Coexistence of subdural and intracerebral hematoma in a shunted infant not related to ventricular catheter

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**Case Report.** A 5-day-old male was admitted to our clinic when his mother noticed that his head circumference had increased. On examination, he was irritable, the anterior fontanelle was tense and the head circumference was 43 cm. A CT of the head showed dilatation of the lateral and third ventricles (Figure 1). He underwent a right-sided ventriculoperitoneal shunt catheter insertion for hydrocephalus. The follow up CT performed 2 days postoperatively showed the significant decrease in size of the lateral ventricles (Figure 2). Shunt catheter was in the atrium of the left occipital horn. At the sixth postoperative day, we noticed the excessive collapse of the anterior fontanelle, and performed urgent CT. A cranial CT scan showed a left sided posterior fossa subdural hematoma measuring 0.8 x 0.8 x 0.9 cm, left temporoparietooccipital laminar subdural hematoma, and left temporooccipital intracerebral hematoma measuring 1.5 x 1.5 x 1 cm (Figure 3). Hematological findings and bleeding tests were all normal. He was treated nonsurgically as he was asymptomatic. He was discharged from hospital in a stable condition on the twelfth postoperative day.

**Discussion.** Intracerebral and subdural hematomas distantly from the site of insertion of a ventriculoperitoneal shunt are extremely rare complications. Though these conditions have been reported previously, we could not find a report of a combination of them in any patient in the literature to date. Their etiology is thought to be due to an overdrainage of CSF and a rapid lowering of intracranial pressure, leading to the development of these hematomas. In the present case, the putative pathophysiological mechanism that led to hematomas point to an excessive CSF drainage in a reduction of CSF volume with the associated lowering in intracranial pressure, which eventually increased the transmural pressure gradient of the vessels, leading to a secondary wall stress rupture. Since the advent of modern neuroimaging techniques, prompt diagnosis of post shunting intracranial hematoma has been possible even in asymptomatic patients. The choice between operative or nonoperative management of post shunting...
intracranial hematoma is a difficult and controversial issue, especially in asymptomatic patients. The decision for operative or nonoperative treatment is based on the patient's clinical picture, age, CT findings including its mass effect, size, and stage of hematoma. Neurological deterioration over time is also an important factor influencing the decision to operate. Surgical evacuation of the hematoma is not often necessary. We treated our patient nonoperatively as he was asymptomatic. If neurological deterioration had begun, we would have carried out prompt surgical intervention. To prevent the formation of intracranial hematomas after ventricular shunting, the usual precautions of minimal CSF loss at the time of ventricular catheter insertion, use of high-pressure valves or antisiphon valves and slow return to full upright position in the immediate postoperative period are necessary.

In conclusion, CSF overdrainage can either cause or precipitate intracranial hematomas affecting both the infratentorial and supratentorial regions. The choice between operative or nonoperative management of post-shunting intracranial hematoma should be based on each patient's clinical presentation.

References


