

BACKGROUND

- Spinal cord stimulation (SCS) effectively treats chronic pain syndromes but can cause complications like infection, epidural hemorrhage, cerebrospinal fluid leakage, and rarely, cranial nerve palsies. [1]. While an epidural blood patch (EBP) is a standard treatment for post-dural puncture headache (PDPH) within 24 hours, its effectiveness for iatrogenic abducens nerve palsy is limited and controversial. [2].

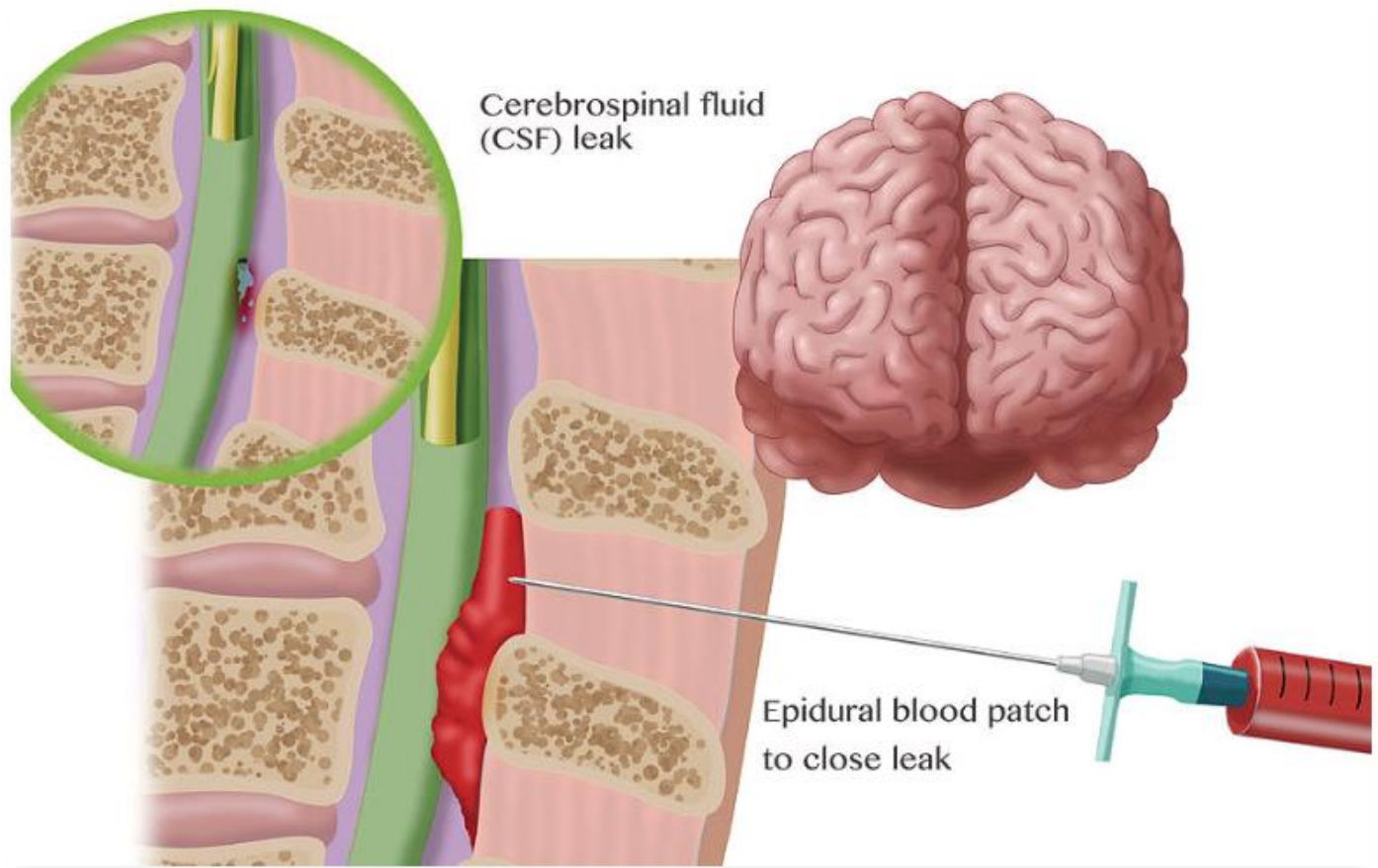


Figure 1: Example image of an epidural blood patch closing a CSF leak [6]

PURPOSE

- The overall is to report a case of unilateral sixth nerve palsy as a potentially rare complication associated with cervical SCS insertion, which was successfully treated with an EBP 3-days after symptom onset.

CASE DESCRIPTION

- Presentation:** A 44-year old patient with a history of motor vehicle collision, and persistent lumbar radiculopathy despite microdiscectomy and lumbar SCS implantation, presented with chronic neck radiculopathy unresponsive to multiple medications, therapies, and a C3-4 anterior disc replacement.
- Procedure:** The patient underwent a cervical SCS trial where 14-guage dual-lead electrodes were fluoroscopically placed via paramedian approach at the T1-T2 interspace posteriorly up to the C1-C2 levels.
- Complication:** On post-operative day 3, the patient developed severe right shoulder and arm pain, dizziness, and headaches indicative of a dural puncture CSF leak, leading to lead removal. By day 6, symptoms worsened to diplopia, resulting in emergency room admission and diagnosis of right lateral gaze and abducens nerve palsy.

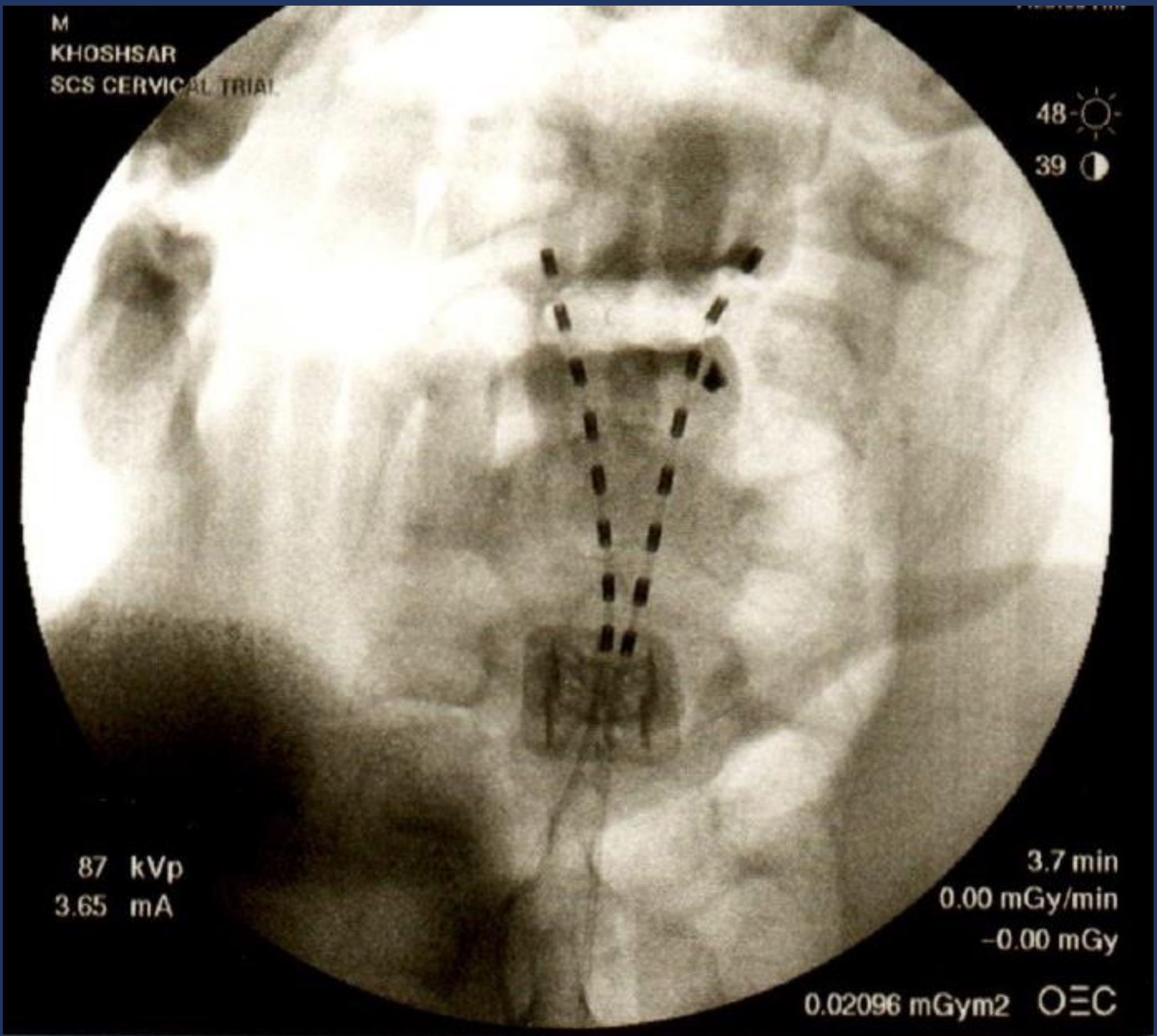


Figure 1: Fluoroscopic image of cervical spinal cord stimulation trial with dual leads entering at the T1-T2 interspace moving posteriorly up to the C1-C2 levels.

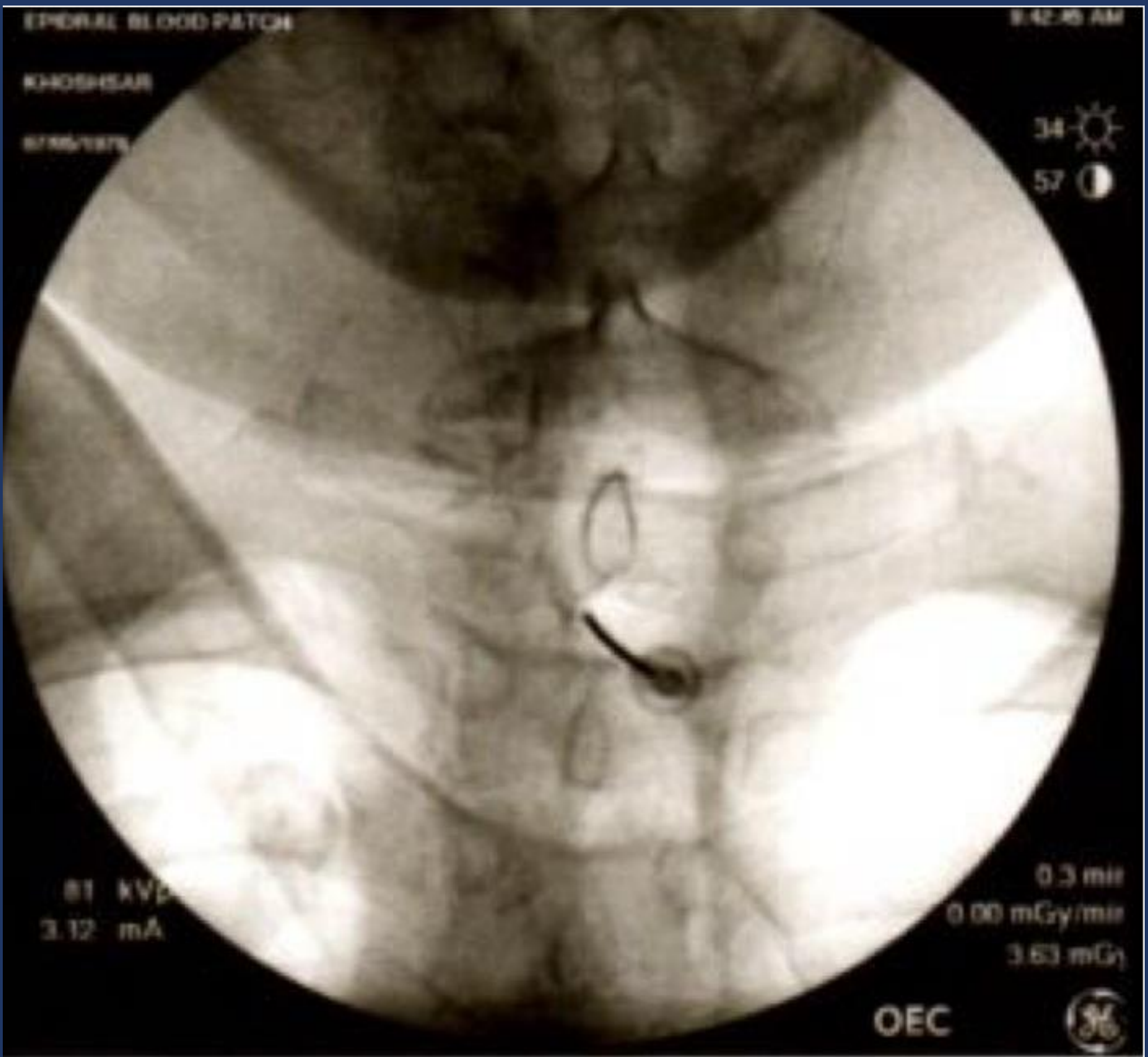


Figure 2: Fluoroscopic image of successful placement of epidural blood patch through the T1-T2 interspace

RESULTS

- A cervical epidural blood patch (EBP) provided substantial pain relief.
- The patient was discharged with an eye patch and later underwent a brain MRI, which showed no significant pathology.
- At the two-month follow-up, the patient reported a 70% reduction in double vision and full resolution of eye movements.

DISCUSSION

- A review of cases between 1930 and 2015 analyzing cranial nerve palsies after spinal punctures revealed the abducens nerve was the most involved (92.1%), particularly in the right eye, as seen in this patient [3].
- The transient abducens palsy likely resulted from a dural tear during cervical SCS implantation and removal, causing CSF leakage, intracranial hypotension, and a caudal brainstem shift that traumatized the sixth cranial nerve [4].
- An EBP involves injecting a small volume of autologous blood into the epidural space to seal a CSF leak [5].
- In this case, near resolution of oculomotor function was observed after an EBP was performed more than 72 hours post-onset.

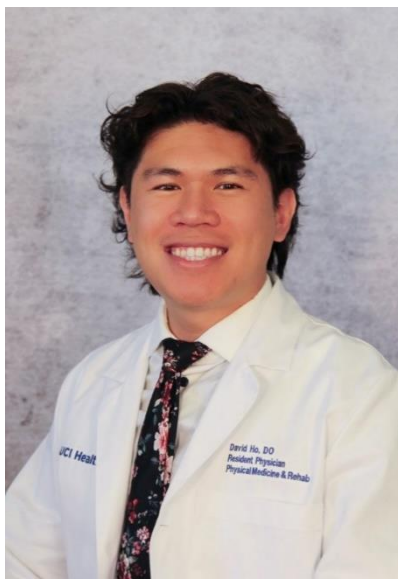
CONCLUSION

- Spinal cord stimulation can lead to rare complications like abducens nerve palsy, which may be successfully treated with an epidural blood patch even when performed several days after symptom onset.

REFERENCES

- Cameron T. Safety and efficacy of spinal cord stimulation for the treatment of chronic pain: a 20-year literature review. J Neurosurg. 2004;100(3 Suppl Spine):254-267. doi:10.3171/spi.2004.100.3.0254
- Béchar P, Perron G, Larochelle D, Lacroix M, Labourdette A, Dolbec P. Case report: Epidural blood patch in the treatment of abducens palsy after a dural puncture. Can J Anesth Can Anesth. 2007;54(2):146-150. doi:10.1007/BF03022012
- del-Rio-Vellosillo M, Garcia-Medina JJ, Pinazo-Duran MD, Abengochea-Cotaina A, Barbera-Alacreu M. Ocular Motor Palsy After Spinal Puncture: Reg Anesth Pain Med. 2017;42(1):1-9. doi:10.1097/AAP.0000000000000504
- Fairclough WA. Sixth-nerve Paralysis after Spinal Analgesia. BMJ. 1945;2(4431):801-803. doi:10.1136/bmj.2.4431.801
- Tubben RE, Jain S, Murphy PB. Epidural Blood Patch. In: StatPearls. StatPearls Publishing; 2024. Accessed June 10, 2024. <http://www.ncbi.nlm.nih.gov/books/NBK482336/>
- Schroeder M. Epidural Blood Patch Procedure #1. Fine Art America. Published 2019. Accessed September 18, 2024. <https://fineartamerica.com/featured/1-epidural-blood-patch-procedure-monica-schroeder.html>

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