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Introduction

- Epidural hematoma following cervical epidural steroid injection (CESI) is a rare but devastating complication
- CESI can be caused by vascular injury during injection, concurrent antiplatelet or anticoagulant use, or in the setting of coagulopathy [1]
- Without prompt recognition, permanent neurologic deficits can result
- Management includes urgent imaging coupled with surgical consultation and decompression
- There is growing reports of select patients being managed conservatively [2]

Materials / Methods

- IRB review was not required for case-report per institution policy.

Case Report

- A 67-year-old female with cervical radicular pain and prior C5-7 anterior cervical discectomy and fusion (ACDF) presented for interlaminar CESI.
- Primary attempt at C7/T1 level unsuccessful due to aspiration of heme following loss of resistance, a decision was made to reapproach at T1-2.
- The procedure was successfully completed at this level without any complications. The patient did not complain of any pain, paresthesia, or weakness during or immediately post-procedure. Since heme was aspirated, the patient and their caregiver were counseled and given strict return precautions if any hematoma symptomatology ensue (new limb weakness, pain, paresthesia, or loss or bowel or bladder continence). Emergency contact information was provided upon discharge.
- En route home, the patient experienced worsened neck pain unlike her usual symptoms, ascending weakness, and paresthesia. Patient directed to immediately proceed to the emergency department (ED) for surgical evaluation. Arrival was approximately three hours post procedure and her symptoms were beginning to resolve. MR imaging demonstrated an epidural collection consistent with hematoma spanning the C3-T8 levels, with compression of the spinal cord and most severe at C7-T1.
- The spine surgery team decided to manage the patient conservatively given the rapid resolution of her symptoms. Inpatient observation was two days prior to discharge home, without surgical intervention.

Full Spontaneous Resolution of Acute Quadriparesis from Cervical Epidural Hematoma following Cervical Interlaminar Epidural Steroid Injection



Figure 1. Sagittal T2 MR image of hematoma spanning C3-T8 levels



Figure 2. Sagittal T2 MR image showing with hematoma mass effect on the dorsal cord from the C4-T3 levels, with cord compression most severe at C7-T1. Hematoma thickness up to 8 mm thickness at the T3 level.



Discussion

- Literature supporting non-operative management of epidural hematoma is limited to spontaneous epidural hematomas in patients with mild neurological deficits [3, 4]. Evidence is lacking for this type of care in patients after neuraxial intervention.
- This patient’s symptoms of epidural hematoma were initially severe and disabling. While surgical evacuation is recommended for those with progressive neurological deterioration due to epidural hematoma, this case demonstrates that symptom course can be considered.
- Currently, features that reliably predict which patients might have spontaneous resolution of neurologic deficits after hematoma are undefined. The longer deficits are present, the more likely they will remain permanent [5].
- Journal of Clinical Neuroscience advise using Paralysis Recovery Start Time “PRST” as a tool to guide management with 6 hours being the cutoff to surgical intervention if no signs of recovery. [6].
- Consultation with a spine surgeon the moment an epidural hematoma is suspected is recommended based on existing knowledge.

References

[1] Schneider BJ, Maybin S, Sturos E. Safety and Complications of Cervical Epidural Steroid Injections. *Phys Med Rehabil Clin N Am*. 2018 Feb;29(1):155-169. doi: 10.1016/j.pmr.2017.08.012. Epub 2017 Oct 7. PMID: 29173660.

[2] Groen RJ. Non-operative treatment of spontaneous spinal epidural hematomas: a review of the literature and a comparison with operative cases. *Acta Neurochir (Wien)*. 2004 Feb;146(2):103-10. doi: 10.1007/s00701-003-0160-9. Epub 2003 Dec 5. PMID: 14963742.

[3] Dziedzic, Tomasz, et al. “Management and Neurological Outcome of Spontaneous Spinal Epidural Hematoma.” *Journal of Clinical Neuroscience*, vol. 22, no. 4, 2015, pp. 726–29, <https://doi.org/10.1016/j.jocn.2014.11.010>.

[4] Wang, Mengmeng, et al. “Clinical Features, Management, and Prognostic Factors of Spontaneous Epidural Spinal Hematoma: Analysis of 24 Cases.” *World Neurosurgery*, vol. 102, 2017, pp. 360–69, <https://doi.org/10.1016/j.wneu.2017.02.058>.

[5] Mukerji N, Todd N. Spinal epidural haematoma; factors influencing outcome. *British Journal of Neurosurgery*. 2013;27(6):712-717. doi: [10.3109/02688697.2013.793289](https://doi.org/10.3109/02688697.2013.793289)

[6] Musha Y, Kinjo S, Ishimine Y, Takesue Y, Sakamoto T, Ito K. Therapeutic strategy for acute spinal cord paralysis by epidural hematoma derived from the application of non-operative observation and the optimal timing to convert to surgical intervention. *J Clin Neurosci*. 2021 Apr;86:242-246. doi: 10.1016/j.jocn.2021.01.029. Epub 2021 Feb 12. PMID: 33775335