ABSTRACT
Introduction: Injury to the dural membrane during spinal surgery may result in persistent cerebrospinal fluid (CSF) leak. Prompt management to stop this CSF leak is warranted to avoid serious neurological consequences. Many surgical and nonsurgical interventional techniques including epidural blood patch have been advocated. We present a case report where transfemoral epidural blood patch was used successfully to manage persistent CSF leak after laminectomy.

Keywords: Contrastalateral, CSF leak, Epidural blood patch, Laminectomy, Spinal headache, Transforaminal.


INTRODUCTION
Unintentional dural injury is a known complication of spinal surgery with reported incidence of 1 to 17%.1 Dural tears and cerebrospinal fluid (CSF) leaks are serious as they may result in meningitis, CSF fistulas, and pseudocyst formation with potential nerve compression.1,2 Therefore, prompt management either by sealant or by repeat surgery is recommended to prevent the complications of CSF leak. Large dural rent may require surgical repair; however, surgery is often difficult and may result in failure (5–10%).3 Various natural and synthetic dural sealant systems have been used as nonsurgical alternatives. We present a case of persistent CSF leak that was treated successfully with autologous epidural blood patch through transfemoral approach.

CASE REPORT
A 58-year-old male was suffering from chronic backache with radicular symptoms of the right lower limb. Magnetic resonance imaging (MRI) showed prolapsed intervertebral disk with large extruded disk at L3/L4 level for which right-sided hemi-laminectomy was done at L3/L4 disk level in October 2014. After 1 year, he again developed back pain with similar radicular symptoms in the right lower limb. Repeat MRI showed recurrence of disk prolapse with adhesions in the previously operated area. Diagnosis of failed back surgery syndrome was made, and he was referred to our pain clinic. Right transfemoral epidural injection at L4 level was given with 2.0 mL 1% lidocaine mixed with 80 mg Depomedrol®. After an initial improvement for 6 weeks, he complained of progressive numbness and surgery was advised. A complete laminectomy at L3/L4 with removal of disk material was done. During adhesiolysis, dura was injured, which was repaired during surgery without any apparent CSF leak. On the 3rd postoperative day, dressing was noticed soaked in serosanguinous fluid. Cerebrospinal fluid leak was suspected, and patient was advised to take strict bed rest with broad-spectrum intravenous (IV) antibiotics, tablet. Acetazolamide (to reduce CSF formation), and pressure dressing of surgical wound. Cerebrospinal fluid leak persisted despite the above measures even after 7 days, and the patient developed severe postural headache (typical postdural puncture headache, PDPH), giddiness, and neck pain which did not respond to analgesics and muscle relaxants (paracetamol, tramadol, and thiocolchicoside). Hence, an epidural blood patch was advised. An informed consent was taken, and the procedure was explained. After IV access and noninvasive monitors were attached, the patient was placed in the prone position with a pillow under his abdomen; an entry for epidural injection was planned at the right L4 intervertebral foramen. However, severe inflammation and excoriation with loss of epidermis was noticed on the right wound margin. Therefore, left L4 foraminal entry was decided. Under fluoroscopic guidance, an 18-G Tuohy needle was inserted in the left L4 foramen using three-dimensional (direction–depth–direction) principle. An epidural catheter was inserted through needle. Correct position of needle and catheter was confirmed with injection of 1 mL Omnipaque-300® (Figs 1A to C). Using sterile technique, 10 mL blood was withdrawn from patient and was injected slowly through epidural catheter (Fig. 1D). During injection,
Postoperative Cerebrospinal Fluid Leak managed with Transforaminal Epidural Blood Patch

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Figs 1A to D: (A) Left oblique fluoroscopic view showing needle entry point at left L4 foramen; (B) left oblique fluoroscopic view showing 18-G Tuohy needle in left L4 foramen; (C) anteroposterior view showing position of epidural needle, epidural catheter, and contrast spread in epidural space; and (D) injection of autologous blood in epidural space through epidural catheter

vitals were monitored and when patient started feeling some pressure in the back (after 8 mL of blood), injection was stopped. Postprocedure catheter was left in place, and patient was shifted to the ward. Bed rest in supine position for 2 hours was advised. Patient was examined in next morning and found symptom free with no further CSF leak. Epidural catheter was removed after 2 days, and patient was discharged. After 2 months’ follow-up, patient is symptom free and resumed his duties.

DISCUSSION

Dural injury during spinal surgery is a known complication (incidence 1–17%), and 0–3% of such cases may result in persistent CSF leak or cutaneous CSF fistula. Surgical repair is a preferred choice particularly if identified during surgery. However, failure may occur in 5 to 10% of the cases. Epidural blood patch through interlaminar and transforaminal approaches has been used to treat both spontaneous cerebral hypotension and PDPH after transforaminal injection. However, the present case had unique challenges. An interlaminar approach was not possible due to recent surgery, and site-targeted single injection was not possible due to skin condition on the operated site. Therefore, transforaminal approach from the contralateral side was chosen and epidural catheter was left in situ for a repeat injection of blood if required. The amount and dosages of blood being used to give epidural blood patch are variable (2–30 mL). However, use of 8 mL volume of blood in the present case was based on our clinical judgment, i.e., patient complaining of fullness of back. We have been using this parameter to decide epidural blood volume for PDPH treatment and have found it relevant and successful in the present case as well. Moreover, larger volume or repeat injection of autologous blood have potential risk of subdural hematoma, arachnoiditis, or permanent paraparesis. This case report presents an innovative approach to manage persistent CSF leak after laminectomy. Surprisingly, epidural blood patch through contralateral transforaminal approach to treat iatrogenic dural tear with persistent CSF leak has not been reported in literature.

CONCLUSION

A persistent CSF leak and associated PDPH after spine surgery was treated successfully by epidural blood patch through contralateral transforaminal approach using epidural catheter.
REFERENCES