Symptomatic epidural haematoma after cervical laminoplasty: a report of three cases

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ABSTRACT

Symptomatic epidural haematoma after cervical laminoplasty is rare. We report 3 patients who required emergency evacuation of an epidural haematoma. Timely diagnosis and removal of the haematoma is important to prevent neurological deficits. The causative factors in these patients were preoperative coagulopathy, hypertension, and the malfunction of a closed-suction drain.

Key words: hematoma, epidural, spinal; laminoplasty

INTRODUCTION

The incidence of symptomatic epidural haematoma after spinal surgery has been reported to be <3%. Its risk factors include hypertension, multilevel procedures, drinking >10 units of alcohol a week, and postoperative use of non-steroidal anti-inflammatory drugs. In our hospital between 2007 and 2013, 243 cases of cervical laminoplasty and/or laminectomy were performed, in which the spinous process was split using a T-saw and the posterior arch was reconstructed using hydroxyapatite spacers. Three (1.2%) patients required emergency evacuation of symptomatic epidural haematoma. Timely diagnosis and removal of the haematoma is important to prevent neurological deficits.

CASE REPORTS

Patient 1

In April 2005, a 64-year-old man presented with cervical myelopathy (Fig. 1). He had hypertension and atrial fibrillation and was taking warfarin. At the age of 45 years, he had undergone anterior spinal decompression and fusion of C5/6 for a disc herniation. Warfarin was stopped one week before cervical laminoplasty of C3-6. The operating time was 125 minutes, and intra-operative blood loss was 30 ml. A closed-suction drain was placed at the lateral gutter of the left side. After 4 hours, the
patient developed sensory disturbance and muscle weakness in the left leg. Blood was observed on the wound dressing, indicating inadequate drainage. At 8 hours, the wound drain had collected 160 ml blood. An epidural haematoma was noted at C6-T1. At 10 hours, revision surgery was performed to remove the epidural haematoma located focally at C6-T7. No active bleeding or blockage of the drainage tube was noted. Neurological function recovered immediately after revision surgery. At one year, the spinal cord was sufficiently enlarged.

Patient 2
In January 2008, a 77-year-old man presented with cervical myelopathy and a facet cyst at C6/7 (Fig. 2). He had hypertension and a history of pancreatic cancer, for which he had undergone resection with no recurrence. Anticoagulant therapy was not performed before C3-6 laminoplasty and C7 laminctomy. The operating time was 193 minutes, and intra-operative blood loss was 110 ml. A closed-suction drain was placed at the lateral gutter of the left side. After 18 hours, the patient's neck and the area surrounding the wound were swollen and oedematous. At 21 hours, paraplegia developed due to an epidural haematoma. The amount of blood collected was 200 ml (10 ml/hour). At 25 hours, revision surgery was performed to remove a large blood clot. No active bleeding or drainage tube malfunction was noted. The sensory disturbance resolved immediately after revision surgery. At the next day, the spinal cord and dural sac were expanded thoroughly. At one year, the patient's condition was satisfactory.

Patient 3
In October 2008, a 60-year-old man presented with cervical myelopathy and associated severe compression (Fig. 3). He was taking medication for hypertension and depression. Anticoagulant therapy was not performed before cervical laminoplasty of C3-6. The operating time was 129 minutes, and intra-operative blood loss was 30 ml. A closed-suction drain was placed at the lateral gutter of the left side. After 2 hours, the patient developed incomplete quadriplegia. At 3 hours, an epidural haematoma was noted. A total of 110 ml of blood was collected (37 ml/hour). At 4 hours, revision surgery was performed to remove the epidural haematoma around the epidural space. No bleeding vessels or failure of the drainage tube was noted. At 2 weeks, the haematoma of the epidural space had disappeared, and neurological deficits had recovered to the preoperative level. At 2 months, recovery was satisfactory.

DISCUSSION
Risk factors for developing symptomatic epidural

![Figure 1](image_url)
Symptomatic epidural haematoma after cervical laminoplasty

haematoma include preoperative factors (drinking >10 units of alcohol a week, previous spinal surgery, anticoagulant therapy, and hypertension), intra-operative factors (multilevel procedures, surgery on the thoracic spine, and large intra-operative blood loss), and postoperative factors (use of non-steroidal anti-inflammatory drugs and malfunction of the closed-suction drain).

In our series, only patient 1 had previous spinal surgery and was prescribed anticoagulant therapy, but all 3 were prescribed antihypertensive medication. Patients 2 and 3 had especially high systolic blood pressure of 160 to 180 mmHg for 2 to 3 hours after surgery. Blood pressure was raised before wound closure to ensure adequate haemostasis. It is necessary to closely monitor the patient’s blood pressure postoperatively. Cervical laminoplasty usually involves 5 to 6 levels. In patients 1 and 2, the operated level included T1. Intra-operative blood loss was not large in any of the patients. Non-steroidal anti-inflammatory drugs are routinely used for pain control. More research is needed to understand the exact causes and preventive measures for these complications.
necessary to determine whether their prescription
results in epidural haematoma. It remains
controversial whether the use of a drain results in
epidural haematoma. In one study, all patients
who underwent evacuation surgery for subdural
haematoma had no suction drain. In patients 1 and
2, malfunction of the suction drain was a risk factor,
because a large amount of blood was seen around
the wound rather than in the suction drain. Special
attention should be paid to the amount of bleeding
around the wound and on the dressing. If copious
bleeding is evident despite the use of a suction drain,
an epidural haematoma must be considered. Timely
diagnosis and removal is important to prevent
neurological deficits.

CONCLUSION
Spinal surgeons must be aware of the risk of epidural
haematoma following cervical laminoplasty. Timely
diagnosis and removal of the haematoma is important
to prevent neurological deficits.

DISCLOSURE
No conflicts of interest were declared by the authors.

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