Diagnosing depressed skull fracture in a young child

In this article...

- Risks associated with head injury and skull fracture
- The importance of monitoring and early diagnosis

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Head injury is the most common cause of death and disability in people aged below 40 years (National Institute for Health and Care Excellence, 2014). It accounts for 1.4 million attendances at accident and emergency departments in England and Wales a year, of which 200,000 people are admitted to hospital (NICE, 2014). Between 33-50% of attendances are in children aged less than 15 years (NICE, 2014). It is estimated that one in five patients admitted with a head injury has features suggestive of a skull fracture or have evidence of brain damage (NICE 2014).

The incidence of skull fractures in children presenting with head injury in accident and emergency units in the US ranges from 2% to 20% and intracranial injury associated with skull fractures is the leading cause of traumatic death in childhood (Caviness, 2014).

Skull fractures are traditionally classified as linear, depressed or open (Caviness, 2014).

Depressed skull fractures result from a significant force. It is estimated that 30% of depressed skull fractures in children have associated intracranial injuries. In addition to intracranial haemorrhage, complications such as compression of underlying brain parenchyma, intraparenchymal bone fragments and cosmetic deformity are also seen. Signs and symptoms of depressed skull fractures are outlined in Box 1.

All depressed skull fractures in children should be discussed and managed in consultation with a neurosurgeon as surgical elevation of the depressed fragment may be needed (Caviness, 2014).

In children with open skull fractures it is important to consider intravenous antibiotics and pneumococcal vaccination as they are at a high risk of developing pneumococcal meningitis (Caviness, 2014).

Case study

A one-year-old boy was brought to the emergency unit after being hit accidentally by a brick on the right side of his head.

On arrival, his heart rate was 146/min, respiratory rate 32/min and oxygen saturation 97% in air. He was drowsy but easily roused by his parents. The Glasgow Coma Scale score was 12/15, which could indicate an intracranial injury and raised intracranial pressure.

A neurological examination revealed left-sided hemiparesis indicative of raised intracranial pressure. A right-sided soft tissue swelling and haematoma along with a depression of the underlying bone was noted on palpation of his skull.

He was reviewed by an anaesthetist and his condition was considered to be stable. An urgent non-contrast computed tomography scan revealed a large depressed fracture (>5mm) involving the right fronto-parieto-occipital bone (Fig 1). The boy was reviewed by the neurosurgical team and an exploration and elevation of the depressed fragment was carried out on the same day.

He was admitted to the high dependency unit in the neurosurgical ward for regular observations of vital parameters, neurological status with paediatric GCS scoring and meticulous management of fluid balance and intravenous antibiotics.

The boy improved, his hemiparesis resolved within 24 hours of surgery and he started mobilising the next day. He was discharged home on the third post-operative day with advice on safety issues at home and in the playground.

He was referred to paediatric services and six months after the injury is reported to be progressing well.

Conclusions

This case illustrates the importance of being aware of depressed skull fractures in children. A trained member of staff should assess all patients within 15 minutes of arrival at hospital with a head injury (NICE, 2014). NT

References

Fig 1. Large right fronto-parieto-occipital bone simple depressed fracture

BOX 1. FRACTURE SIGNS

- Signs of open or depressed skull fracture or penetrating head injury
- Clear fluid running from the ears or nose
- Black eye with no associated damage around the eyes
- Bleeding from one or both ears and/or bruising behind one or both ears
- Penetrating injury signs
- Visible trauma to the scalp or skull

Source: NICE (2014)