

Case report

CSF Leak- A rare cause of clear discharge from Neck wound

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Received: 11.08.2026, Revised: 13.09.2026, Accepted: 15.10.2026

ABSTRACT

Background: Traumatic cerebrospinal fluid (CSF) leakage through an external cervical wound is a rare clinical presentation, particularly in the absence of classical symptoms. Early recognition and accurate diagnosis are essential to prevent potentially serious complications.

Case Presentation: A 45-year-old male presented following a road traffic accident involving blunt trauma to the right side of the neck caused by a motorcycle handle. Clinical examination revealed a sutured lacerated wound measuring 7 × 1 cm with diffuse cervical swelling. Initially, serosanguineous discharge was observed for two days, followed by persistent clear, watery discharge without other significant symptoms. Salivary and chylous leakage were initially considered. Routine laboratory investigations were within normal limits. Magnetic resonance imaging (MRI) demonstrated spinal cord edema at C5-C6 and a prevertebral fluid collection extending from the skull base to C7. Fluid analysis revealed increased glucose levels, raising suspicion of CSF leakage. Computed tomography (CT) cisternography confirmed a 2 × 2.1 mm dural tear at the right C5-C6 neural foramen with intrathecal contrast extravasation, associated with minimally displaced fractures of C5, C6 and C7.

Conclusion: Persistent clear discharge following cervical trauma should raise suspicion of CSF leakage, even without classical symptoms. CT cisternography is valuable for confirming dural injury, while early diagnosis and individualized multidisciplinary management may help prevent complications.

Keywords: Cerebrospinal Fluid Leak, Cervical Spine Trauma, Dural Tear, CSF Fistula, CT Cisternography, Conservative Management.

INTRODUCTION

Cerebrospinal fluid (CSF) is a clear, colourless fluid surrounding the brain and spinal cord that provides mechanical protection, maintains neurological homeostasis and facilitates metabolic waste removal [1]. CSF leakage occurs following disruption of the dural and arachnoid membranes, resulting in abnormal communication between the subarachnoid space and surrounding tissues. CSF leaks may be traumatic, iatrogenic or spontaneous. Although traumatic CSF rhinorrhoea and otorrhoea are well-recognised complications of cranial injuries, leakage through an external cervical wound is exceptionally uncommon [2]. Traumatic cervical CSF leakage may result from vertebral fractures, penetrating injuries or blunt trauma causing dural disruption. Clinical manifestations vary from orthostatic headache, neck pain and localized fluid collections to persistent external watery discharge [3]. Occasionally, patients remain asymptomatic

apart from wound leakage, making diagnosis challenging. Such presentations may initially be mistaken for salivary leakage, chylous fistula or serous wound discharge. Delayed recognition may increase the risk of intracranial hypotension, pseudomeningocele formation, meningitis and impaired wound healing [4]. Diagnosis requires careful clinical assessment supported by biochemical investigations and advanced imaging. Although fluid glucose estimation may suggest CSF leakage, beta-2 transferrin and beta-trace protein provide greater diagnostic specificity. Magnetic resonance imaging (MRI) helps identify spinal cord abnormalities and associated fluid collections, whereas computed tomography (CT) demonstrates vertebral injuries. CT cisternography or myelography enables precise localization of dural defects through visualization of intrathecal contrast extravasation [5–7]. Management depends on the severity of injury, neurological status and

persistence of leakage. Conservative treatment may include bed rest, head elevation and selected pharmacological measures, whereas persistent leakage or complications may require surgical intervention [8]. The present case report describes a 45-year-old male presenting with persistent clear discharge from a sutured cervical wound following blunt neck trauma. CT cisternography confirmed a dural tear at the right C5–C6 neural foramen associated with cervical vertebral fractures. This case highlights the importance of early suspicion, accurate diagnosis and multidisciplinary management of atypical traumatic cervical CSF leakage.

Case Presentation

A 45-year-old male patient was referred for further evaluation and management following a road traffic accident (RTA) resulting in an injury to the right side of the neck. The patient had sustained blunt trauma to the cervical region due to direct impact from the handle of a motorcycle. The injury resulted in a lacerated wound over the right side of the neck, which had been sutured before referral.

On presentation, the patient had a sutured wound over the right cervical region associated with diffuse swelling. Initially, serosanguineous discharge was observed from the suture line for approximately two days following the injury. Subsequently, the nature of the discharge changed to clear, watery fluid, which continued to leak from the wound. Despite the persistent watery discharge, the patient did not exhibit other significant associated symptoms suggestive of cerebrospinal fluid (CSF) leakage. The absence of classical clinical manifestations made the initial diagnosis challenging. Considering the anatomical location of the wound and the nature of the discharge, the possibility of salivary or chylous leakage was initially considered. However, the persistence of clear fluid discharge following cervical trauma raised suspicion of an underlying CSF leak, necessitating further diagnostic evaluation.

On local examination, a sutured lacerated wound measuring approximately 7×1 cm was identified on the right side of the neck. The wound was located between the posterior border of the right sternocleidomastoid muscle and the midline, approximately 3 cm above the right clavicle. Diffuse swelling was present over the right cervical region surrounding the site of injury. Examination of the wound revealed persistent fluid discharge through the suture line. The discharge was initially serosanguineous but subsequently became

clear and watery. The unusual character of the discharge, particularly in the setting of blunt cervical trauma, suggested the possibility of communication with a deeper anatomical compartment. Although the clinical presentation was not accompanied by other significant symptoms, the persistent leakage warranted further investigation to identify its source and exclude an underlying dural injury. The initial diagnostic evaluation focused on identifying the source of the persistent clear fluid discharge from the cervical wound. Given the location of the injury and the nature of the discharge, salivary leakage and chylous leakage were considered among the differential diagnoses. Salivary leakage was considered because of the possibility of injury to adjacent salivary structures, whereas chylous leakage was considered because of the anatomical proximity of cervical lymphatic channels. However, the history of significant blunt cervical trauma and the persistent watery nature of the discharge raised concern regarding a possible traumatic CSF fistula. Routine laboratory investigations were performed and were reported to be within normal limits. As the initial clinical findings and routine investigations did not establish the source of the fluid, advanced imaging and fluid analysis were undertaken. Magnetic resonance imaging (MRI) of the cervical spine was performed to evaluate the underlying cervical structures and identify possible traumatic abnormalities. MRI demonstrated a short segment of spinal cord edema at the C5–C6 vertebral level, suggesting trauma-related spinal cord involvement. Additionally, a thin, elongated prevertebral fluid collection was identified, extending from the skull base to the C7 vertebral level. The presence of a prevertebral collection in association with cervical trauma and persistent clear discharge raised suspicion of a deeper fluid leak. However, further imaging was required to establish the exact site of leakage and demonstrate a communication with the subarachnoid space. Computed tomography (CT) cisternography of the cervical spine was subsequently performed to identify the source of the suspected CSF leakage. The examination demonstrated a dural sac tear measuring approximately 2×2.1 mm at the right neural foramen at the C5–C6 intervertebral level. Leakage of intrathecally administered contrast material was visualized through the dural defect, confirming communication between the subarachnoid space and the surrounding tissues. Additionally, minimally displaced

fractures involving the C5, C6 and C7 vertebrae were identified. These findings established the presence of a traumatic dural injury associated with cervical vertebral fractures. The demonstration of intrathecal contrast extravasation at the C5–C6 level provided radiological confirmation of the CSF leak and explained the persistent clear fluid discharge from the cervical wound. Analysis of the fluid discharged from the cervical wound was undertaken to determine its possible origin. The fluid demonstrated an increased glucose level, which was considered compatible with CSF in the clinical context. Although this finding raised suspicion of CSF leakage, fluid glucose analysis alone was not sufficient to establish the diagnosis conclusively. The diagnosis was subsequently confirmed by CT cisternography, which demonstrated a dural defect and extravasation of intrathecal contrast at the right C5–C6 neural foramen. The combination of the clinical presentation, fluid analysis and radiological findings supported the diagnosis of a traumatic cervical CSF leak presenting through an external neck wound. Based on the clinical history, examination findings, fluid analysis and radiological investigations, the patient was diagnosed with traumatic cervical cerebrospinal fluid leakage secondary to a dural sac tear at the right C5–C6 neural foramen, associated with minimally displaced fractures of the C5, C6 and C7 vertebrae. The diagnosis was particularly unusual because the patient presented primarily with persistent clear, watery discharge from a sutured cervical wound without other significant classical symptoms of CSF leakage. Following confirmation of the diagnosis, the patient was managed conservatively. Specialist opinions from the Departments of Neurosurgery and Orthopaedics were obtained to assess the cervical spine injury and determine the appropriate management strategy. The conservative treatment protocol included strict bed rest with elevation of the head. This approach was adopted to facilitate spontaneous closure of the dural defect and reduce continued leakage. Medical management included oral acetazolamide at a dose of 250 mg three times daily (TDS), administered with a tapering regimen over 15 days. Acetazolamide was used to reduce CSF production and thereby potentially facilitate healing of the dural defect. Prophylactic antibiotics were also administered as part of the treatment protocol. The patient was managed under specialist supervision, with attention to the risk of complications associated

with persistent CSF leakage and cervical spine trauma. No operative intervention was reported in the available case record, and conservative treatment was continued. Following conservative management, the patient remained under follow-up. The available clinical record reported that the patient had not developed any complications during the documented follow-up period. The absence of reported complications was encouraging in the context of a traumatic cervical dural injury managed without surgical intervention. This case illustrates an uncommon presentation of traumatic cervical CSF leakage manifesting as persistent clear, watery discharge from an external neck wound. Unlike more commonly recognized presentations of CSF leakage, the patient did not exhibit other significant classical symptoms, creating a diagnostic challenge. The initial consideration of salivary and chylous leakage highlights the importance of a broad differential diagnosis when evaluating persistent fluid discharge following cervical trauma. MRI identified associated cervical spinal cord edema and an extensive prevertebral collection, while CT cisternography was useful in demonstrating the precise dural defect and confirming active CSF leakage.

DISCUSSION

Traumatic cerebrospinal fluid (CSF) leakage through an external cervical wound is an uncommon manifestation of spinal dural injury and may present diagnostic challenges, particularly in the absence of classical symptoms. In the present case, a 45-year-old male developed persistent clear, watery discharge from a sutured right cervical wound following blunt trauma sustained during a road traffic accident. Initially, salivary and chylous leakage were considered; however, subsequent investigations confirmed a traumatic CSF fistula. A previously published case report described a 23-year-old male presenting with persistent clear fluid leakage from a lumbar stab wound five days after injury, associated with postural headache. Ferrer et al. [9] reported CSF leakage was confirmed through biochemical investigations, including beta-2 transferrin testing. Unlike this case, our patient sustained blunt cervical trauma without other significant associated symptoms, highlighting the variable clinical presentation of traumatic CSF fistulas. Mica et al. (2010) [10] reported a 75-year-old woman with a traumatic odontoid fracture who developed a cervical CSF fistula and subsequently communicating

hydrocephalus approximately four weeks after injury, requiring ventriculoperitoneal shunting. In contrast, no complications were reported during follow-up in our patient, emphasizing the importance of early diagnosis and appropriate management. Haft et al. (2004) [11] described a 47-year-old woman who developed a subarachnoid–pleural fistula following thoracic spinal surgery, with CSF leakage confirmed using beta-2 transferrin testing. In the present case, fluid glucose analysis raised suspicion, while CT cisternography confirmed a 2 × 2.1 mm dural tear at the right C5–C6 neural foramen, associated with minimally displaced C5–C7 vertebral fractures. Another Zhang et al. [12] reported that case involving an eight-year-old child with penetrating craniocervical trauma demonstrated favourable neurological recovery following conservative management and rehabilitation, with complete recovery reported at eight months. Similarly, our patient was managed conservatively with bed rest, head elevation, acetazolamide and prophylactic

antibiotics, without reported complications during follow-up.

CONCLUSION

Traumatic cerebrospinal fluid (CSF) leakage through an external cervical wound is a rare clinical presentation that may occur without classical symptoms, making early diagnosis challenging. The present case highlights the importance of maintaining a high index of suspicion in patients presenting with persistent clear, watery discharge following neck trauma. CT cisternography played a crucial role in confirming the dural defect and identifying the site of CSF leakage. Conservative management with multidisciplinary consultation was associated with a favourable reported clinical course without complications during follow-up. Early recognition, appropriate radiological evaluation and individualized management are essential to minimize potential complications and improve patient outcomes.



Figure 1: Diffuse Swelling Present Over Rt Side of Neck

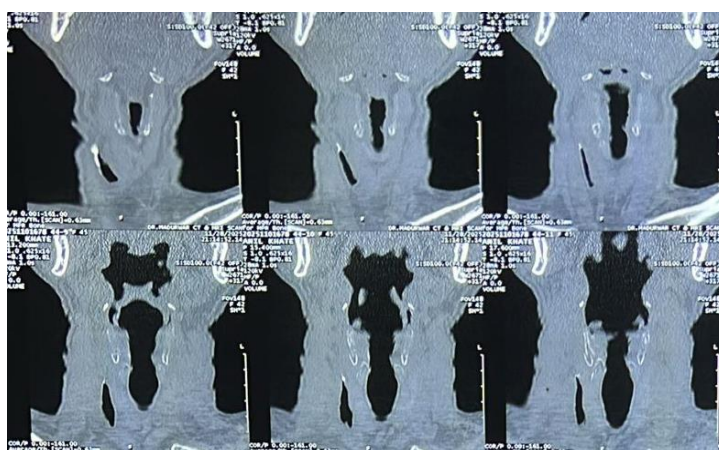




Figure 2: MRI Cervical Spine – Short Segment Cord Edema at C5-C6 Vertebral Level. Thin Elongated Prevertebral Collection Seen From Skull Base to C7 Vertebral Level.

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