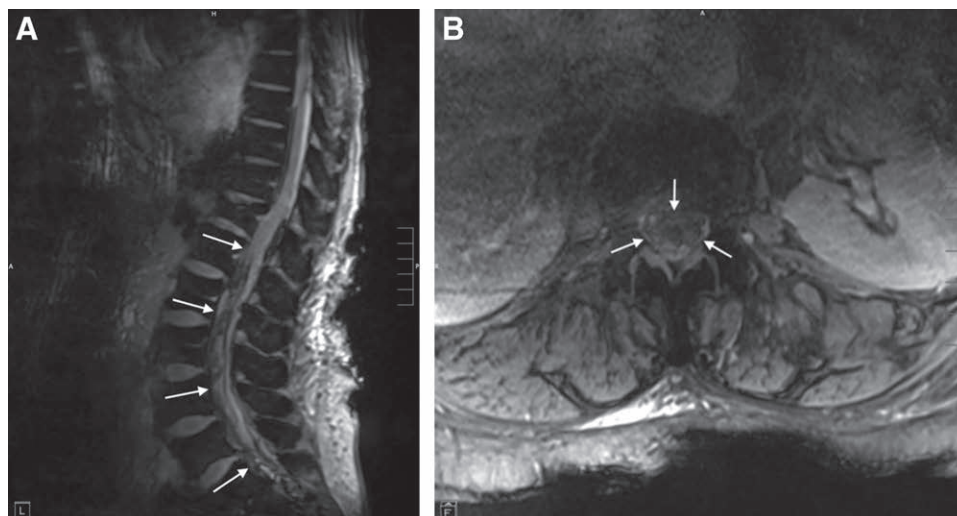


# Bloody Cerebrospinal Fluid Drainage

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The present images were obtained 48 h after thoracic endovascular aortic repair. The T2-weighted sagittal magnetic resonance image of the spine demonstrates a ventral subdural and subarachnoid hemorrhage (*white arrows*) extending from T12–L1 to the termination of the thecal sac at S2 (*panel A*). The axial image at L1 shows (*white arrows*) severe ventral compression of the conus medullaris (*panel B*). Lower extremity paresthesias followed by leg weakness were noted immediately after intended removal of a spinal drain prompting emergent magnetic resonance imaging necessitating surgical evacuation. Notably, 36 h before the first complaint of neurologic symptoms, bloody cerebrospinal fluid (CSF) was noticed in the spinal drain. The patient had normal coagulation status throughout the event.

Bloody CSF is considered benign if it ensues intraoperatively because the likely reason is visceral reperfusion causing reperfusion hyperemia and edema.<sup>1</sup> However, if the CSF was clear at the start of drainage and then became bloody, it may be a sign of intracranial or spinal bleed.<sup>2,3</sup> The risk of hematoma increases when volume drained approaches the upper range of circulating volume (140 to 165 ml per day).<sup>1</sup> Spinal fluid drainage limited to a pressure less than 6 mmHg (~8 cm H<sub>2</sub>O) in open TAAA surgery and less than 8 mmHg (~14 cm H<sub>2</sub>O) in thoracic endovascular aortic repair is associated with low risk of complications.<sup>1</sup>

The following measures are recommended if blood-tinged CSF indicating intracranial or spinal bleed is seen in the postoperative period.<sup>1</sup>

- Discontinue further spinal drainage
- Initiate hourly neuro-examinations

- Correct coagulopathy and hold anticoagulation
- Consider imaging

## Competing Interests

The authors declare no competing interests.

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