



A RARE CASE OF ADULT GROWING SKULL FRACTURE

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**ABSTRACT**

Growing skull fracture (GSF), also known as post-traumatic leptomeningeal cyst or craniocerebral erosion, is an uncommon but clinically significant complication of pediatric head trauma. First described by Howship in 1816 and later termed "growing skull fracture" by Pia and Tönnis in 1953, this condition occurs almost exclusively in infants and young children, particularly those below 3 years of age. The incidence is low, accounting for only 0.05%–0.1% of all childhood skull fractures, yet its potential for progressive neurological deterioration underscores the importance of early recognition. The pathogenesis of GSF is multifactorial, with the critical event being a dural tear beneath a cranial fracture. Disruption of the dura allows herniation of the arachnoid membrane or brain tissue through the fracture line, interfering with normal osteoblastic activity and preventing fracture healing. Over time, the pulsatile forces of the developing brain drive progressive widening of the defect, leading to calvarial expansion and secondary neurological manifestations. Common presentations include scalp swelling, pulsatile cranial defects, and seizures, with the latter representing the most frequent symptom. While most cases are diagnosed in early childhood, presentation in adolescence or adulthood is exceedingly rare. The condition is typically classified into three types based on associated intracranial pathology: Type 1, characterized by leptomeningeal cyst formation; Type 2, associated with gliotic or damaged brain tissue; and Type 3, involving a porencephalic cyst. Management is surgical, focusing on repair of the dural defect and cranioplasty to restore cranial integrity and prevent further complications. Given its rarity and potential for late presentation, awareness of GSF is crucial, particularly in children with diastatic skull fractures or persistent scalp swellings following head trauma. Early detection and timely surgical intervention can prevent progression and long-term neurological sequelae.

**KEYWORDS :** Growing Skull Fracture; Post-Traumatic Leptomeningeal Cyst; Cranioplasty; Duroplasty

**INTRODUCTION**

Growing skull fracture is a rare complication of head injury in childhood. The incidence reported is only 0.05%–0.1% of skull fractures in childhood. Although the development of growing skull fractures is multifactorial, the predominant factor in their causation is the presence of lacerated dura.

Most commonly seen in paediatric trauma cases below the age of 3 yrs and very rarely presents with symptoms after 15 yrs of age. Most common clinical presentation is seizures.

**Background**

The growing skull fracture terminology was put forth by Pia and Tönnis in the German literature in 1953. However, this entity also known as "posttraumatic leptomeningeal cyst" or "cranio-cerebral erosion" was first described in the year 1816 by Howship in an 8-month-old baby.

**Case Report**

A 27-year old female with history of self fall while playing at the age of 3 yrs, presented with swelling in the right frontal region since the time of fall which started to progressively increase in size since 2 months and history of one episode of seizure 10 days back.

On examination: A defect of around 6 x 3 cm on right frontal region. no tenderness over the defect, CT scan was done which shown linear defect of size, MRI was done showing gliotic area at the site of defect. Patient was planned for surgery and underwent cranioplasty with titanium mesh along with duroplasty. patient is being followed up postoperatively since 1 year with no further complaints.



Fig 1: CT and MRI Scan

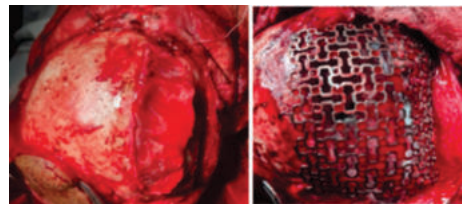


Fig 2 : Cranioplasty with Titanium Mesh Along with Duroplasty



Fig 3: Scar at Postoperative Followup.

**DISCUSSION**

Three factors are necessary for the occurrence of Growing skull fracture, a cranial bone fracture, an underlying dural tear and entrapment of the arachnoid membrane or brain tissue through fracture edges.

The pulsatile force of the brain during its growth causes the fracture in the thin skull to enlarge. This interposition of tissue prevents osteoblasts from migrating to the fracture site and inhibiting healing. The resorption of the adjacent bone by the continuous pressure from tissue herniation through the bone gap adds to the progression of the fracture line.

There are three types of growing skull fractures,

Type 1: growing skull fracture with leptomeningeal cyst which may be seen herniating through the skull defect in to the subgaleal space.

Type 2: damaged lesion or gliotic brain

Type 3: porencephalic cyst will be seen

can present as 1 or 2 types in combination most Common presentation being combination of type1 and type 2. surgical repairment of dura and cranium is the most widely applied treatment.

**CONCLUSION**

Growing skull fracture is a very rare complication following traumatic head injury in infants and toddlers below 3 years. All patients under the age of 3 years with diastatic skull fracture should be closely followed up and should be examined 2–3 months later to look for evidence of a growing skull fracture. Linear fractures and burst fractures in an infant with a scalp swelling must be corrected early to prevent growing skull fractures.

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**REFERENCES**

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