Case Report
Open Access

Low-energy trauma causing multiple cervical fracture: a case report

Abstract

While cervical spine injuries account for only 3% of trauma cases, they represent a significant cause of morbidity and mortality, largely due to the spinal cord's crucial role in nervous innervation and its vulnerability in high-impact trauma. This case report details the presentation, diagnosis, and management of a 38-year-old male who sustained multiple cervical fractures following a fall into an empty pool. Initial symptoms included severe neck pain and headache, with an X-ray suggesting cervical fracture. Computed tomography (CT) confirmed fractures at C5, C6, and C7. This case underscores the importance of prompt and accurate imaging for managing cervical spine injuries and highlights the need for advanced diagnostic techniques beyond initial X-rays

Keywords: cervical fracture, spinous process fracture, vertebral body fracture, trauma

Volume 12 Issue 3 - 2024

Ricardo caravantes,[1] Andres Quezada,[1] Luis Jimenez[2]

[1]Department of Medical Research, Universidad Francisco Marroquin, Guatemala

[2]Department of Medical Research, Universidad San Carlos, Guatemala

Correspondence: Ricardo caravantes, Department of Medical Research, Universidad Francisco Marroquin, Guatemala, Email ricardocaravantes20@ufm.edu

Received: October 25, 2024 | **Published:** November 08, 2024

Introduction

The cervical spine is considered the most dynamic structure that protects the nervous innervation of all the body and thus the most vulnerable portion of the spinal conduct. [1,2] This type of injuries are the leading cause of mobility and mortality in trauma patients.[1] The most common mechanism of injury depends on the age of the patient.[3] Clinical presentation may vary, and even though prevalence is as low as 3% in trauma patients, all trauma patients are presumed to have a cervical spine fracture until proven otherwise and immobilization is required. [2,4] At the time the case report is written, there is no consensus as to the best method of imaging.[2] This case report displays the presentation, diagnosis, management and follow-up of a 39-year-old patient diagnosed with multiple cervical fractures following a motorcycle accident. The report intends to highlight the challenges and insights associated with these injuries.

Case report

A 38-year-old patient came walking to the emergency department after falling into an 1.5 meter empty deep-pool 1 hour ago. The patient denies any previous medical history. After interrogation, he referred mild headache and unbearable cervical pain. At the physical examination, vitals signs were stable. No denotable lesions were observed and significant rigidity and pain was referred when moving the neck. There was also edema in parietal and occipital regions of the head. The patient was placed on a stretcher and a philadelphia collar was applied.

Workup imaging consisted of X-Ray and CT which demonstrated a fracture of the vertebral body of C5 and C6 and the spinous process of C7 (Figure 1). Due to clinical instability of the fractures and risk of neurological compromise, the patient was admitted to the department of neurosurgery. MRI was performed to clear any spinal cord lesion (Figure 2). A posterior cervical fixation guided under fluoroscopy was planned to stabilize the spinal column and prevent potential neurological injuries. Post operatively, analgesics and anti-inflammatory medications were prescribed and physical therapy was recommended to regain cervical function. Follow up demonstrated no neurological compromise, and the patient referred to minimal pain. Cervical rotation was conserved and flexion and extension was restricted (Figure 3).

