American Journal of Case Reports

ISSN 1941-5923
© Am J Case Rep, 2017; 18: 1256-1260
DOI: 10.12659/AJCR.907396

Received: 2017.10.03
Accepted: 2017.11.06
Published: 2017.11.28

Isolated C5 Vertebrae Dislocation with Trauma: An Extremely Rare Case of Isolated C5 Dislocation

Authors' Contribution:
Study Design A
Data Collection B
Statistical Analysis C
Data Interpretation D
Manuscript Preparation E
Literature Search F
Funds Collection G

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Conflict of interest: None declared

Patient: Female, 36
Final Diagnosis: Isolated C5 vertebra dislocation
Symptoms: Tetraplegia
Medication: —
Clinical Procedure: C5 corpectomy and anterior stabilization
Specialty: Neurosurgery

Objective: Rare disease

Background: Total spondylolisthesis, or dislocation of 1 cervical vertebrae, is only caused by high-energy trauma and is usually fatal. Cervical spine fractures and dislocations often cause 3-column structural damage to the cervical spine, injury to the spinal cord, and precipitating alignment of the cervical vertebrae, as well as cervical instability, which are detrimental, show poor prognosis, and are associated with high rates of mortality rate and disability.

Case Report: We report an extremely rare case of isolated C5 dislocation caused by falling out of a tree, with sudden tetraplegia.

Conclusions: Total spondylolisthesis or dislocation of 1 cervical vertebrae can be surgically treated with anterior approach because it is possible to completely remove the vertebra body, intervertebral disc, and bone fragments, to directly decompress the spinal cord with stabilization.

MeSH Keywords: Cervical Vertebrae • Dislocations • Spinal Cord Injuries

Full-text PDF: https://www.amjcaserep.com/abstract/index/idArt/907396

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Background

Total spondylolisthesis, or dislocation of 1 cervical vertebrae, only occurs due to high-energy trauma and is usually fatal. Traumatic high-grade cervical spinal dislocations are rare injuries, generally associated with severe neurologic compromise [1]. Cervical spine fractures and dislocations often cause 3-column structural damage to the cervical spine, injury to the spinal cord, and precipitating alignment of the cervical vertebrae, as well as cervical instability. All these symptoms are detrimental, showing poor prognosis and high rates of mortality and disability [2].

The most effective and direct method to achieve reduction as early as possible is the removal of spinal cord compression, reducing neuronal death and recovering neurological function [3].

This report is based on an extremely rare case of an isolated C5 dislocation with sudden tetraplegia due to falling from a tree. The literature was searched and search engines were used with many keywords, including 'isolated cervical dislocation, cervical total spondylolisthesis, C5 dislocation, C5 spondylolisthesis', but a similar isolated C5 dislocation or total spondylolisthesis could not be found.

Case Report

A 36-year-old female sought emergency services after experiencing sudden tetraplegia after falling from a tree. She could not breathe properly, her eyes opened spontaneously, and she could speak regularly but could not localize pain. A neurological examination found tetraplegia, anesthesia under the dermatome level C5, and anal sphincter tonus absent, and she required a urinary catheter because of incontinence.

Radiodiagnostic testing was conducted using computed tomography (CT), magnetic resonance imaging (MRI), and CT angiography. A high-grade C5 isolated dislocation was seen on images (Figures 1–3). A CT angiography demonstrated no vascular injury to the vertebral artery.

The patient was brought to the operating room and intubated with a fiber-optic system. An anterior approach was preferred because immediate decompression and stabilization could occur using anterior C5 corpectomy and stabilization at C4–C6 could occur with plaque fixation. When the C5 level was reached, a small piece of vertebrae was found in the anterior compartment. After the bone was removed, the hematoma in

Figure 1. Preoperative MRI sagittal T2 image.

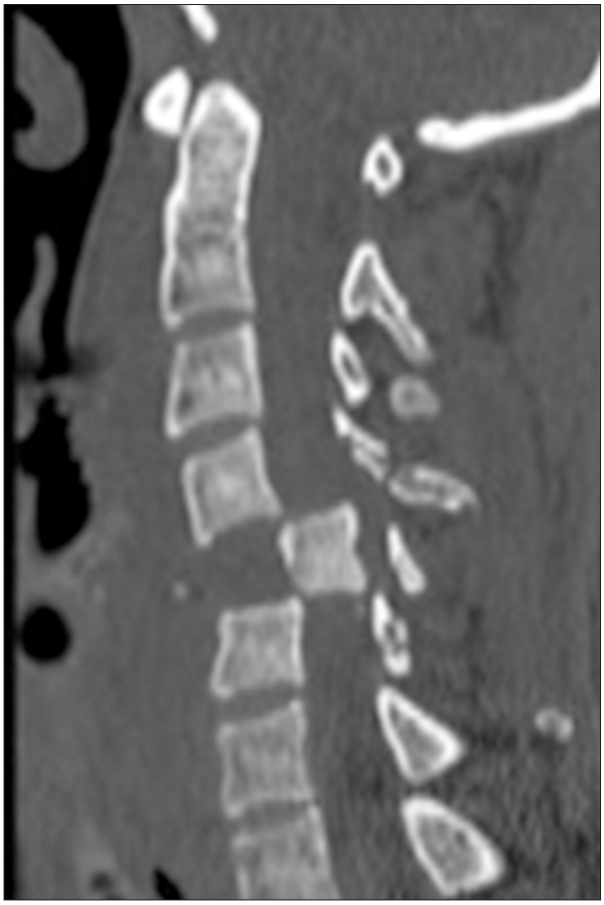

Figure 2. Preoperative CT sagittal image.

