



Case Report

Treatment of unusual hangman's fracture in cluster region during coronavirus 2019 pandemic

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ABSTRACT

Background: Hangman's fractures are one of the most frequent types of high cervical spine injuries. Here, we present a quadriplegic patient due to a hangman's fracture treated during the coronavirus 2019 (COVID-19) pandemic.

Case Description: A 19-year-old male was quadriplegic and in spinal shock following a motor vehicle accident. X-rays showed a C2 hangman's fracture with instability. X-rays and CT studies both confirmed anterior dislocation at C2 on C3 with bilateral pedicle C2 fractures and 5 mm of subluxation. In addition, he had an infiltrate in both lungs consistent with the diagnosis of COVID-19. The patient was intubated for respiratory failure and hemodynamically stabilized for his spinal shock. Unfortunately, before surgical intervention could be undertaken, the patient sustained a fatal cardiorespiratory arrest.

Conclusion: Utilizing appropriate personal protective equipment, it was and should be possible to treat patients with spinal injuries in the presence of active COVID infection. However, the risks of treating such spinal urgencies and emergencies should be thoroughly discussed with the entire nonsurgical and surgical treatment teams (e.g., including anesthesiologists, physicians, nurses, and other caregivers).

Keywords: Coronavirus 2019, Hangman's fracture, Spinal shock, Spine surgery procedure

INTRODUCTION

The coronavirus 2019 (COVID-19) pandemic poses unique nonsurgical and surgical treatment challenges to spinal surgeons in Surabaya, Indonesia (e.g., black zone). Initially, all elective spinal surgeries were cancelled, and only emergent operations were performed. Here, we share our experience regarding the impact of the COVID-19 pandemic on the treatment of a patient with an acute cervical hangman's fracture in the presence of quadriplegia. We specifically focused on how all staff treating such spine-injured patients must utilize personal protective equipment (PPE).

CLINICAL CASE

A 19-year-old male sustained a motor bike accident. He presented with a loss of consciousness, difficulty breathing, and C3-level quadriplegia. X-rays and CT studies both confirmed anterior dislocation at C2 on C3 with bilateral pedicle C2 fractures and 5 mm of subluxation

[Figures 1 and 2]. The patient was in spinal shock and exhibited both hypotension and bradycardia. The thorax

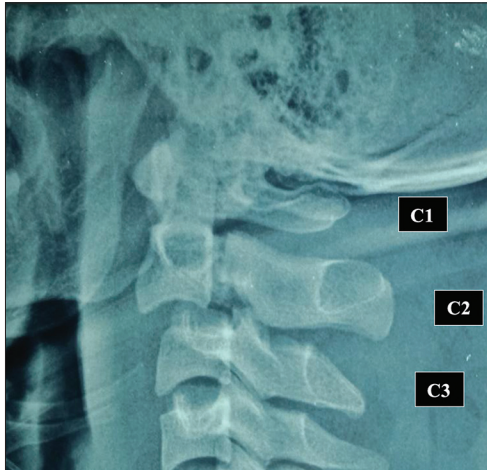


Figure 1: Lateral X-ray showing C2 vertebral body displaced anteriorly to C3 vertebral body.

X-ray and CT studies additionally demonstrated findings consistent with COVID-19 (e.g., bilateral lung infiltrates with the classic “ground-glass opacity”) [Figure 3]. Unfortunately, before surgical intervention could be undertaken, the patient sustained a fatal cardiorespiratory arrest.

DISCUSSION

Hangman's fractures, due to hyperextension-distraction injuries, are typically characterized by bilateral C2 pedicle fractures and dislocation/subluxation.^[4] However, as they are typically “decompressive injuries” involving a wide 22 mm C2 canal, they rarely result in quadriplegia.^[3] Here, the patient presented with quadriplegia and spinal shock due to a C2-C3 hangman's fractures. Although the Torg-Pavlov ratio (sagittal diameter between the spinal canal and vertebral body (>1) showed no canal stenosis [Figure 4], the CT documented a C2-C3 fracture dislocation accompanied by an extension/distraction spinal cord injury with hematomyelia

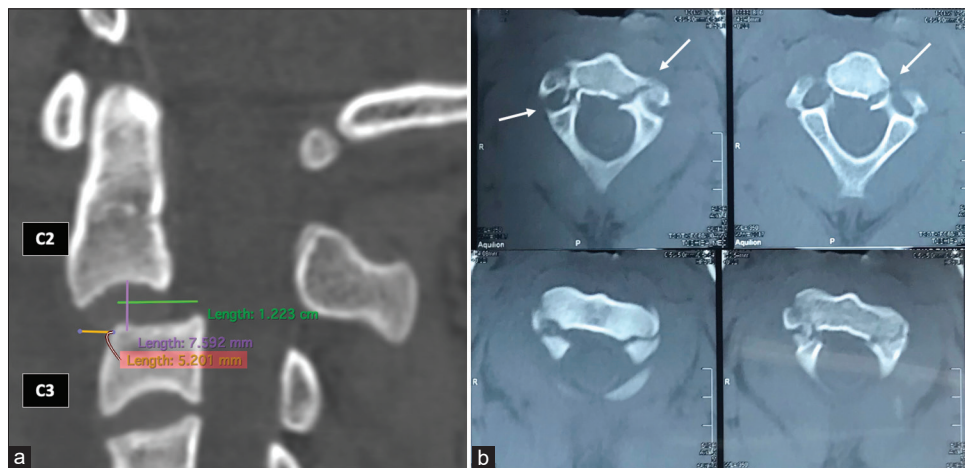


Figure 2: Cervical CT scan. Anterior dislocation of the vertebral body C2 to the vertebral body C3 with the length more than 5 mm (a); axial CT scan showing bilateral pedicle fracture of the C2 (arrow) without disturbance of the foramen transversarium of the C2 (b).

