Postoperative Extradural Hematoma After Removal of a Subgaleal Drainage Catheter
—Case Report—

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Abstract

A 29-year-old man developed a delayed postoperative extradural hematoma after the craniotomy to treat recurrent malignant glioma and hydrocephalus. The patient became alert on the day after the operation. Computed tomography (CT) 12 hours after the operation showed no intracranial hematoma and the subgaleal drainage catheter was removed 18 hours after the operation. The patient complained of headache and went into a coma 2 hours after removal of the drain. CT demonstrated massive acute extradural hematoma with marked midline shift. Emergency craniotomy revealed that the source of the hematoma was an injured scalp artery along the route of the drainage catheter. He died of acute brain edema 9 days later. Hemostasis should be confirmed at insertion and removal of the drainage catheter.

Key words: acute extradural hematoma, postoperative complication, subgaleal drain, ventriculoperitoneal shunt

Introduction

Extradural hematoma was one of the most common complications after intracranial operations until the early 20th century. The development of hemostasis methods such as Horsley’s wax, electrocautery, and dural tenting sutures, and perioperative management of fluid balance, blood pressure, and anesthesia have reduced hemorrhagic complications after intracranial operations. The incidence of postoperative extradural hematomas was five in 400 craniotomies (1.3%), and 10 of 1055 intracranial operations (0.9%). The causes of postoperative extradural hematoma include incomplete hemostasis of the dura mater or bone, incomplete central stay sutures of the bone flap, systemic hypertension in the perioperative period, and postoperative hypofibrinogenemia for regional hematoma, and dural separation from the bone with incomplete hemostasis of the separated dura and abrupt lowering of intracranial pressure due to cerebrospinal fluid aspiration resulting in brain collapse for adjacent hematoma. Ventricular dilation and ventricular shunting were thought to be the cause of distant extradural hematoma.

We describe a case of iatrogenic acute extradural hematoma after removal of a subgaleal drainage catheter.

Case Report

A 29-year-old man was admitted after sudden onset of unconsciousness. Computed tomography (CT) demonstrated a huge hemorrhage in the right temporal lobe. An emergency operation was performed, and histological examination revealed a malignant glioma and intratumoral hematoma. After 6 months, local recurrence of the tumor and hydrocephalus occurred, so the recurrent tumor was removed and a ventriculoperitoneal shunt was implanted. The day after the operation, the patient became alert. CT 12 hours after the operation showed no intracranial hematoma (Fig. 1), so the subgaleal drainage catheter was removed 18 hours after the operation. The skin hole for the drainage catheter was closed with a surgical stapler.

The patient complained of headache after removal of the drain. The patient developed tachycardia (140/min), high-grade fever (40.2°C), and hypertension (180/90 mmHg), and went into a coma 2 hours after the removal of the drain. CT demonstrated...
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massive acute extradural hematoma with marked midline shift (Fig. 2). Emergency craniotomy revealed that a parietal branch of the superficial temporal artery was injured on the route of the drainage catheter (Fig. 3). The patient died of acute brain edema (Fig. 4) 9 days later.

Discussion

In the present case of extradural hematoma, the origin of the bleeding was the injured artery of the scalp along the track of the catheter. The parietal branch of the superficial temporal artery had been injured by the insertion of the catheter. The injured artery was compressed by the catheter, and the bleeding was temporarily stopped until the catheter was removed. The skin hole was closed after removal of the drain, so the hematoma passed into the extradural space through the gap in the bone flap and entered the region adjacent to the former craniotomy despite the dural tenting suture. The ventricular shunting assisted the rapid and fatal growth of the extradural hematoma.

Only three cases of iatrogenic acute intracranial hematoma associated with removal of a drainage catheter have been reported.1) Two cases involved burr hole drainage of chronic subdural hematoma during which a drainage catheter was placed in the subdural space. The subdural membrane was damaged when the catheter was removed, and acute subdural hematoma occurred. The other case involved craniotomy for a brain abscess in which a suction drainage tube was placed in the subgaleal space. After removal of the subgaleal catheter, acute subdural hematoma developed. The origin of the bleeding was the scalp along the track of the catheter, as in our case.

Catheters for drainage are commonly placed in
the subgaleal, extradural, or subdural spaces during neurosurgical operations to prevent accumulation of the fluid or hematoma. However, neurosurgeons must consider the risk of serious bleeding complication directly related to the drain. Such bleeding complication is extremely rare but may be fatal, so hemostasis should be confirmed at insertion and removal of the drainage catheter.

References


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