

Delayed traumatic epidural hematoma of the posterior fossa

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ABSTRACT

The prompt use of computerized tomography has significantly enhanced the early localization of traumatic posterior fossa hematoma of the brain. Consequently, timely surgical intervention has been possible before irreversible damage has set in. The result is an overall improvement in the survival of patients with this condition. The clinical presentations of 2 children who developed traumatic posterior fossa epidural hematoma after a fall and were successfully operated upon, are presented. Computerized tomography scan of the brain of the first child was carried out on the day of admission and did not show any hematoma. The emergency computerized tomography scan of the brain that was carried out on the 3rd day when the patient became unresponsive localized the left epidural hematoma. Even though the 2nd patient was brought for treatment a week after the fall, his level of consciousness was good, an indication of the greatest prognostic factor, which with timely initiation of surgical intervention ensured a good outcome.

Keywords: Delayed epidural hematoma, posterior fossa, computerized tomography, children.

Neurosciences 2002; Vol. 7 (3): 198-200

It was Wharton who first described traumatic posterior fossa hematoma in 1901,¹ but it was not until 1941 that Coleman and Thompson reported the first successfully operated case.² Posterior fossa hematoma have been reported in 3% of all operated extradural hematomas^{3,4} and 0.3% of all intracranial hematomas.⁵ A history of occipital trauma was present in nearly all cases.⁶ Interestingly, most cases of epidural hematoma (EDH) were not related to motor vehicle accidents.¹ Occipital bone fractures were found in nearly 80% of cases.⁵ In more than 50% of EDH, no source of bleeding was found.⁷ Diffuse venous oozing from the edges of the fracture line or the surface of the stripped dura;¹ torn dural branches of the vertebral artery;⁸ laceration of a dural sinus¹ and emissary veins⁵ have all been described as sources of bleeding in EDH of the posterior fossa. Two cases of delayed traumatic epidural hematoma of the posterior fossa in 2 children were successfully

managed, are presented. The good outcome in these 2 patients was due to the correct diagnosis that was made early from careful neuro-observation, prompt computerized tomography (CT) localization and the speed with which surgery was initiated.

Case Report. Patient One. A 4-year-old Saudi boy survived a fall from a height of approximately 3 meters while playing at home. He did not lose consciousness but vomited repeatedly and was lethargic. Physical examination showed a conscious child with a pediatric coma score of 11/13. He was breathing spontaneously and had stable vital signs. He had no obvious injury on the head or any other part of the body. He had no focal neurological deficit. Plain skull radiographs of the skull and cervical spine did not reveal any fracture. A CT scan of the brain was carried out, 12 hours after the fall,

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Received 28th April 2001. Accepted for publication in final form 30th September 2001.

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and showed a fissure fracture of the left side of the occipital bone but no intracranial hematoma. The patient was admitted to the pediatric ward, where close neurosurgical observation was continued and conservative care progressed. He did well and did not vomit for 2 days. On the 3rd day, he started vomiting again and subsequently became unresponsive. An emergency CT scan of the brain showed a moderate sized epidural hematoma located in the left side of the posterior fossa (**Figure 1**). This hematoma extended from the site of the fracture to the region of the torcula and the left transverse sinus, distorting the 4th ventricle to the right and obliterating the ipsilateral basal cistern. An emergency surgical evacuation of the posterior fossa epidural hematoma was successfully carried out through a left sub occipital craniectomy. The fissure fracture in the occipital bone was found to be the source of the bleeding and the adjacent dura and venous sinus were intact. The patient's postoperative period was unevenful. He recovered fully and the follow up CT scan of the brain, confirmed complete evacuation of the hematoma and full expansion of the brain (**Figure 2**). He was discharged home and has been followed up in the neurosurgical outpatients' clinic.

Patient 2. A 7-year-old Saudi boy was brought to the Emergency Room one week after he fell from a height of approximately 3 meters at home while playing. He was unaffected until he started complaining of persistent headache and nausea accompanied by repeated vomiting, 7 days after the fall. He was conscious, with glasgow coma score (GCS)11 and had stable vital signs, Apart from a boggy swelling of the right side of the occiput, he had no focal neurological deficit. Radiological examination of the skull revealed a linear right-sided fracture of the occipital bone extending across the transverse sinus but not reaching the foramen magnum. He also had a fracture of the distal end of the right radius and ulna. He had no abdominal

tenderness and ultrasound excluded any intraperitoneal hemorrhage.

Computerized tomography scan of the brain showed a right epidural hematoma under the fracture causing a compression and shift of the 4th ventricle to the left side. Surgical evacuation of the hematoma was carried out. The source of the bleeding was the occipital fracture edges. Patient's postoperative period was uneventful and he made a complete recovery. He was discharged home and has been followed up in the neurosurgical outpatient clinic.

