

Letter to the Editor: New Observation

Watch and Wait: Successful Conservative Management for a Traumatic Dural Defect at the Cervicomedullary Junction

Matthew Redmond¹ , Amparo Wolf^{2,3} and Stuart McGregor^{2,3}

¹Undergraduate Medical Education Program, NOSM University, Sudbury, ON, Canada, ²Division of Clinical Sciences, NOSM University, Sudbury, ON, Canada and

³Division of Neurosurgery, Health Sciences North, Sudbury, ON, Canada

Non-traumatic dural laceration, such as those from traumatic spinal cord injury (tSCI), is infrequently documented. Given the risk of complications like pseudomeningocele or meningitis, thoughtful management is required. However, consensus on management remains limited.¹ For defects sustained intraoperatively, suture repair is recommended. However, for patients presenting without other operative indications, surgery carries potential risks that may be unnecessary considering the possible success of conservative management. We report a case of a large traumatic dural defect and associated pseudomeningocele that was successfully treated with observation and bedrest.

An otherwise healthy 30-year-old right-handed female presented to the emergency department with a traumatic penetrating spinal cord injury transecting the left half of the cervicomedullary junction. She was stabbed with suspected kitchen knife, estimated to have a width of 1–2 cm given her injuries. The patient reported that as the knife penetrated her posterior left neck, she immediately lost control of her body, causing her to collapse – unable to move. She also sustained multiple superficial lacerations.

Upon presentation to the hospital, her lacerations were reapproximated by the Trauma Team. Her clinical examination revealed findings consistent with a hemicord syndrome. Physical examination found left-sided motor weakness and decreased sensation to light touch, as well as contralateral loss of sensation to pin prick. Notably, the patient was allodynic on the left side. The neck wound site was tender and swollen; she also reported an enduring headache demonstrating some positionality following admission.

Initial diagnostic investigation included computed tomography angiogram (CTA) and CT head. The CTA revealed a left V3 vertebral artery dissection and an air-filled penetrating wound passing intradurally between the occiput and C1 level. The CT head identified subarachnoid hemorrhage in the posterior fossa extending to the upper cervical spine.

On post-injury day (PID) #3, an magnetic resonance imaging (MRI) total spine was performed diagnosing a pseudomeningocele affecting the left suboccipital and paraspinal regions around C1 (Figure 1, panels A–D). It measured roughly 5.5 × 3.8 × 3.0 cm and was associated with a roughly 0.8 cm (craniocaudal) × 1.2 cm (mediolateral) dural defect. Surgery was considered, but deferred in favor of observation and bedrest, given symptom control and no

external cerebrospinal fluid (CSF) leak. A follow-up MRI cervical spine on PID#8 demonstrated that the pseudomeningocele had improved and reduced in size to approximately 4.6 × 3.6 × 3.0 cm. By PID#25, the pseudomeningocele had reduced to only 3.0 × 2.0 × 2.5 cm (Figure 1, panels E–F) and would symptomatically resolve by PID#28. At follow-up on PID#61, it demonstrated substantial size reduction (Figure 2, panels A–B), supporting the effectiveness of conservative management.

Spinal dura lacerations can be classified as simple (linear, <1 cm) or complex (>1 cm or irregular).¹ Dural defects are estimated to occur in up to 11.6% of traumatic spine injuries, most of which involve cord damage.¹ Consequently, given the infrequency of occurrence, a dichotomy of management exists based on extrapolation from incidental durotomy – treat surgically based on intraoperative defect or trial conservative support inferred from CSF leaks presenting postoperatively.^{2,3} Although repair is highly effective intraoperatively, conservative management, deferring surgery, mitigates avoidable risks and limits further stress on the individual. Nonetheless, there exists minimal scientific evidence available to inform this decision in an acute traumatic presentation. This uncertainty was highlighted during the 2025 Canadian Neurological Sciences Federation Congress, where informal polling of neurosurgeons from across the country during the case presentation series revealed a split decision, slightly favoring conservative management, as is presented here. This finding reinforces the lack of consensus and variability in practice across the nation.

Most of the limited literature describing the management of traumatic dural defects relies on single-center retrospective reviews that lack dedicated analysis of conservative management. One study of operatively managed spine injuries compared 33 cases of encountered laceration with no formal repair, and no mention of indirect closure, to 154 instances where direct closure occurred.¹ The non-repaired group was fairly split in terms of simple and complex defects. Repair was forgone due to complexity or because of delayed presentation allowing for tamponade of the CSF leak. Although these patients were subject to surgery for their spine injuries, the absence of dural laceration management draws parallels to a conservative approach. Compared with the repair group, who encountered no postoperative complications, the non-repaired

Corresponding author: Matthew Redmond; Email: mredmond@nosm.ca

Cite this article: Redmond M, Wolf A, and McGregor S. Watch and Wait: Successful Conservative Management for a Traumatic Dural Defect at the Cervicomedullary Junction. *The Canadian Journal of Neurological Sciences*, <https://doi.org/10.1017/cjn.2025.10406>

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Figure 1. T2-Weighted magnetic resonance imaging (MRI) of cervical spine. A: Sagittal view demonstrating spinal cord injury and dural defect; B: coronal view showing cord hemisection; C–D: initial imaging post injury day (PID) #3 revealing pseudomeningocele in sagittal (C) and axial (D) planes; E–F: scans prior to discharge (PID#25) demonstrating reduction in pseudomeningocele in sagittal (E) and axial (F) planes.

group reported 2 infections and a persistent CSF leak.¹ Given uncertainty about whether complications arose from the lack of repair or the operation itself – and that they otherwise recovered well – conservative management may benefit those not already undergoing surgery. Another study, reviewing 18 cases of CSF extravasation secondary to stabbing, in which dural laceration must have occurred, found that surgical intervention was not necessary in most cases – leakage often stopped spontaneously.⁴ Other evidence supporting conservative management comes from individual cases (5,6). One instance describes a simple 0.4 cm defect secondary to penetrating trauma that was managed conservatively with success.⁵

Our case contributes further evidence as to the effectiveness of conservative management while reporting the size of the laceration, which is larger compared to other individual cases (5). Given that

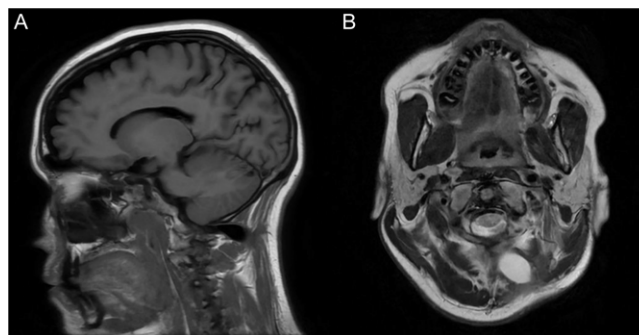


Figure 2. Follow-up magnetic resonance imaging of cervicomedullary junction. A–B: Scans on PID#61 revealing reduction in pseudomeningocele in sagittal T1-weighted (A) and coronal T2-weighted (B) MRI views. Demonstrating symptom resolution and pseudomeningocele improvement, she was discharged to inpatient rehabilitation 43 days post-injury. On PID#61, the patient underwent an MRI for ongoing, nonpositional headaches. The pseudomeningocele was identified and further reduction in size to 2.9 × 1.4 cm was confirmed (Figure 2, panels A–B).

our patient's pseudomeningocele was relatively stable and the dural defect was otherwise simple, a trial of conservative management was deemed favorable. This strategy spared our patient from the avoidable risks of surgery and allowed them to recover absent of any additional complications. Given the success and the option to escalate to surgical intervention if needed, observation and bedrest should be considered as a reasonable first attempt at treatment. Future research is required to investigate the relationship between the size of the traumatic dural defect and outcomes associated with various management strategies.

Author contributions. MR: Drafting the manuscript; AW: conception, revising the manuscript; SM: conception, patient care, and revising the manuscript.

Funding statement. None.

Competing interests. None.

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