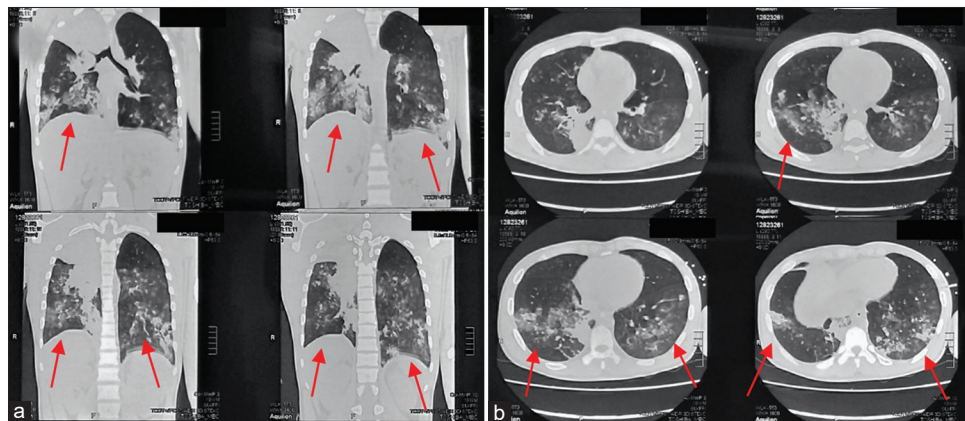


Figure 3: Thorax CT scan showing bilateral “ground-glass opacity” in the lung (arrow) in the coronal (a) and axial view (b).

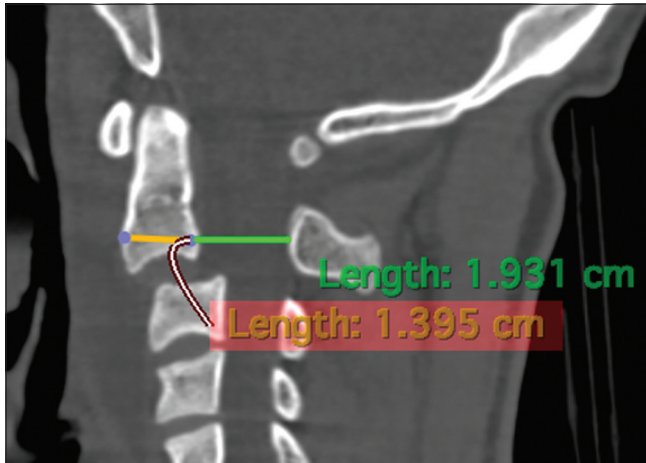


Figure 4: Measurement of the Torg-Pavlov Ratio or canal to body ratio of the C2 sagittal view in CT Scan showing the result is 1.38. If the score is <0.8 indication of cervical stenosis and the normal value is 1.0.

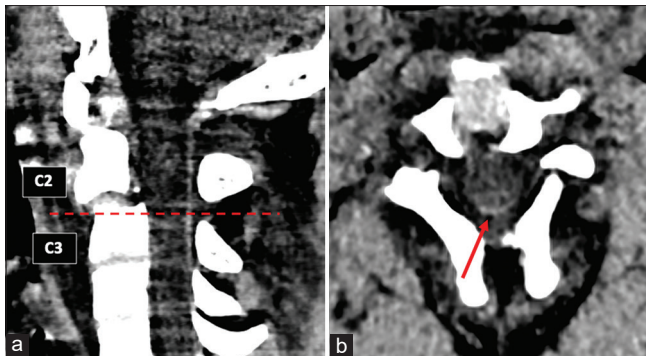


Figure 5: Cervical CT scan sagittal view (a) and axial view (b) of the C2 and C3 cervical spine. There is hematomyelia in the level of C2 and C3 (arrow).

[Figures 4 and 5].^[1] Although MR imaging is the gold standard for documenting and confirming the extent of cord and ligamentous injury for these lesions, the patient expired before this test, and surgery could be performed.^[5] Dealing with COVID-19 in Surabaya, Indonesia (e.g., black zone), for this case and similar cases in which patients are suspected as having COVID 19, all staff must routinely use PPE.^[2]

CONCLUSION

A COVID-19-positive quadriplegic patient was diagnosed utilizing X-ray and CT as having a C2-C3 fracture/dislocation injury (e.g., hangman's fracture) with hematomyelia. However, he expired before an MR and surgery could be performed. This case emphasizes the need to carefully screen/treat these patients, making sure that all medical staffs appropriately utilize full PPE.

Declaration of patient consent

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

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Nil.

Conflicts of interest

There are no conflicts of interest.

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