



Case Report

Two cases of supratentorial lobar intracranial hemorrhage following lumbar decompression and stabilization

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Received : 15 March 2021

Accepted : 07 April 2021

Published : 10 May 2021

DOI

10.25259/SNI_271_2021

Quick Response Code:



ABSTRACT

Background: Lumbar spine surgery with or without intraoperative dural tear (DT) may contribute to postoperative subdural hematomas and/or cerebellar intracranial hemorrhages (ICHs). Here, we present two patients, one with and one without an intraoperative DT occurring during lumbar surgery, both of whom developed acute postoperative supratentorial ICHs.

Case Description: Two patients developed supratentorial lobar ICH following lumbar decompressions and fusion. The first patient, without an intraoperative DT, developed multiple ICHs involving the left cerebellum and left temporal lobe. The second patient, following an L4-5 decompression/instrumented fusion involving a DT, postoperatively developed a large right frontal ICH.

Conclusion: Here, two patients undergoing lumbar spine surgery with/without DT subsequently developed significant ICH.

Keywords: Cerebrospinal fluid leak, Durotomy, Intracranial hemorrhage, Lobar hemorrhage, Lumbar surgery, Spine

INTRODUCTION

Intracranial hemorrhage (ICH) rarely occurs following lumbar spine surgery with/without intraoperative dural tears (DTs). These ICHs are more frequently attributed to intracranial hypotension following an intraoperative durotomy (i.e., DT or cerebrospinal fluid [CSF] leak), and result in cerebellar hemorrhages, subdural hematomas/hygromas, and subarachnoid hemorrhages.^[1,3,4] Here, we present two patients undergoing lumbar surgery with/without accompanying intraoperative DT, both of whom developed large postoperative supratentorial ICHs.

CASE PRESENTATION

Patient 1

A 72-year-old female presented with sciatica and neurogenic claudication. The lumbar MRI demonstrated significant L4-L5 central/bilateral neuroforaminal stenosis with Grade 1 spondylolisthesis [Figure 1a]. She underwent a L4-5 laminectomy with fusion. No DT occurred

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during the operation. On postoperative day 2, she reported nausea, emesis, and fatigue, but was neurologically intact. However, on postoperative day 3, after an unwitnessed fall, she became disoriented and developed left eye ptosis. A brain CT demonstrated a large left temporal ICH and a large left cerebellar hemorrhage with accompanying obstructive hydrocephalus [Figure 1b]. She underwent a suboccipital craniectomy for cerebellar clot evacuation, a left-sided decompressive hemicraniectomy for temporal clot evacuation, and eventual ventriculoperitoneal shunt placement. The postoperative lumbar MRI never showed a CSF leak. At 4-month follow-up, the patient was awake, alert, and following commands symmetrically, but remains aphasic.

Patient 2

A 61-year-old female presented with recurrent bilateral leg pain 1 year following an initial L3-5 laminectomy. The lumbar MRI now showed new right L3-4 foraminal stenosis with Grade I spondylolisthesis at the L4-L5 level [Figure 2a]. She underwent a secondary L4-5 decompression/posterior fusion. An intraoperative DT was observed, which was repaired with a braided nylon suture, muscle patch graft, and hydrogel dural sealant, followed by placement of lumbar subarachnoid drain. Postoperatively, the patient awakened with a new left hemiparesis. A postoperative brain CT demonstrated a 17 cc right frontal ICH [Figure 2b], which was managed conservatively. Nine months later, the patient exhibited a residual left-sided hemiparesis and left facial droop with mild dysarthria which were improving.

