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# Cervical fracture from chronic steroid usage presenting as a stroke: A case report

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ABSTRACT

*INTRODUCTION:* Misdiagnosis of Brown-Séquard-like presentations can delay treatment; potentially endangering the positive outcomes a patient might otherwise have had. Stroke mimics can be perceived as signaling the end of urgent investigation and care once stroke is ruled out; however, stroke mimics themselves can require prompt care. Herein, we discuss an extremely rare case where stroke was ruled out, resulting in a lapse in care that lead to an exacerbated hemiparesis over the following week.
*PRESENTATION OF CASE:* We present a patient with an occult cervical spine fracture with extension of the neck, caused by reduced bone density from a chronic steroid regimen. Nine days after the initial onset of her neurological symptoms, the patient presented to the ED with the complaint of left sided weakness and right-sided sensory loss. She was determined to have a left- sided Brown Séquard syndrome, which resolved following anterior cervical discectomy and fusion at C4-C6 and a laminectomy from C4-C6.
*DISCUSSION:* This case indicated that patients with dangerously low bone density should be weaned off chronic steroid therapy to prevent the onset of osteoporotic symptoms early in adulthood. Furthermore, this case emphasizes the importance of continued investigation of symptoms if a stroke is ruled out and the need for more diligent monitoring of bone density of chronic steroid users.
*CONCLUSION:* Stroke mimics can require the same urgency in care and diagnosis as strokes themselves.


## 1. Introduction

Trauma, spinal cord lesions and stroke are the most common causes of hemiparesis [1].These pathologies, especially in an emergent setting of a patient presenting with symptoms of a stroke, can be overlooked. The disparate causes and propensity for misdiagnosis of Brown-Séquard-like presentations can delay treatment and potentially endanger positive outcomes [1,2]. In this case, a cervical spine occult fracture caused the patient's hemiparesis, which was diagnosed nine days after symptom onset. Herein, we present an extremely rare case of cervical extension fractures without trauma that mimicked stroke symptoms and hence delayed treatment.

## 2. Presentation of case

A 41-year-old female with a history of chronic immunosuppressant and steroid use for juvenile rheumatoid arthritis experienced sudden onset of pain while showering. The pain began along her left shoulder and was followed by progression of numbness and tingling down the arm then weakness of her left shoulder and arm. The emergency medical service was activated but the patient declined to be transported to the hospital, as she was reportedly neurologically intact and stable when EMS arrived. Her symptoms, however, returned and worsened throughout the evening and she presented to the emergency department for evaluation. During the course of her work-up, MRI of her brain and spine were performed and were negative, including DWI and STIR imaging. Two days later, the patient was seen by a neurologist and was diagnosed with a possible brachial plexopathy. The patient's symptoms improved over the next four days. On the sixth day after the onset of her symptoms, the patient's left extremity weakness dramatically worsened and was accompanied by pain. The patient did not immediately return to the ED for evaluation and presented again 3 days later.

*Abbreviations:* ED, emergency department; EMS, emergency medical services; CT, computed tomography; MRT, magnetic resonance therapy; SSEP, somatosensory evoked potentials; DWI, diffusion-weighted imaging; STIR, short tau inversion recovery.

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**Fig 1.** Sagittal MRI T2 sequence of the cervical spine demonstrating an expanded spinal cord with myelomalacia at the level of C4/5.


**Fig. 2.** Sagittal CT scan of the cervical spine showing an ankylosed spine.

Nine days after the initial onset of her neurological symptoms, the patient presented to the ED with the complaint of left sided weakness and right sided sensory loss. On exam she was discovered to have a left sided Brown Séquard syndrome involving left hemiparesis and loss of left sided proprioception concurrently with had right-sided loss of pain and temperature sensation. Imaging was reviewed and an MRI of the cervical spine demonstrated evidence of a contused cord on the left side with cord edema and significant ankylosis at C4-5 and C5-6 (Fig. 1). CT scan of the cervical spine demonstrated an ankylosed spine (Fig. 2). Neither the CT, performed with two millimeter slices as per our trauma protocol, nor the MRI image showed any fracture, though significant enhancing edema was seen in the facet joints at C4-6, significantly different from the initial MRI. The patient was started on high-dose steroids in preparation for urgent surgical intervention.

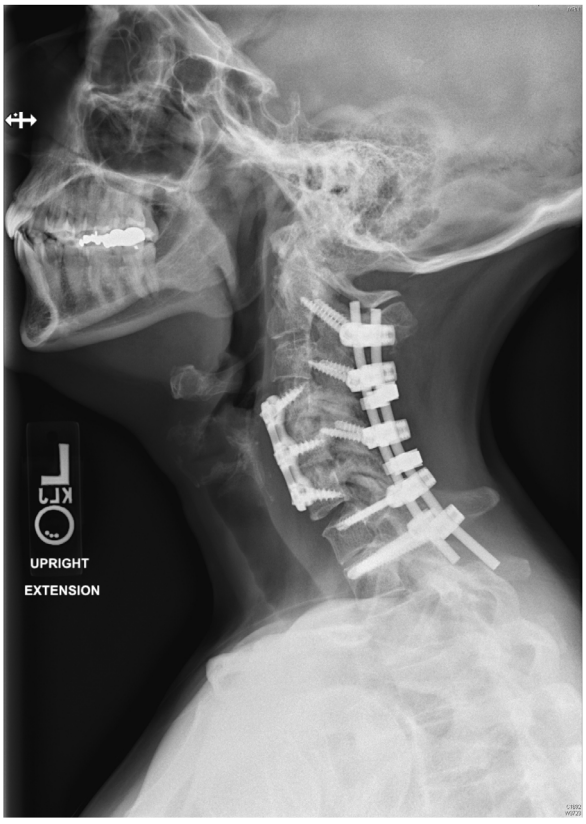


**Fig. 3.** Post-operative cervical spine X-ray demonstrating an anterior c4-6 fusion and a posterior C2-T1 fusion with well-placed instrumentation.

The patient underwent a two-staged procedure. First, an anterior cervical discectomy and fusion from C4 to C6 were performed. Motor signaling from somatosensory evoked potential (SSEP) monitoring remained stable during the surgery. In the immediate post-operative period her exam remained stable. Two days later, the patient underwent a laminectomy from C3-6 with posterior cervical fusion from C2-T1 (Fig. 3). During the posterior fusion, a clear bilateral fracture was encountered at C4-6 through the facet joints that rendered the spine grossly unstable intraoperatively. With instrumentation, closed reduction, and fusion, stability had been achieved.

The patient tolerated the procedures without further decline in examination or other complications and post-operatively, her deficits gradually improved. The patient was discharged on post-operative day four from the last procedure and her strength in her upper extremities was asymmetric; her right side remained stronger than her left but on her left, she was regaining strength of her deltoid, triceps brachii and biceps brachii muscles. Her strength was also improving in her lower extremities and at the time of discharge, she was able to walk ten feet at a time with assistance.

At her nine week follow-up, the patient's symptoms were significantly improved. Although her left-sided hemiparesis and intermittent bilateral numbness persisted, she now could walk with the assistance of a cane and had only intermittent paresthesias of her legs.