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Case Report

Acute tonsillar cerebellar herniation in a patient with traumatic dural tear and VAC therapy after complex trauma

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Abstract

BACKGROUND CONTEXT: Cases of cerebral hypotension and tonsillar herniation after accidental lumbar cerebrospinal fluid (CSF) drainage or chest tube drainage with intrathoracic CSF leaks have been reported. To the authors' knowledge, this case presents the first report of severe intracranial hypotension because of suction of CSF by a Vacuum-Assisted Closure (VAC) device.
PURPOSE: The purpose of this study was to report a life-threatening intracranial hypotension in a polytraumatized patient after VAC therapy.
STUDY DESIGN: This study is a case report.
METHODS: A 23-year-old woman suffered of a Grade 3 open pelvic fracture after a motor vehicle accident. After a VAC therapy, the patient became nonresponsive. A cranial computer tomography (CCT) showed signs of intracranial hypotension with narrowing of the basal cisterns and sagging of the cerebellar tonsils. The VAC was removed. Further neuroradiological diagnostic showed a tear in the dural sac at the L5–S1 level. The patient consequently underwent neurosurgery. After a dural patch, she was oriented postoperatively and the CCT improved to a normal state.
RESULTS: Fifteen days after admission, the patient was discharged without neurologic sequelae.
CONCLUSIONS: Severely injured patients undergoing VAC therapy with secondary neurologic deterioration not because of head injury should be appropriately diagnosed to rule out dural laceration and cranial hypotension.

Keywords: Trauma; VAC; Intracranial hypotension; Tonsillar herniation; Dural tear; Cerebrospinal fluid

Introduction

Cases of cerebral hypotension and tonsillar herniation after accidental lumbar cerebrospinal fluid (CSF) drainage or chest tube drainage with intrathoracic CSF leaks have been reported. To the authors' knowledge, this case presents the first report of severe intracranial hypotension because of suction of CSF by a Vacuum-Assisted Closure (VAC; Kinetic Concepts, Inc., San Antonio, TX, USA) device.

FDA device/drug status: Not applicable.

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Fig. 1. Intraoperative picture showing a Grade 3 open pelvic fracture on the right side, the gluteal vessels, and limp vessels (iliaca externa vessels) are clamped off.

Case report

A 23-year-old patient was admitted to the emergency department of an outside hospital after a motor vehicle accident. Initial examination showed a Grade 3 open pelvic fracture on the right side.

Hemoglobin level at admission was 3 g/dL. The patient was intubated by the emergency doctor on the street. From the emergency doctor protocol, it can be concluded that the injured limb was not perfused, and there was no sensitivity or motor reaction in the injured limb. As first treatment, the gluteal vessels and limp vessels (iliaca externa vessels) were clamped off in the emergency room of the first treating hospital by the trauma surgeons on call (Fig. 1). After hemodynamic stabilization with 10 units of packed red blood cells, 2 units of thrombocytes, and 8 units of fresh frozen plasma, the patient was transferred to university hospital. At this time, the leg had been ischemic for 5 hours.

Computed tomography (CT) showed a Grade 3 open pelvic fracture (pelvic fracture Type C), instability of the sacroiliac joint, and a Grade 3 open fracture of the left tibia. The CT showed air in the thecal sac so that a dural tear was suspected. Cranial CT (CCT) at this time was normal (Fig. 2).

The patient was immediately transferred to the operating room where a hemipelvectomy including an occlusion of the external iliac artery were carried out. The wound was sealed, and negative pressure was applied (VAC). The vacuum therapy was done with continuous suction of 75 mmHg. In a single session, an external fixation for the left tibia fracture and an explorative laparotomy including a protective ileostomy were performed. Further surgery had to be carried out 2 and 4 days later, including a debridement, changes of the VAC, and fixation of the right sacroiliac joint with screws.

Following another change of the VAC 4 days after the accident, the patient became somnolent and nonresponsive (Glasgow Coma Scale score, 6). There was no obvious change in the output from wound drainage. The drain was not tested for CSF. An emergency CCT showed signs of intracranial hypotension with effacement of the basal cisterns and sagging of the cerebellar tonsils (Fig. 3). Suspecting a lumbar CSF leakage, an

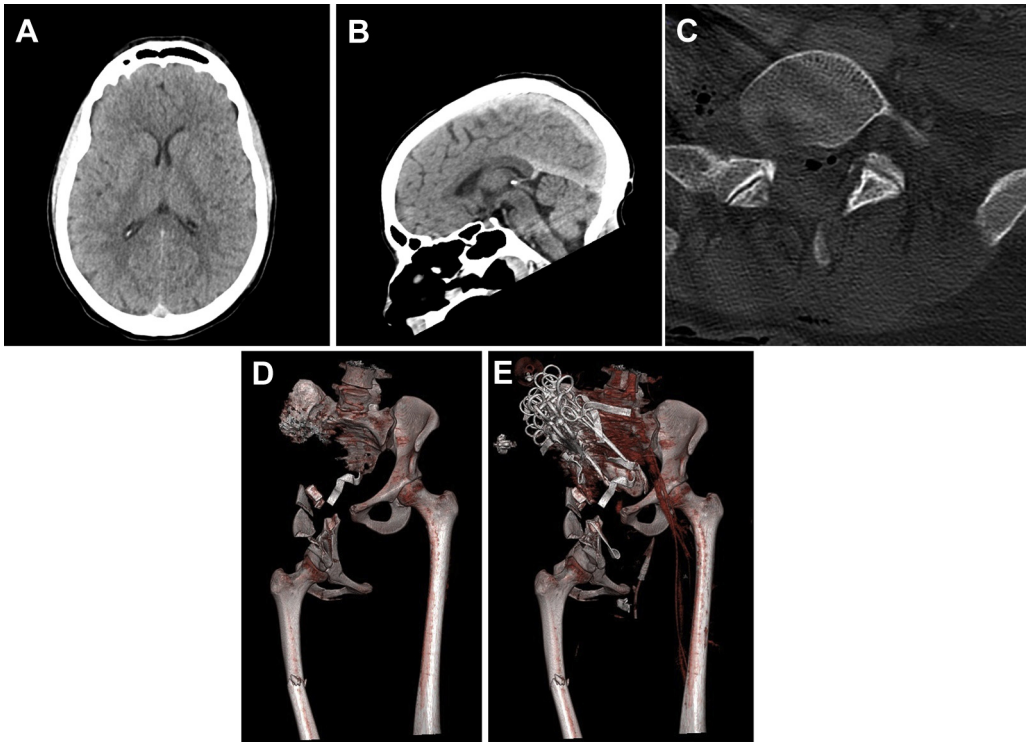

Fig. 2. The initial computed tomography scan. (A) Head axial, (B) head sagittal MPR, (C) spine axial with intrathecal air, and (D and E) bone reconstruction showing a Grade 3 open pelvic fracture on the right side. MPR, multiplanar reconstruction.