Discussion. Traumatic hematoma of the posterior fossa is not a common occurrence as it has been recorded in only 2-3% of all operated extradural hematomas¹ and 0.3% of all intracranial hematomas.² The appearance of any space occupying lesion in the posterior fossa, causes the most profound deleterious effect on the vital structures localized there and may not be detected until rapid deterioration has taken place. The vague symptoms and non-localizing signs that the patient presents with do not help either. A high degree of suspicion, based on a good history of occipital trauma and the presence of a fracture of the occipital bone may point in the direction of the correct diagnosis. Computerized tomography scan of the brain carried out early when the size of the hematoma has not compromised the hindbrain usually clinches the diagnosis. This facilitates early surgical evacuation of the hematoma and so ensures a good outcome. The 2 patients in this paper sustained their posterior fossa epidural hematoma as a result of a fall from a height and not from motor vehicle accident, Ammirati and Tomita¹ also had a similar result. Both patients presented with headache, repeated vomiting and lethargy as well as GCS. They did not have any lateralizing neurological signs. Skull radiographs did not demonstrate a fracture in the first patient but did in the 2nd. In the first case, the initial CT scan of the brain showed a fissure fracture of the



Figure 1 - Computerized tomography scan of patient one, showing acute epidural hematoma of the left posterior fossa.

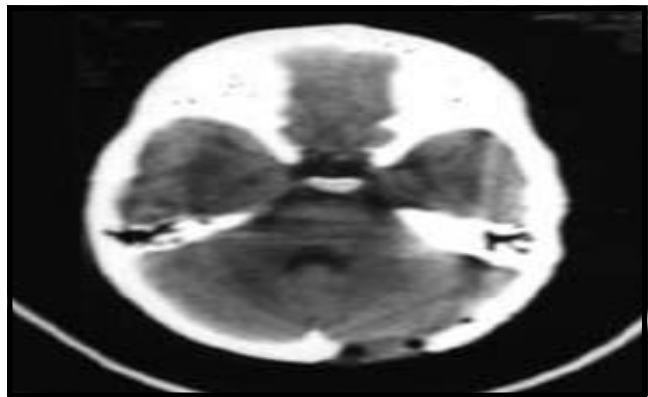


Figure 2 - Post-operative brain scan of patient one, showing restoration of the anatomy of the posterior fossa.

occipital bone without any underlying hematoma. In the same patient the subsequent CT scan of the brain that was carried out on the 3rd day of hospitalization showed a left sided occipital epidural hematoma that had accumulated in this period. The progressive pressure effect of the hematoma on the brain stem caused the decline in the level of consciousness. In the 2nd patient CT scan of the brain was carried out at presentation, which was 7 days after the fall and it revealed the right-sided posterior fossa epidural hematoma as the cause of the problem. In both patients, bleeding emanated from the edges of the occipital fracture and the stripped dura. This appears to be the case in a child's skull with its vascularity. The pressure effect on the posterior fossa structures continued to build as the hematoma accumulated and if unstopped reaches a point of no return. While a significant proportion of supratentorial epidural hematoma can be treated non-operatively, their posterior fossa counterpart cannot escape surgical intervention due to the limited space and the compressive effect on posterior fossa structures. Both patients fully recovered and were discharged home after successful surgical evacuation of their posterior fossa epidural hematoma. These 2 cases confirmed the findings of Roda et al⁷ and Pozzati et al⁹ who state that the level of consciousness at the time of surgical intervention and consequently the

speed with which surgery is initiated are the greatest prognostic factors in the management of epidural hematoma of the posterior fossa.

References

1. Ammirati M, Tomita T. Posterior fossa epidural hematoma during childhood. *Neurosurgery* 1984; 14: 541-547.
2. Coleman CC, Thompson JL. Extradural hemorrhage in the posterior fossa. *Surgery* 1941; 10: 985-989.
3. Robeson FC, Kishore PS, Miller JD. The value of serial computerized tomography in the management of severe head injury. *Surg Neurol* 1979; 12: 161-173.
4. Wright RL. Traumatic hematomas of the posterior cranial fossa. *J Neurosurg* 1966; 25: 402-408.
5. Gerza-Mercado R. Extradural hematoma of the posterior cranial fossa. Report of 7 cases with survival. *Neurosurgery* 1983; 59: 644-653.
6. Agbi CB, Victoratos G, Turnbull JW. Bilateral extradural hematoma extending from the foramen magnum to the vertex. *Surg Neurol* 1987; 28: 128-133.
7. Roda J, Gimenez D, Perez-Houras A. Posterior fossa epidural hematomas, review and synthesis. *Surg Neurol* 1983; 19: 419-428.
8. Arkins TJ, McLennan JE. Acute posterior fossa epidural hematomas in children. *Am J Dis Child* 1977; 131: 690-695.
9. Pozzati E, Tognetti F, Cavallo M, Acciari N. Extradural hematomas of the posterior fossa. Observations on a series of 32 consecutive cases treated after introduction of computerized tomography scanning. *Surg Neurol* 1989; 32: