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Case Report

Sequential traumatic cervical fractures after paragliding accidents – A case report and literature review

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Received : 25 October 2020
Accepted : 15 December 2020
Published : 10 February 2021

DOI
10.25259/SNI_761_2020

Quick Response Code:

ABSTRACT

Background: Sports related cervical spine trauma may range from minor injuries to severe life-threatening fractures with spinal cord injuries as following paragliding accidents.

Case Description: A 52-year-old male sustained C4-C5 and C6-C7 fracture-dislocations (American Spinal Injury Association-D) attributed to a paragliding accident. He underwent a C5 corpectomy with C4-C6 anterior fusion. Three years later, he again sustained a paragliding accident, now resulting in a C6-C7 fracture-dislocation that required a C6-C7 anterior discectomy fusion. However, when this latter fusion "failed" 1 month later, he subsequently required a 360° fusion performed as a two-stage procedure. Further, 2 years later, he was involved in a motor vehicle accident resulting in an odontoid fracture.

Conclusion: Unstable spinal fractures require surgical fixation to prevent neurological injury. Long cervical fusions create lever arms that increase the stress to adjacent levels, rendering them prone to future injury.

Keywords: Cervical fusion, Cervical spine fractures, Paragliding accidents, Spinal cord injuries

INTRODUCTION

About 2–4% of all trauma patients have cervical spine injuries (CSIs), and roughly 20% sustain spinal cord injuries. The most common causes of CSI are falls and motor vehicle accidents, followed by diving into shallow water, firearm injuries, and sport activities; paragliding accidents are exceedingly rare.[1-3] Over the past 40 years, the percentage of incomplete tetraplegia attributed to CSIs has increased, with survival being strongly related to the extent of neurological impairment.[3] Here, we present a 52-year-old male who suffered two successive CSIs after paragliding accidents, requiring sequential anterior cervical procedures.

CASE REPORT

A 52-year-old male sustained a CSI in a paragliding accident following which he exhibited bilateral weakness in the C6 root distribution without myelopathy (e.g., consistent with American Spinal Injury Association [ASIA] Impairment Scale of D). The cervical X-ray/MR/

computed tomography (CT) studies identified C4-C5 and C5-C6 fracture-dislocations warranting an emergent C5 corpectomy with anterior C4-C6 iliac crest strut fusion with plating [Figure 1a and b]. He fully recovered neurological function. Three years later, he sustained another paragliding accident. This time, however, he remained intact (ASIA E) but the C6-C7 fracture/dislocation required a C6-C7 anterior cervical discectomy and fusion (ACDF) [Figure 2a,b and c]. Nevertheless, 1 month later, the patient's X-ray showed a C6-C7 repeat dislocation, warranting revision of the anterior fusion with concomitant posterior C3-T1 fusion [Figure 3a and b]. Two years later, following a motor vehicle accident, both X-rays and CT scan showed a displaced Type III Anderson and D'Alonzo odontoid fracture for which he was placed in a hard cervical collar for 1 year, resulting in adequate fusion [Figures 4 and 5]. Now, 9 years after the last fracture, the patient has returned to work as a truck driver and only complains of mild neck stiffness.

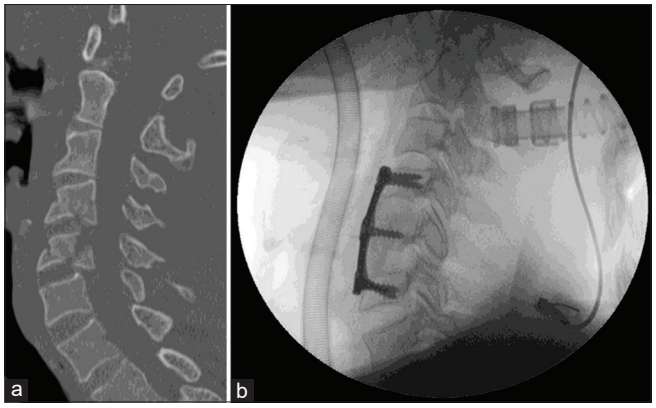

Figure 1: (a) Cervical fracture-dislocation. Admission computed tomography scan, May 2011: sagittal views. "Fracture-dislocation of the C4 vertebra on the C5 vertebra and C5 vertebra on the C6 vertebra with retrolisthesis. Associated laminar fractures and subdislocation of the facet joints of C4-C5 and C5-C6 (b) Cervical fracture-dislocation. Fluoroscopic intraoperative lateral view: C5 corpectomy with anterior cervical fusion with iliac crest autograft (Badgley and Bailey) and C4-C6 plate.