DISCUSSION

The most common intracranial complications reported following spine surgery involving intraoperative traumatic DT include intracranial hypotension, subdural hematomas, and cerebellar ICH. These occur secondary to caudal displacement of the brain with brain sag, which leads to

tearing or compression of cortical veins and dural sinuses resulting in venous infarction and hemorrhage formation.^[1,4]

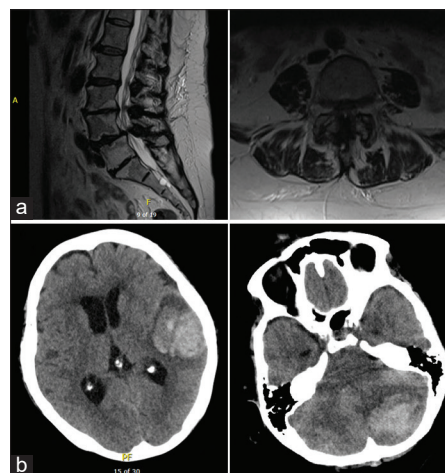


Figure 1: (a) T2-weighted MRI lumbar spine sagittal and axial views demonstrating severe central lumbar stenosis at L4/5, with Grade 1 anterolisthesis of L4 on L5. (b) left temporal and left cerebellar intraparenchymal hematomas with obstructive hydrocephalus, noted on postoperative day 3.

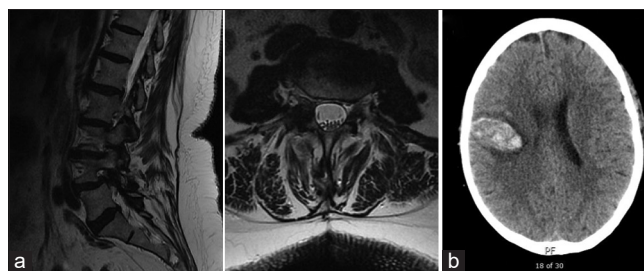


Figure 2: (a) T2-weighted MRI lumbar spine sagittal and axial views demonstrating right L3-4 foraminal stenosis and Grade I anterolisthesis of L4 on L5. (b) right frontal intraparenchymal hematoma noted on immediate postoperative CTH.

Table 1: References to prior reported supratentorial intraparenchymal hemorrhages following CSF leak.

Patient	Reference	Age, gender	Location	Deficit	Outcome
1	Hempelmann and Mater (2012). <i>Eur Spine J</i> ^[2]	69, F	Left temporo-occipital lobe	Headache, nausea	Full recovery
2	Hempelmann and Mater (2012). <i>Eur Spine J</i> ^[2]	62, F	Bilateral parieto-occipital lobes	Headache, confusion	Full recovery
3	Kaloostian <i>et al.</i> (2013). <i>J Neurosurg Spine</i> ^[3]	61, F	Right temporal, parietal	Motor seizure	Mild cognitive delay
4	Morandi <i>et al.</i> (2001). <i>J Neurosurg Spine</i> ^[5]	34, M	Left temporal	Dysarthria	Full recovery
5	Thomas (Phila Pa 1976) (2002). <i>Spine</i> ^[6]	38, F	Bilateral temporal	Positional headache, nausea	Full recovery
6	You <i>et al.</i> (2012). <i>J Korean Neurosurg Soc</i> ^[7]	63, M	Right temporal	Headache	Full recovery

CSF: Cerebrospinal fluid

However, these complications can also occur following lumbar surgery without DT. For instance, one study showed that out of eight patients who sustained ICHs after spine surgery, 13% of patients had no CSF leak (1 of 8 patients).^[3] Other series showed no CSF leak in approximately 9% of patients (3 of 33 patients) with ICH after spine surgery.^[3] Notably, we observed no CSF leak intra- or postoperatively in Case 1.

Most reports describe cerebellar ICH or subdural hematoma following lumbar spinal surgery with DT, but few report supratentorial lobar ICH. There are six previously reported cases of supratentorial intraparenchymal hemorrhage following spine surgery, all of which involved significant CSF leak intraoperatively.^[2,3,5-7] Unlike our experience, however, all previously reported cases involved only minor neurological symptoms, with small intracranial ICH volumes (generally <10 mL), and involved full or near-full neurological recoveries [Table 1].

CONCLUSION

Here, we have presented two patients undergoing lumbar surgery with/without intraoperative DT that resulted in postoperative large ICHs.

Declaration of patient consent

Patient's consent not required as patients identity is not disclosed or compromised.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

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How to cite this article: Kashkoush A, Chakravarthy V, Bain M, Kalfas I, Steinmetz M. Two cases of supratentorial lobar intracranial hemorrhage following lumbar decompression and stabilization. *Surg Neurol Int* 2021;12:221.