

Incidental retained tooth in epidural space following depressed skull fracture: A rare sequela of road traffic accident

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Abstract

Depressed skull fractures following road traffic accidents (RTA) are commonly associated with contamination and require urgent debridement to prevent infection and intracranial complications. The incidental presence of a foreign body such as a tooth fragment within the epidural space is extremely rare. We report the case of a 56-year-old male who sustained a contaminated left frontal depressed skull fracture after a two-wheeler accident, in whom a broken tooth was unexpectedly found in the epidural space during surgery. Early surgical debridement, meticulous wound cleaning, and broad-spectrum antibiotic coverage ensured a favorable outcome.

Keywords: Depressed Skull Fracture; Foreign Body; Tooth; Epidural Space; Debridement; Cranial Trauma

1. Introduction

Depressed skull fractures are serious cranial injuries often resulting from high-velocity trauma such as road traffic accidents. They frequently involve overlying scalp lacerations and contamination, especially in open fractures, predisposing patients to infections such as meningitis or brain abscesses if not adequately managed [1,2].

Retained foreign bodies within the cranial cavity are rare and may consist of bone fragments, metallic objects, or occasionally organic material [3]. However, the presence of a tooth within the epidural space secondary to trauma is exceedingly uncommon, with very few cases documented in the literature [6].

This case report highlights the clinical presentation, operative findings, and management of an open, contaminated depressed skull fracture with a retained tooth in the epidural space and discusses appropriate antibiotic strategies in such scenarios [1,4,5].

2. Case presentation

A 56-year-old male was brought to the Emergency Department following a two-wheeler collision (two-wheeler vs. Two-wheeler). He sustained a head injury and presented with a left frontal lacerated wound contaminated with soil. On arrival his GCS was GCS: E2V4M5 (11/15), Pupils: Bilateral 2 mm, reactive to light, moving all limbs, vitals stable. On Local examination: Ill-defined, contaminated lacerated wound in the left frontal region without CSF leak. CT Brain bone window (Fig:1a) revealed left frontal comminuted depressed skull fracture with un displacement of fracture of the left frontal sinus and small left temporal hematoma.

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The patient underwent emergency debridement and elevation of the left frontal comminuted depressed skull fracture under general anesthesia. Intraoperatively, the wound was contaminated with soil and debris. All depressed bony fragments were removed. The dura was found intact, with no cerebrospinal fluid leak.

Incidentally, a broken human tooth (Fig:1b) was identified within the epidural space and carefully removed. Thorough wound irrigation was performed using normal saline and hydrogen peroxide. Hemostasis was achieved, and the cranial defect was reconstructed using a titanium mesh.

Postoperatively, the patient was managed with antibiotic covering Cefoperazone-sulbactam, Amikacin, and Metronidazole (aerobic and anaerobic organisms), antiepileptic and analgesics were also administered. Postoperative CT brain (Fig:1c) showed satisfactory findings with no residual hematoma or infection. The patient's GCS improved to E4V5M6, with no signs of meningitis or wound infection. He was discharged in a stable condition.

