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# Central Cord Syndrome Mimic-Bilateral Anterior Shoulder Dislocations: A Case Report

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## Abstract

Unilateral anterior shoulder dislocations are the most common major joint dislocation. However, bilateral shoulder dislocations are rare, and when present are mostly posterior. Given the rarity of this clinical entity, many emergency physicians would suspect central cord syndrome in a patient who presents with disproportionate weakness of the arms compared to the legs post trauma. This case report describes a 65-year-old woman presenting with inability to move both arms after she tripped. She displayed signs consistent with an initial diagnosis of central cord syndrome. Appropriate investigations led to the correct and timely diagnosis of bilateral anterior shoulder dislocations.

Bilateral shoulder dislocations are uncommon. Central cord syndrome can mimic similar clinical presentations, and vice versa. It is important for emergency physicians to recognise these pitfalls in diagnosis, and to increase awareness of this clinical entity to avoid future late or missed diagnoses.

## Introduction

Central cord syndrome is the most common form of incomplete spinal cord injury, characterized by disproportionately greater motor impairment in the upper extremities compared to the legs, with variable degree of sensory loss below the level of injury. This can occur in a setting of relatively mild trauma, usually a hyperextension injury to the neck, especially in patients with pre-existing cervical spondylosis [1].

Unilateral anterior shoulder dislocations are the most common major joint dislocation due to the anatomy and range of motion of the shoulder joint. However, bilateral shoulder dislocations are rare, and when present are mostly posterior. The myriad mechanisms by which this injury can be sustained and similarity in clinical presentation to central cord syndrome may contribute to delay diagnoses. A literature review by Dunlop et.al. [2] reports more than 10% of patients with bilateral anterior shoulder dislocation are diagnosed late. This case report describes a 65-year-old woman presenting with bilateral arm weakness after a fall. She was initially diagnosed to have central cord syndrome, but subsequently found to have bilateral shoulder dislocations.

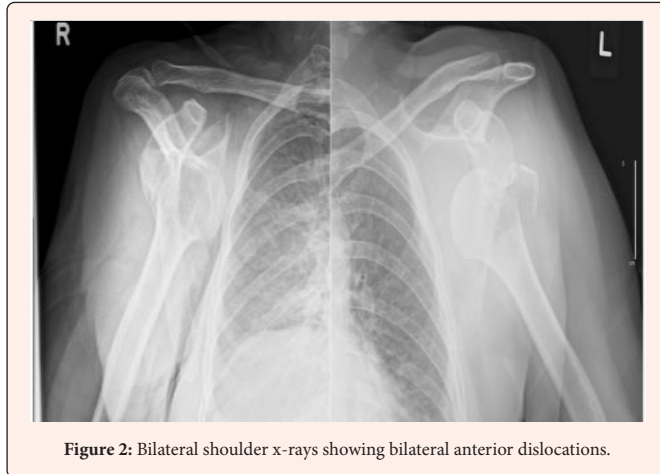
## Case Report



Figure 1: Cervical spine x-rays showing mild degenerative changes.

A 65-year-old woman presented to the emergency department with inability to move both arms and bilateral shoulder pain after she tripped and fell forward. She also complained of bilateral upper limb numbness. She broke her fall on outstretched hands. She did not sustain any head injury. She had no previous medical history, or history of shoulder dislocations. Physical examination showed no obvious deformity of her upper limbs, but she was unable to lift both arms against gravity. In addition, there was no sensory dermatomal loss on exam. There was tenderness over both shoulders. With a mechanism of a forward fall

and possibly hyperextension of her neck to avoid head injury, followed immediately by inability to move both arms, central cord syndrome was initially diagnosed. Radiographs of the cervical spine revealed mild degenerative changes of the cervical spine (Figure 1), and radiographs of both shoulders showed bilateral anterior shoulder dislocations (Figure 2).



**Figure 2:** Bilateral shoulder x-rays showing bilateral anterior dislocations.

Both shoulder joints were reduced under conscious sedation. Post reduction, she had full neurological recovery, and recovered full range of motion of both shoulder joints. She was admitted to the orthopaedics department and discharged few days later.

## Discussion

There are numerous causes of inability to move a limb, ranging from neurological to musculoskeletal. However, disproportionate inability to move both arms, compared to legs following a trauma in a fully conscious patient would lead most emergency physicians to suspect spinal cord injury, specifically central cord syndrome. Fractures involving both upper limbs would have a similar presentation. However, the diagnosis of fracture would be made easily as there would be obvious clinical deformity. Bilateral shoulder dislocations, a rare entity, have to be considered in a patient with inability to move both arms following trauma without obvious deformity.

Shoulder dislocations are the most common joint dislocation due to the laxity of the fibrous capsule as well as the small and shallow glenoid cavity, comprising 50.6% of all joint dislocations [3]. Bilateral anterior shoulder dislocations are its rarest form. A literature review conducted by Ballesteros et.al. [4] found only 68 reported cases in printed publication. In contrast, central cord syndrome is the most common incomplete acute spinal cord injury, accounting for approximately 70% of incomplete spinal injuries [5]. Ballesteros et.al. [4] performed a literature review of the 68 reported cases of bilateral anterior shoulder dislocations and delineated the mechanisms by which patients sustain this injury. They described the most common cause as trauma (50%) followed by muscle contractions (37%) due to seizures. Trauma subcategories included those produced by a lever mechanism (10%), where there was a forced extension, abduction, and external

rotation of the arm, those caused by direct or indirect traction (11.42%), those caused by a push on mechanism (backward, upward, or downward) (11.42%) such as in this patient; and those produced by mixed or unclear mechanisms (17.14%). There were also reported atraumatic (13%) bilateral dislocations, including lesions of undetermined mechanism (4%). The varied and nonspecific mechanisms by which bilateral anterior shoulder dislocations can be sustained mean mechanism of injury is not a reliable method of raising clinical suspicion of this diagnosis. O'Connor Read et.al. [6] described a case of delayed diagnosis of bilateral shoulder dislocation post seizure where the absence of loss of symmetry of the shoulders was cited as a factor for the delayed diagnoses, which was present in this patient. In the absence of obvious physical signs pointing towards this aetiology for disproportionate weakness in the upper limbs compared to the lower, clinicians can erroneously suspect spinal cord injury. Auerbach et.al. [7] described a case of missed bilateral shoulder dislocation which presented with only unilateral symptoms. The missed dislocation was attributed to distracting injury, with contributing confounder of the analgesia given for manipulation and reduction of what was initially thought to be a unilateral shoulder dislocation. Though not a factor in this case, it is another possible diagnostic pitfall to bear in mind.

## Conclusion

Bilateral anterior shoulder dislocations are the rarest of all shoulder dislocations. Clinicians often rely on multiple factors to increase the index of suspicion for injuries, for example, mechanism of injury or patient reported symptoms. Given the myriad mechanisms by which this injury can be sustained, the rarity of this clinical condition, and similarity in presentation to central cord syndrome, high clinical suspicion and low threshold for radiological imaging would aid in the identification of this condition.

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