

# Brown Sequard Syndrome Secondary to a Spontaneous Cervical Epidural Hematoma - A Rare Entity

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## What to Learn from this Article?

*Etiology, Diagnosis and Management of Spontaneous Cervical Hematoma  
Surgical management for evacuation of cervical hematoma*

### Abstract

**Introduction:** Brown Sequard syndrome resulting from compression due to an epidural hematoma is a relatively rare occurrence, more so with a spontaneous history. We report one such case.

**Case Report:** We present a 65yr old female presenting with hemiplegia with contralateral anesthesia. Magnetic resonance imaging showed a hematoma in the epidural space in the C3-C4 region. She underwent an open door laminoplasty for evacuation of the hematoma. Following surgery the patient responded rapidly and currently at 18 months follow up she is neurologically grade 5/5 with normal sensations.

**Conclusions:** In the emergency room when a patient is clinically diagnosed as a case of Brown Sequard syndrome it is important to ask for an MRI scan of the cervical spine. Hematoma in the cervical epidural space should be considered in the differential diagnosis of Brown Sequard syndrome especially in the elderly with history of doubtful trivial trauma.

**Keywords:** Cervical epidural hematoma, Brown Sequard syndrome, Magnetic Resonance Imaging.

### Introduction

Brown Sequard syndrome is an incomplete spinal cord lesion characterized by a clinical presentation reflecting hemi-section of the spinal cord. This is referred to as ipsilateral hemiplegia and contralateral pain and temperature sensation deficits (anaesthesia). The most common cause is penetrating trauma such as a gunshot wound or stab wound to the spinal cord, however spinal tumours and blunt trauma to the spine have also been implicated as potential causes. Hematoma is also a cause of Brown Sequard syndrome but is very rare and usually occurs with predisposing risk factors for bleeding (anticoagulant therapy, hypertension). Brown Sequard syndrome as a result of cervical epidural hematoma is a rare entity with only a handful of cases reported in literature

[1]. We describe a case of Brown Sequard syndrome in a 65 year old female without any underlying risk factors, presenting with sudden onset hemiparesis rapidly progressing to hemiplegia (within a span of days) due to a cervical epidural hematoma following a doubtful history of trivial trauma.

### Case Report

A previously healthy 65 year old female presented to us with the complaint of right side hemiplegia without any significant history of trauma. On subsequent inquiry she gave a history of brisk involuntary hyperextension of the neck following which she developed sudden onset hemiparesis, progressed to hemiplegia within a span of five days. The patient was neither diabetic, hypertensive nor on antiplatelet/anticoagulant therapy. She did not have a

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### Author's Photo Gallery



Dr Nikunj Agrawal



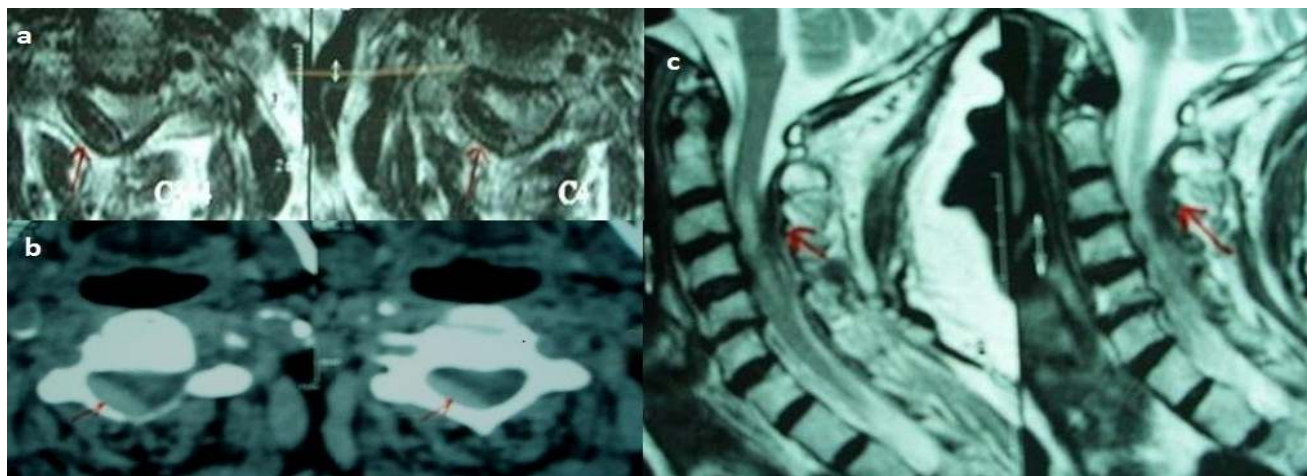
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**A.T2** Weighted transverse section of the cervical cord showing an area of heterogeneous hyper intensity compressing the cord.  
**B.T1** Weighted transverse section of the spine showing an isointense lesion compressing the cord.  
**C.T2** Weighted sagittal cut of the cervical spinal cord showing heterogeneous hyper intense signal of the hematoma.

history of any congenital or acquired disorder of coagulation. On elaborate neurological survey it was found that motor power of the patient's right side upper and lower limb was of grade 0/5 with anesthesia of left side below C3. The patient had spasticity with hyperreflexia and extensor plantar response on motor affected side. Her bladder and bowel functions were normal. She was evaluated with a cervicodorsal MRI scan, which showed a hyper intense space occupying lesion suggesting an epidural hematoma at the C3-C4 level (FIG.1). The lesion was compressing the thecal sac as well as spinal cord. The patient was taken up for emergency surgery. With the patient in prone position under general anaesthesia, a posterior midline incision was taken exposing the tips of the spinous processes from C3 to C5 levels. Two bony gutters were drilled bilaterally at the border of the exposed laminae by means of an air drill. In our case, the left side border of the laminae was excised from its cranial to caudal end with a kerison rongeur and the spinous processes and the laminae were pushed laterally as if to open a door, thereby exposing the spinal canal (Hirabayashi's open door laminoplasty) [2]. Blood clot was found within the epidural space, which was evacuated. Histopathological examination of the evacuated material confirmed hematoma.

Postoperatively the patient was immobilized with a hard cervical collar and physiotherapy (passive mobilization) was started. Four months following the surgery the patient regained her motor strength to grade 3/5 with partial return of sensory functions. At twelve months follow up motor power of the affected side improved to grade 5/5 with regaining of normal sensory functions on opposite side.

### Discussion

Spontaneous cervical epidural hematoma was first described in 1869 by Jackson [1]. About 40% of the cases reported in the literature till date do not have any demonstrable etiology and are therefore referred to as idiopathic spontaneous cervical epidural hematoma [3]. These need to be differentiated from other well known causes such as neoplasm and systemic diseases [4], anticoagulant therapy [3], hypertension or vascular malformations [5] and pregnancy [6] for planning of the management and to predict prognosis.

There is controversy regarding the source of the hematoma; is it arterial or venous? The proponents of the venous origin theory maintain that the sudden increase in intra-thoracic and intra-abdominal pressure leads to the rupture of the thin walled epidural veins. Thus during activities like coughing, sneezing, straining during defecation and micturition, vomiting and coitus these thin walled epidural veins may rupture and lead to the generation of the hematoma [7]. However several authors have pointed out that since the epidural venous pressure is less than the intrathecal pressure, thus these ruptured veins are an unlikely source to produce a hematoma large enough to cause compression of the thecal sac and develop Brown Sequard syndrome [3]. After study of the arterial structures of the cervical epidural region it has been hypothesized that extreme movements at the cervicodorsal junction could result in tearing of the arteries [3]. The high arterial pressure can lead to development of hematoma large enough to cause compression of the dural sac leading to the clinical syndrome of cord compression. The most common presentation of spontaneous cervical epidural hematoma

is acute onset of neck pain, which is usually radiating in nature and the localization depends on the involvement of specific nerve roots. The second most common symptom is weakness of the limbs below the level of compression. The weakness gradually increases over days but complete loss of motor power has not been reported and this deficit rarely recovers spontaneously [8].

MRI is the diagnostic tool of choice in spontaneous cervical epidural hematoma [9]. On T2 weighted images the hematoma appears as an area of heterogeneous hyper-intensity of the cord with focal hypo-intense areas. On T1 weighted images the lesion is usually iso-intense in the acute phase; however chronic hematomas may be hyper-intense. CT or CT myelography can be done where MRI is not available. Spinal angiography may be useful in defining vascular pathology.

The treatment of choice in spontaneous cervical epidural hematoma is emergency surgical decompression although a few cases have been reported in literature to have recovered without any surgical intervention [10]. The procedure of choice is a laminectomy, although a hemi-laminectomy or laminoplasty could be performed depending on the extent and localization of the hematoma [11].

### Conclusion

Spontaneous cervical epidural hematoma leading to a Brown Sequard syndrome is a rare entity in clinical practice and it has a fatal progressive course in cases where the diagnosis is delayed. Spontaneous cervical epidural hematoma may present as hemiparesis prompting the emergency room physician to make an erroneous diagnosis of cerebrovascular accident, leading to delay in the diagnosis. Prompt diagnosis of the condition and urgent decompression is vital to prevent irreversible damage of the cord. A thorough clinical

### Clinical Message

In cases presenting as hemiparesis, sensory examination of opposite side should be done to rule out Brown-Sequard Syndrome. An MRI can delineate the cause and surgical decompression is warranted in cases of Spontaneous epidural hematoma that causes neurodeficit. Good clinical results can be expected with early evacuation of hematoma

examination is a must followed by a MRI scan of the cervical spine to exclude this rare entity. Although there have been rare reports of spontaneous recovery, surgical decompression is the preferred modality of treatment.

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