. At this point of time, he had improvement in power to Grade 4/5 and was able to walk without support. He remains on clean intermittent catheterization and is being continued on physiotherapy. It is planned to do a spinal Digital Subtraction Angiogram at next follow up to rule out any spinal Arteriovenous malformation (AVM).



**Fig. 1. MRI Spine T2 Axial/Sagittal images showing posterior epidural mass causing cord compression at C7-D1 levels**



**Fig. 2. Intra operative and postoperative images of clot evacuation**

### 3. DISCUSSION

Spinal epidural hematomas (SEHs) are of two main types-traumatic and spontaneous. Traumatic SEHs are considered to occur secondary to spinal surgeries, lumbar puncture, vertebral fractures, and any spinal intervention [5]. Acute spontaneous SSEHs do not present with any underlying condition in about fifty percent of all cases. Some conditions known to be associated include anticoagulants, AVMs of the spinal cord and cord tumors with bleed. Since there was no prior trauma and no abnormality seen on blood coagulation profile, our case was diagnosed as a spontaneous epidural hematoma. SSEHs are mostly seen in patients above the age of 40 years but are known to occur in all age groups. SSEH differs in the location affected depending on the age group involved. Literature describes the involvement of the lumbar regions in older patients. Younger patients tend to have more involvement of the cervical and thoracic regions.

The exact cause of SSEH remains unknown though there are various postulates [6]. One of the most accepted theories states that any sudden rise in the pressure of the posterior epidural plexus results in rupture of the spinal venous system [7]. Low pressures in the venous plexus causing damage to the spinal epidural arteries has also been considered as a causative mechanism [8]. SSEH classically presents with a sudden onset of pain in the neck and back followed by weakness of the extremities. This leads over a time period to the patient developing motor weakness, sensory loss of varying degrees and bowel and bladder involvement. The diagnosis is difficult to make and commonly missed prior to the onset of neurological deficit due to the varying presentation [9]. A wide range of differentials should be considered in these patients. These should include pulmonary emboli, spontaneous pneumothorax, and acute myocardial infarction in the absence of neurological deficit due to the pain in the back and chest [10]. In the presence of neurological deficits, the differentials include acute transverse myelitis, Guillain Barre Syndrome, and anterior spinal artery syndrome with cord ischaemia [11]. MRI of the spine is the gold standard used in the diagnosis of SSEH. SSEH yields an isointense signal change on T1-weighted images within the first 24 h after bleeding along with a hyperintense signal change on T2-weighted images after 24 hours. Urgent surgical decompression of the spinal cord in the SSEH patients with

neurological deficit is the treatment of choice for recovery of function [12]. The preoperative neurological status in the form of grade of cord injury and the interval between the onset of symptoms and surgical management are key factors determining the longterm prognosis [13]. The smaller the time interval between onset of symptoms and surgical intervention, the better the neurological response to be received through the treatment and longterm outcome. Immediate decompression of the spinal cord is very important because prolonged compression of the spinal cord may lead to irreversible injury to the motor and sensory fibers. Surgical treatment includes total laminectomy and the complete evacuation of the hematoma.

### 4. CONCLUSION

Spontaneous Spinal Epidural Hematoma (SSEH) is a rare cause of acute paraplegia which must be kept in mind when a patient presents with neck or back pain followed by lower limb weakness. Prompt diagnosis and early surgical decompression can help to prevent irreversible and severe neurological deficits.

### DISCLAIMER

The products used for this research are commonly and predominantly use products in our area of research and country. There is absolutely no conflict of interest between the authors and producers of the products because we do not intend to use these products as an avenue for any litigation but for the advancement of knowledge. Also, the research was not funded by the producing company rather it was funded by personal efforts of the authors.

### CONSENT

All authors declare that 'written informed consent was obtained from the patient (or other approved parties) for publication of this case report and accompanying images'.

### ETHICAL APPROVAL

All necessary institutional ethical approval taken.

### COMPETING INTERESTS

Authors have declared that no competing interests exist.

## REFERENCES

1. Taniguchi LU, Pahl FH, Lúcio JE, Brock RS, Gomes MQ, Adoni T, et al. Complete motor Recovery After Acute Paraparesis Caused by Spontaneous Spinal Epidural Hematoma: Case Report. BMC Emerg Med. 2011; 11:10.
2. Lannum S, Stratton J. Spontaneous Epidural Hematoma of The Thoracic Spine in a 17-year-old Adolescent Boy: a Case Report. Am J Emerg Med. 2009;27(5): 628.
3. Dinsmore AJ, Leonard RB, Manthey D. Spontaneous Spinal Epidural Hematoma: a Case Report. J Emerg Med. 2005;28(4): 423-6.
4. Groen RJ, van Alphen HA. Operative treatment of spontaneous spinal epidural hematomas: a study of the factors determining postoperative outcome. Neurosurgery. 1996;39(3):494-508.
5. Kreppel D, Antoniadis G, Seeling W. Spinal hematoma: a literature survey with meta-analysis of 613 patients. Neurosurg Rev. 2003;26(1):1-49.
6. Alexiadou-Rudolf C, Ernestus RI, Nanassis K, Lanfermann H, Klug N. Acute nontraumatic spinal epidural hematomas: an important differential diagnosis in spinal emergencies. Spine. 1998;23:1810-1813.
7. Figueroa J, DeVine JG. Spontaneous Spinal Epidural Hematoma: Literature Review. J Spine Surg. 2017;3(1):58-63.
8. Raasck K, Habis AA, Aoude A, Simões L, Barros F, Reindl R, et al. Spontaneous spinal epidural hematoma management: a case series and literature review. Spinal Cord Ser Cases. 2017;3:16043.
9. Fiani B, Jarrah R, Fiani NJ, Runnels J. Spontaneous cervical epidural hematoma: insight into this occurrence with case examples. Surg Neurol Int. 2021;12:79.
10. Yang SM, Kang SH, Kim KT, Park SW, Lee WS. Spontaneous spinal epidural hematomas associated with acute myocardial infarction treatment. Korean Circ J. 2011;41(12):759-762.
11. Park J, Lee JB, Park JY, Lim DJ, Kim SD, Chung YK. Spinal cord infarction after decompressive laminectomy for spontaneous spinal epidural hematoma. Neurol Med Chir (Tokyo). 2007;47:325-327.
12. Aycan A, Ozdemir S, Arslan H, Gonullu E, Bozkına C. Idiopathic thoracic spontaneous spinal epidural hematoma. Case Rep Surg. 2016;5430708.
13. Lawton MT, Porter RW, Heiserman JE, Jacobowitz R, Sonntag VK, Dickman CA. Surgical management of spinal epidural hematoma: relationship between surgical timing and neurological outcome. J Neurosurg. 1995;83(1):1-7.

© 2021 Balagopal et al.; This is an Open Access article distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0>), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

Peer-review history:

The peer review history for this paper can be accessed here:  
<http://www.sdiarticle4.com/review-history/69765>