

Cervical Hematomyelia after Thoracic Epidural Anesthesia

Sir,

Paraplegia due to spinal cord ischemia [SCI] (injury to the tributaries to the spinal cord) is a rare complication after thoracotomy for aortic or lung surgery. The incidence of SCI after thoracotomy for pulmonary or pleural diseases is estimated at 0.08%. SCI often affects a critical vascular watershed zone lying in between spinal T4 and T9 levels.^[1] SCI follows injury to the upper thoracic intercostal arteries (T3 to T6), the left subclavian or vertebral arteries, which are a source of significant blood supply to the upper spinal cord. Spinal cord hemorrhagic stroke is an even uncommon complication of lumbar puncture or central neuraxial block (CNB) such as epidural anesthesia. Spinal cord hemorrhagic complications include spinal epidural hematoma (sEDH), spinal subdural hematoma (SSH), hematomyelia, and spinal subarachnoid hemorrhage (sSAH).

sEDH is four times more common than SSH, and its incidence is estimated at about 1 per 775,000 spinal blocks, 27 per 1 million epidural blocks, and 1 per 17,800 combined spinal and epidural blocks.^[2] sEDH is a surgical emergency that requires decompressive laminectomy if feasible. Hematomyelia (hematoma within the spinal cord parenchyma) is extremely rare and usually occurs in association with spinal cord surgery, spinal trauma, spinal vascular malformations, coagulopathies, following anticoagulation, spinal cord tumors, myelitis, or syringomyelia.^[3,4]

A 48-year-old man was admitted for a left pneumonectomy for symptomatic cystic bronchiectasis of the left lung. He had no prior history of smoking, diabetes mellitus, bleeding disorders, hypertension, or antiplatelet/anticoagulant use. Routine blood tests and pre-anesthetic bleeding parameters

were within normal limits. The surgery commenced under general anesthesia. Additionally, a thoracic epidural catheter was inserted under strict asepsis for post-operative pain management. He was positioned for surgery in the right lateral position. A left posterolateral thoracotomy was performed, and the thorax entered via the fifth intercostal space, after which the upper pulmonary vein, artery, and bronchus were resected. Due to severe bleeding from the pulmonary artery with one liter of blood loss, volume resuscitation was performed and surgery was aborted after a left lower lobectomy. The incision was closed in layers, and the continuous epidural anesthesia (infusion with 0.125% bupivacaine 2mcg/ml and fentanyl 5ml/h, with the catheter advanced till D5 level) was commenced. On awakening from anesthesia, he complained of weakness and severe pain in both legs with a stabbing pain in the upper back. Neurological examination revealed paraplegia (grade 0/5 power) in both legs, with a complete sensory level at T3 level. Deep tendon reflexes were absent in the legs, and extensor plantar responses were elicited. An emergent MRI spine showed a short segment linear focus of blooming (hemorrhage) within the spinal cord at the C8-T1 vertebral level. Extensive cord edema in the T2 and STIR sequences was noted from the C5 to T8 vertebral levels. Post-contrast spinal MRI did not disclose any spinal vascular malformations [Figure 1]. A neurosurgical opinion was also obtained, and medical management was continued.

The epidural catheter was removed, and he was immediately commenced on IV methylprednisolone 30 mg/kg bolus followed by 5.4 mg/kg for 23 h. By day 25, neurological examination showed grade 3/5 power in the right leg, grade 0/5 in the left leg, a sensory level at T4, and persistent bowel and bladder dysfunction. He was discharged to rehabilitation. At two-month

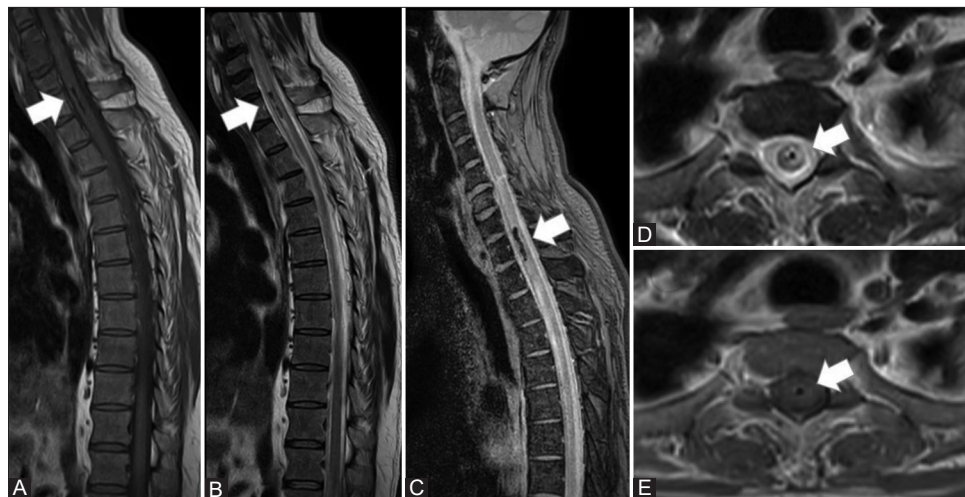


Figure 1: Panel A. Sagittal T1 weighted MRI image of the spinal cord showing a linear hypointensity at the C8-T1 level. Panel B. Sagittal T2 weighted MRI showing a linear hypointensity at C8-T1 level with extensive spinal cord edema. Panel C. STIR sequence sagittal MRI- hypointensity at C8-T1 level. Panel D and E. T2 and T1 weighted axial images showing a central cord lesion with surrounding edema

follow-up, his neurological status remained unchanged. Any post-operative para or quadriplegia should arouse the differential diagnosis of spinal cord ischemia, spinal epidural hematoma, spinal subdural hematoma, or a hematomyelia in the context of neuraxial blockade. A “le coup de poignard rachidien”—an intense stabbing spinal pain (from the French-un coup de poignard: a stab) should alert the clinician to the possibility of spinal SAH or other spinal hemorrhagic complications.^[5]

Hematomyelia after the central neuraxial block is extremely rare. Direct trauma to the spinal cord due to inadvertent direct puncture during epidural anesthesia resulting in hematomyelia has been described.^[6] To the best of our knowledge, hematomyelia distant from the site of epidural puncture has not been reported, although distant epidural hematoma has been reported.^[7] In our patient, the temporal proximity of hematomyelia to the CNB suggested an iatrogenic association. We ruled out contributory factors such as local trauma, coagulopathies, and large spinal vascular malformations. We did not perform spinal angiography to rule out small intramedullary arteriovenous malformations. It is also difficult to disentangle contributory factors such as hemodynamic variations within the spinal cord secondary to the massive intra-operative blood loss or variations in intra-thoracic pressure during surgery. However, we postulate that the epidural infusion might have resulted in increased venous pressure and hematomyelia at a “locus minoris resistentiae” (more vulnerable region).^[4,8]

Physicians should be aware of this extremely rare and devastating complication of CNB. Emergent spinal cord imaging should be performed to assess the type and etiology of spinal cord hemorrhage and plan management.

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Conflicts of interest

There are no conflicts of interest.

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