LARGE EPIDURAL HEMATOMA AFTER INTRACRANIAL PRESSURE MONITOR INSERTION: A CASE REPORT

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Abstract

A 65-year-old female with head injury presented with traumatic epidural hematoma. She was hit by a car while riding a bicycle and initially suffered loss of consciousness. Brain computed tomography (CT) showed epidural hematoma (EDH) with no significant bony fracture. The moderate head injury (GCS score 9) necessitated an intracranial pressure (ICP) monitor insertion, which revealed an enlarged EDH that needed emergency surgery. The patient's condition became stable afterwards and she was discharged about one month after the injury without any significant neurologic deficit.

Key words: Epidural hematoma, Intracranial pressure monitor

Introduction

Acute epidural hematoma (EDH) due to head injury is an emergency condition requiring immediate surgical intervention. Its peak incidence is around the second decade and the mean age is 20-30 years. It is less frequent in very young children, neonates, and those older than 50-60 years. The major causes are traffic-related accidents, fall, and assaults, which account for 53%, 30%, and 8% of EDH, respectively. Delayed epidural hematoma after decompressive surgery has also been reported. This report describes a rare case of enlarged EDH after ICP monitor insertion in an elderly patient with moderate head injury. A review of related literature is also made.

Case Report

A 65 year-old female was riding a bicycle when she was hit by a car and initially lost consciousness. At the Emergency Room (ER), her GCS score quickly worsened from 13 (E4M6V3) to 9 (E3M5V1). Brain CT showed left epidural hematoma, right subdural hematoma, and no significant midline shift or bony fracture (Fig. 1). Under the impression of moderate head injury with epidural and subdural hematoma, she underwent surgery for intra-cranial pressure (ICP) monitor insertion.

At the intensive care unit (ICU), under mild sedation, her ICP level was 6-7 mmHg initially. However, this increased to over 30 mmHg after 2 hours of surgery with note of anisocoria. Repeat brain CT showed left epidural hematoma, right subdural hematoma, and no significant midline shift or bony fracture (Fig. 1). Under the impression of moderate head injury with epidural and subdural hematoma, she underwent surgery for intra-cranial pressure (ICP) monitor insertion. Emergency craniectomy with hematoma evacuation was performed, which revealed skull bone fracture intra-operatively.
After almost two weeks of ICU care, the patient’s condition became stable. She was discharged a month later without significant neurologic deficit.

Fig. 1. A: Brain CT showed left temporo-occipital small EDH (<10 mm thickness with isodensity blood clot) (red arrow) and right frontal small SDH (<5 mm thickness) (yellow arrow) without significant midline shift. B: Bone window reveal no significant bony fracture but with left epicranial soft tissue swelling.

Fig. 2. Brain CT showed a large left temporo-occipito-parietal EDH (>15 mm thickness with mixed density blood clot or swirl sign) (red arrow), indicating active extravasation with significant midline shift (>5 mm) and severe brain swelling. An EVD with ICP monitor tube was also noted at the right parietal area and Foramen of Monroe (yellow arrow).
Discussion

Epidural hematomas (EDH) are characterized by bleeding into the space between the dura and the skull. About 85% of cases in adults is due to arterial injury.\(^1,4\) EDH can result from injury to the middle meningeal artery, the anterior meningeal artery, dural arterio-venous fistula, the middle meningeal vein, the diploic veins, or the venous sinuses. However, tearing of the middle meningeal artery is the main associated arterial injury.\(^1,4,5\)

The incidence of surgical and non-surgical EDH among traumatic head injury patients reportedly ranges from 2.7% to 4%.\(^1\) According to the recommended surgical management of acute epidural hematomas, an EDH >30 cm\(^3\) should be surgically evacuated regardless of the patient’s Glasgow Coma Scale (GCS) score, while immediate surgical evacuation is required for coma patient (GCS score <9) with anisocoria.\(^1\)

In this case report, non-surgical intervention was initially preferred because of old age, GCS score 9, and EDH <30 cm\(^3\) with <15 mm thickness and <5 mm midline shift. However, moderate head injury (GCS score 9) and need for intensive care later warranted extra-ventricular drainage (EVD) with ICP monitor insertion, which were done smoothly. Unfortunately, an enlarged EDH developed.

During the surgery, a linear skull bone fracture was also found. Su et al. reported acute EDH with skull bone fracture that developed after decompression surgery,\(^3\) while Jeong et al. presented cerebral epidural hematoma (EDH), possibly arising from excessive CSF drainage.\(^4\) Till now, no paper has reported on EDH associated with the procedure of ICP monitor insertion, especially in the elderly.

This case is being presented to share the thinking process involved in the management of head injury. Initially, in moderate head injury (GCS 9-13) with small EDH (<10 mm thickness) in an old patient, ICP monitoring is suggested as part of intensive care to maintain adequate cerebral perfusion pressure. However, an enlarged EDH was noted after ICP insertion in this case. It is not known if this enlarged EDH is part of the disease progression or if it is procedure-induced. It is known that large EDH can happen in old patients even without significant bony fracture line in CT scan image. The experience here supports the guidelines that recommend serial CT scan and close neurologic observation for non-surgically managed patients with acute EDH. The first follow-up should be obtained six-to-eight hours after head injury.\(^1\)

Conclusion

An unnecessary operated acute epidural hemorrhage can enlarged and require surgery after ICP monitor insertion in old patients. Serial brain CT scan is the optimal choice to detect intra-cranial lesions after head injury, especially in patients without surgical management. Moreover, skull bone fracture should still be considered in EDH patients with negative brain CT scan findings.

References

經顱內壓監視器置入術後硬腦膜外血腫擴大：一病例報告

黃志達，張坤權

摘要

一位 65 歲頭部外傷合併硬腦膜外血腫之女性病患。她在騎腳踏車時被車子撞到，有起始意識喪失的現象。起初的電腦斷層顯示為不須立即手術之硬腦膜外血腫且無明顯的顱骨骨折。因爲中度頭部外傷（昏迷指數為 9），顱內壓監視器置入是需要的。不幸的是，在顱內壓監視器置入後發現硬腦膜外血腫擴大。在緊急手術後，病人狀況穩定，並且在受傷後近一個月後出院，無明顯神經學上的缺損。

關鍵詞：硬腦膜外血腫，顱內壓監視器

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