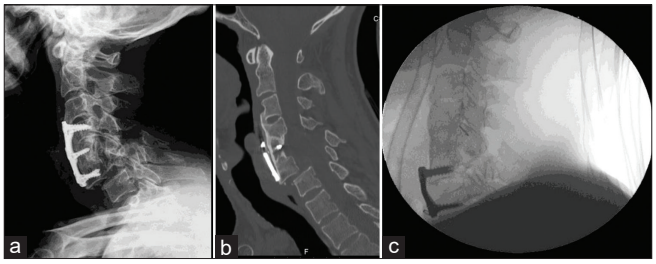

Figure 2: (a) Admission X-ray after second paragliding accident, March 2014: lateral view C6-C7 dislocation. (b) Admission computed tomography scan after second paragliding accident, March 2014: lateral view C6-C7 dislocation. (c) Fluoroscopic intraoperative lateral view: C6-C7 anterior cervical discectomy and fusion with iliac crest autograft (Smith-Robinson) and C6-C7 plate.

DISCUSSION

In this case report, the first paragliding accident caused a C4-C5 and a C5-C6 fracture-dislocation treated with a C5 corpectomy and C4-C6 strut/plated fusion. Two years later,

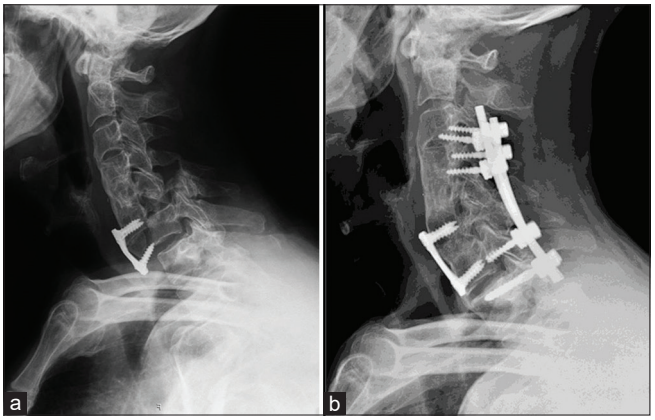

Figure 3: (a) One month postoperative X-ray: anteroposterior and lateral views – April 2014 – New C6-C7 dislocation. (b) Two months postoperative 360° fusion X-ray: lateral view – June 2014.

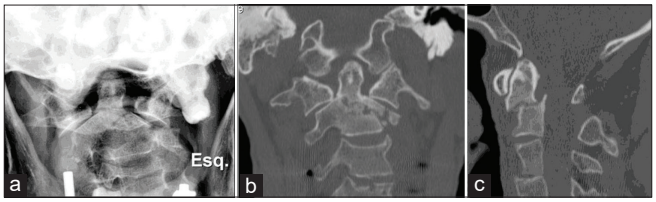

Figure 4: (a) Admission X-ray (transoral view) and computed tomography (CT) scan. (b) June 2016: Anderson and D'Alonzo Type III odontoid fracture with the left lateral mass extension (CT scan, coronal view) (c) June 2016: Anderson and D'Alonzo Type III odontoid fracture with the left lateral mass extension (CT scan, sagittal view).

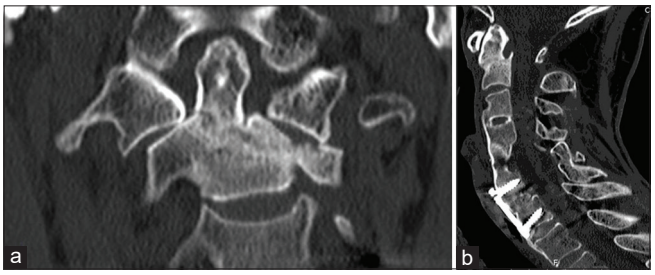

Figure 5: (a) Two months postodontoid fracture computed tomography (CT) scan, coronal view. (b) Two months postodontoid fracture CT scan, sagittal view.

the long lever arm increased the stress/susceptibility to the second paragliding accident resulting in a C6-C7 fracture requiring an ACDF.

When this second procedure failed within 1 postoperative month, the patient required an anterior C6-C7 revision plus a posterior C3-T1 fusion.

Here, the adjunctive posterior cervical fusion provided additional immediate stabilization and enhanced the probability of successful C6-C7 arthrodesis.[4]

CONCLUSION

This case highlights the importance of understanding the biomechanics behind cervical spine fusions and that long fusions may require posterior complementary spine stabilization. While the patient has been submitted to multiple surgical procedures he recovered fully from the initial neurological injury and shows complete union of his fractures

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

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How to cite this article: Pereira CS, Lopes AL, Rodrigues-Pinto R. Sequential traumatic cervical fractures after paragliding accidents – A case report and literature review. Surg Neurol Int 2021;12:47.