Figure 1 3D reconstruction revealing the C5 and C6 cervical fracture

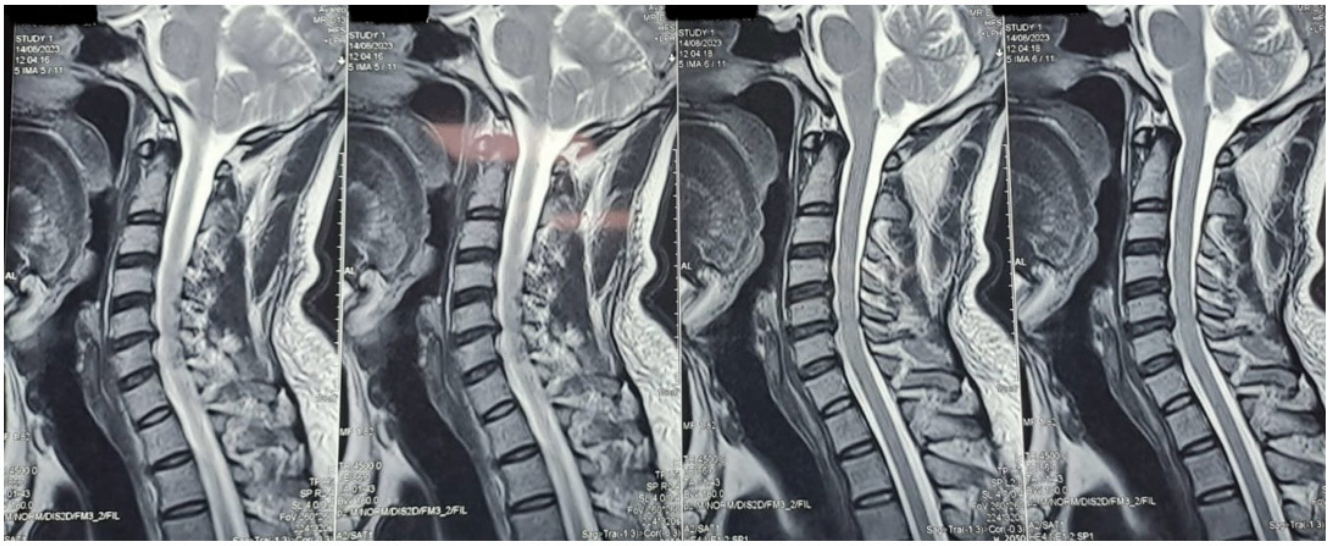

Figure 2 MRI performed to rule out spinal cord lesion.

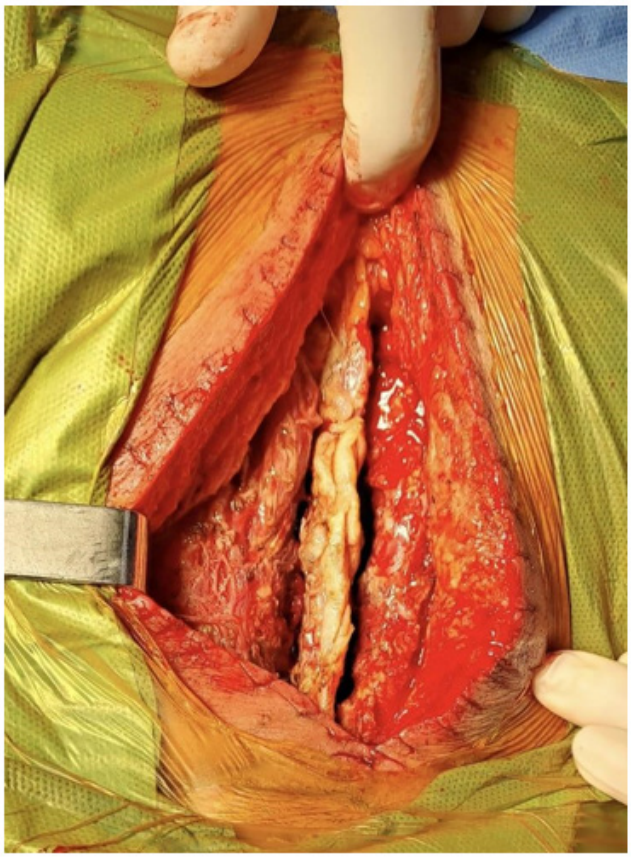

Figure 3 Spinous processes after lateral implantation.

Discussion

Traumatic spinal injuries are a significant public health concern due to the contexts in which they arise and their potential for severe outcomes.[5] The cervical spine, despite being structurally robust, is particularly vulnerable to injury because of its flexibility, especially during high impact traumas.[1,2]

The mechanism of cervical spine trauma is closely linked to both the patient's age and type oftrauma. In recent years, the average age of patients who suffered from cervical fractures has increased, averaging around 55 years.[6] This demographic shift reflects changes in the causes of spinal cord injuries, with motor vehicle accidents remaining the leading cause, followed by falls, violence and sport related incidents.[7] Younger individuals are more likely to sustain cervical spine injuries from high impact trauma, such as those from motor vehicle accidents or falls from significant heights. On the other hand, older individuals may experience cervical spine injuries from low-energy trauma, such as falls from a standing height, mostly due underlying osteoporosis.[6,7] The patient in this case, despite his relatively young age, and minor fall, resulted in fractures at multiple cervical levels, indicating a high impact nature of the trauma.

