

Intraoperative contralateral extradural hematoma developing during evacuation of a traumatic contusion

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Abstract

We present a case of severe head injury who developed contralateral extradural hematoma during evacuation of contused brain. The lesion was suspected due to sudden brain swelling at the site of surgery and was confirmed by computed tomography and was evacuated in emergency.

ABBREVIATIONS

EDH : extradural hematoma; SDH: subdural hematoma; CT: computed tomography; GCS: Glasgow coma score

INTRODUCTION

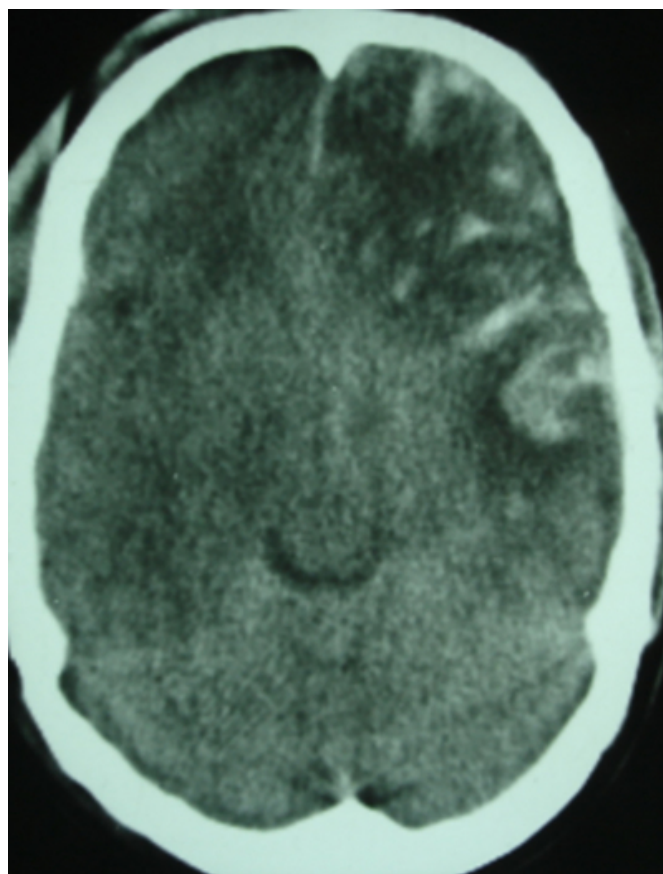
Development of acute brain swelling during evacuation of traumatic brain lesion is a serious complication in neurosurgery. The occurrence of peroperative contralateral extradural hemorrhage during operation for evacuation of contusion is rare, hence, being reported.

CASE REPORT

A 23 year old male sustained head injury due to collision of his motor-bike with a car. He was unconscious right from the time of the injury. There was no history of bleeding from ear, nose or throat. At admission, his BP was 100/86 mm Hg and pulse 68/min. His Glasgow Coma Score (GCS) was E1V1M5. Both pupils were 2 mm and reactive to light. He was moving all the limbs. Computed tomography (CT) of the head revealed left frontotemporal contusion with midline displaced to the right (Figure 1). Surgical evacuation of the contused brain was done in emergency.

Figure 1

Figure 1: showing left frontal contusion with midline shift



Brain bulged out through the craniotomy site. Dura was left open and bone flap was placed in the abdominal wall. He was given antibiotics, mannitol, frusemide and phenytoin. Repeat CT scan of the head revealed a large contralateral frontal extradural hematoma (EDH) with 2.3 cm midline shift (figure 2). The patient was wheeled back to operation

theatre and the EDH was evacuated. Postoperatively, he was kept on ventilatory support and tracheostomy was done. His GCS was E2VtM4. Post operative CT scan revealed complete evacuation of EDH and contused brain (Figure 3). He developed chest infection and suffered cardiac arrest on 18th post operative day. He was resuscitated and was gradually weaned of the ventilator. At three and half years follow up, his GCS is E2V1M3. He has spasticity of all the limbs and is on nasogastric feed. Left side scalp flap is sunken at the craniotomy site.

Figure 2

Figure 2: showing right frontal EDH after evacuation of contusion and figure 3 after 3 months of surgery

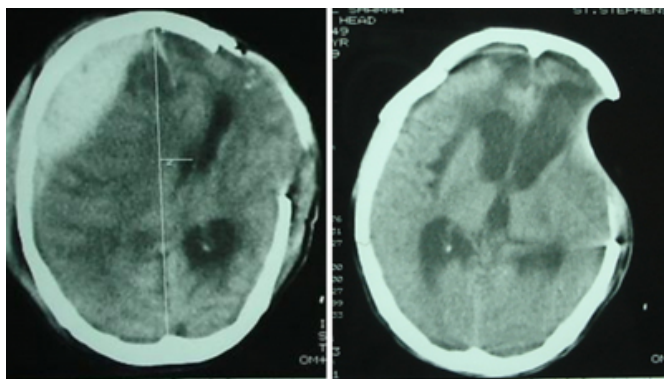


figure 2

figure3

DISCUSSION

Intraoperative development of contralateral EDH during the evacuation of traumatic contused brain tissue is rare. The hematoma is not present on the initial CT scan and develops on the contralateral side during craniotomy for traumatic brain lesion. At craniotomy, EDH is manifested by severe brain swelling after removing the contused portion of the brain. This swelling is due to contralateral EDH rather than hyperemia associated with diffuse axonal injury. CT scan of the head is needed to confirm the etiology of brain swelling. In a literature review, Feurman et al¹ collected 14 such cases and added three cases of their own. In their series they concluded that the outcome is poor in such cases. The poor outcome is related to severity of initial brain injury and secondary injury caused by formation of contralateral EDH.

Mechanism of formation of contralateral EDH is thought to be the rapid fall of the intracranial pressure and loss of cardiac tamponade effect of ipsilateral or contusion evacuated by craniotomy.^{2,3} Evans and Scheinker⁴ postulated vasomotor mechanism including vasoparalysis and vasospasm that interfere with the integrity of the blood vessel wall and cause hemorrhage. Kaufman et al⁵ reported

role coagulopathy in delayed formation of contralateral hematoma. In their study of 88 cases of surgically evacuated acute subdural hematoma (SDH), Matsuno et al⁶ found 2 patients to develop contralateral EDH and two patients with EDH associated with SDH. Eftekhari et al⁷ reported contralateral EDH following removal of EDH resulting in swelling of the brain at the site of surgery.

We feel that intraoperative brain swelling suggests development of contralateral EDH. Immediate CT scan of the head and evacuation of the offending hematoma are essential to the survival of the patient. If the patient does not recover quickly after removal of hematoma or unexplainable swelling of the brain occurs during operation, existence of fracture line on the contralateral side can be a clue to its development.

Yague et al⁸ reported a case of contralateral EDH which developed immediately after craniotomy for traumatic intracranial lesion. The author didn't notice any intraoperative brain bulge. Immediate postoperative CT scan is recommended in patients who do not show improvement for early detection of such complication. Contralateral exploratory burr holes are not preferred because CT scan will delineate the site and size of contralateral hematoma and will help in proper planning of the scalp flap. It will also rule out other causes of brain swelling such as operative site edema or fresh contusion, intracerebral hematoma or herniation.

CONCLUSION

Development of contralateral EDH during evacuation of traumatic brain lesion is rare but a fatal complication. The occurrence of perioperative brain swelling should raise the surgeon's suspicion and a CT scan of the head must be performed to confirm the lesion. Early diagnosis and evacuation of the hematoma are keys to successful management.

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