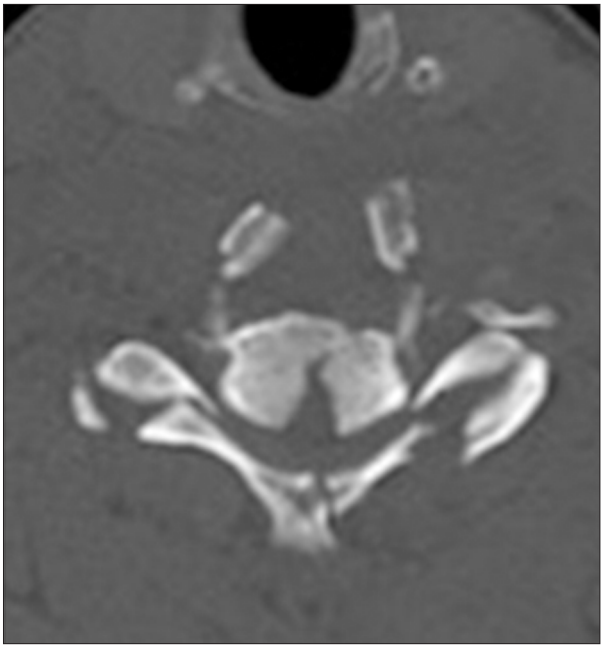

Figure 3. Preoperative CT axial image.

the dislocation area was cleaned. Then, the corpus from the spinal canal was removed with a Cavitron Ultrasonic Surgical Aspirator (CUSA), including bone tip and disc materials. The dura mater was damaged and cerebrospinal fluid was leaking. A self-sticking dura graft was applied to the defect area. The level was stabilized with an elevating cage and anterior plaque fixation system. The stabilization process was checked with a C-arm scope (Figure 4). There was no intraoperative camera recording system available, so no pictures or records could be taken.

Postoperatively, the patient had CT and X-ray imaging, which revealed proper instrument placement (Figures 5–7). The patient awoke in the intensive care unit. She could speak regularly but had breathing problems, so she was intubated and ventilated with continuous positive airway pressure (CPAP) mode. Three days later, she had a tracheostomy. Ten days later, she could breathe regularly without a ventilator. The patient is still under observation in the Physiotherapy Department with a tracheostomy. She can perform small movements with fingers and toes, but there is no improvement in anal sphincter tonus and she still requires a urinary catheter due to incontinence.

Discussion

Total spondylolisthesis, or dislocation of 1 cervical vertebrae, can only occur with high-energy traumas like motor vehicle collisions, diving accidents, or severe falls. Traumatic cervical spine fractures and dislocations are common in clinical practice, but high-grade traumatic cervical spondylolisthesis is a

Figure 4. Perioperative C-arm X-ray sagittal image.

rare, and often neurologically devastating, injury [4]. However, the poor prognosis, as well as high rates of mortality and disability arising from such injuries, is under intensive study in the field of the spine and spinal cord injuries [3].

Radiodiagnostic tests must be done to choose a treatment modality. A detailed 3D reconstructive CT should be performed to evaluate the fracture, subluxations, and dislocations. MRI can be performed to analyze the spinal cord and ligamentous injuries, and CT angiography can be performed to demonstrate a vascular injury.

After the evaluation of diagnostic tests, it is important to decide on the surgical approach. The anterior approach is useful for performing an urgent decompression of the spinal cord and an anterior fixation. The posterior approach can be used for stabilization with polyaxial screws. If there must be a decompression and posterior instrumentation, both approaches can be performed. In such cases, anterior decompression, stabilization, and plaque fixation are preferred.

Figure 5. Postoperative CT sagittal image.

Figure 6. Postoperative CT axial image.

During the postoperative period, patients must be followed up to observe complications or neurological conditions. Cerebrospinal fluid fistulas, hematomas, infections, and instrumentation malpositioning and damage are some examples of such complications. In this case, a cerebrospinal fluid fistula did not occur, despite attaching a self-sticking dura graft to the damaged spinal cord area. Neurological conditions should be handled by the Physiotherapy Department immediately after surgery.

Figure 7. Postoperative cervical vertebral X-ray.

Conclusions

Total spondylolisthesis, or dislocation of 1 cervical vertebrae, can be surgically treated using an anterior approach because the vertebra body, intervertebral disc, and bone fragments can be removed completely and direct decompression of the spinal cord with stabilization can be achieved.

Conflict of interest

None.

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