The initial clinical presentation of a spinal cord injury depends on where the injury occurs and how much of the spinal cord is damaged.[8] Cervical spine injuries can vary widely, ranging from mild pain to severe neurological deficits. In this case, the patient had severe neck pain, stiffness, and swelling in the occipital and parietal regions of the head but showed no immediate signs of neurological damage.[8] The absence of direct external injuries in the neck highlights the importance of maintaining a high index of suspicion for cervical spine lesion in neurological asymptomatic trauma patients. Initial management of patients with suspected cervical spine fractures involves applying a rigid cervical brace (hard collar) to immobilize the head and neck, thereby preventing further injury.[9] Assuming a cervical spine fracture until it is ruled out is crucial because failing to properly manage a fracture can lead to severe consequences. X-rays alone can sometimes be insufficient for accurately diagnosing cervical fractures, particularly in those involving the lower cervical vertebrae.[7,9]

As of now, there is no agreed-upon best imaging method for diagnosing cervical spine injuries. Nevertheless, it's important to perform spinal imaging promptly and have it reviewedby a trained healthcare professional to ensure accurate diagnosis and treatment.[10] While plain radiographs are still often the initial imaging step, it's important to note that they have largely been replaced by more advanced techniques like CT and MRI. These methods providebetter detail and accuracy in diagnosing cervical spine injuries, particularly

Citation: caravantes R, Quezada A, Jimenez L. Low-energy trauma causing multiple cervical fracture: a case report . *MOJ Surgery.* 2024;12(3):117–119.
DOI: 10.15406/mojs.2024.12.00276

in the lower cervical spine or in cases of subtle fractures, and cervical tu lumbar CT scan should be performed.[8,10,11]

Management depends on which cervical vertebrae is damaged and the kind of fracture sustained. Minor compression fractures can be treated with cervical braces worn for 8 weeks until bone herald. More complex or extensive fractures will require traction, surgery, a rigid cast or a combination of these treatments.[12]

Conclusion

The patient in this case report, a 38-year-old male who sustained multiple cervical fractures after falling into an empty pool, highlights the complexity and seriousness of such injuries. This emphasizes the importance of timely diagnosis and management to prevent complications such as paralysis.

Acknowledgments

None.

Conflicts of interest

The authors declare that there are no conflicts of interest.

References

1. McMordie JH, Viswanathan VK, Gillis CC. Cervical spine fractures overview. In: StatPearls. Treasure Island (FL): StatPearls Publishing; April 3, 2023.
2. Copley P, Tilliridou V, Jamjoom A. Traumatic cervical spine fractures in the adult. *BrJ Hosp Med (Lond)*. 2016;77(9):530–535.
3. Shank CD, Walters BC, Hadley MN. Current topics in the management of acute traumatic spinal cord injury. *Neurocrit Care*. 2019;30(2):261–271.
4. Tang A, Pawar J, Bridge C, et al. Traumatic cervical spine fracture patterns on CT: a retrospective analysis at a level 1 trauma center. *Emerg Radiol*. 2021;28(5):965–976.
5. Negrelli MAC, De Oliveira RG, Da Rocha ID, et al. Traumatic injuries of the cervical spine: Current epidemiological panorama. *Acta Ortop Bras*. 2018;26(2):123–126.
6. Passias PG, Poorman GW, Segreto FA, et al. Traumatic fractures of the cervical spine: analysis of changes in incidence, cause, concurrent injuries, and complications among 488,262 patients from 2005 to 2013. *World Neurosurg*. 2018;110:e427–e37.
7. Gandham S, Annis P. The principles of the advanced trauma life support (ATLS) framework in spinal trauma. *Orthopaedics and Trauma.* 2020;34(5):305–314.
8. Ahuja CS, Wilson JR, Nori S, et al. Traumatic spinal cord injury. Nature Reviews Disease Primers. Nature Publishing Group; 2017.
9. Beeharry MW, Moqeem K, Rohilla MU. Management of cervical spine fractures: a literature review. *Cureus.* 2021;13(4):e14418.
10. National Clinical Guideline Centre Spinal injury: assessment and initial management Spinal injury assessment: assessment and imaging for spinal injury NICE Guideline NG41 Methods, evidence and recommendations [Internet]. 2016.
11. Bonner S, Smith C. Initial management of acute spinal cord injury. *Continuing education in anaesthesia, Critical Care and Pain.* 2013;13(6):224–231.
12. Daniel K. Park, Md, FAAOS. Cervical Fracture (broken Neck). OrthoInfo. August 2021.