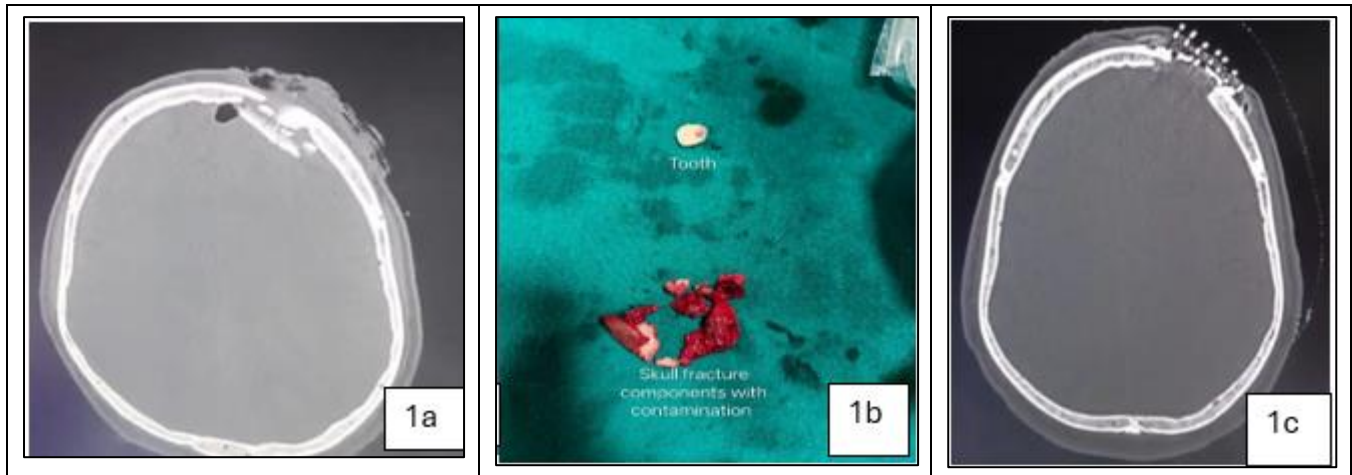


Figure 1 a Pre operative CT head bone window showed left frontal depressed compound fracture with epidural pneumocephalus and soft tissue changes. Fig 1 b Debride skull fracture components and tooth. Fig 1 c Post Operative CT head bone window showed left frontal well defined calvarial defect closed with titanium mesh without any remnant fracture components

3. Discussion

Depressed skull fractures are typically caused by high-energy blunt trauma, often involving open wounds that expose the cranial vault to contamination. Immediate management aims at preventing infection, seizures, and neurological deterioration [1].

The presence of foreign material in open skull fractures significantly increases the risk of intracranial infection. Soil, debris, and organic materials may serve as a nidus for bacterial growth. In this case, the incidental discovery of a broken tooth within the epidural space is remarkable. Similar cases are seldom reported; in most, the foreign body was introduced during trauma involving facial impact or dental injury [6]. Prompt identification and complete surgical removal of the foreign body are essential to prevent complications such as epidural abscess, meningitis, or osteomyelitis [2,3].

The standard of care for open, contaminated depressed skull fractures are early surgical intervention (within 24 hours), thorough debridement and removal of devitalized tissue and contaminants, repair of dural tears if present, cranial reconstruction using autologous bone or titanium mesh, broad-spectrum antibiotic therapy. Early debridement and irrigation likely prevented infection despite the presence of a tooth as a foreign body [1,4].

Antibiotic therapy in contaminated skull fractures should include coverage for both aerobic and anaerobic bacteria. Common regimens include Ceftriaxone or Cefoperazone-sulbactam for broad-spectrum Gram-positive and Gram-negative coverage, Metronidazole for anaerobes, and Aminoglycosides (e.g., Amikacin) in heavily contaminated wounds [5].

The combination used in this case Cefoperazone-sulbactam + Amikacin + Metronidazole is appropriate for polymicrobial contamination including soil-borne organisms. According to Bullock et al. (2006) and the Brain Trauma

Foundation guidelines, open depressed fractures should be managed surgically with antibiotic prophylaxis for 5–7 days [1,5]. The patient recovered completely with no infectious complications, underscoring the importance of early debridement, adequate irrigation, and rational antibiotic use [3,4].

4. Conclusion

Open depressed skull fractures require prompt recognition and meticulous surgical management. The presence of a tooth in the epidural space is a rare occurrence, likely introduced during the traumatic impact. Early debridement, removal of foreign material, and broad-spectrum antibiotics covering both aerobic and anaerobic bacteria are crucial to prevent intracranial infection. This case highlights the importance of thorough exploration in contaminated cranial wounds following trauma.

Compliance with ethical standards

Disclosure of conflict of interest

No conflict of interest to be disclosed.

Statement of informed consent

Informed consent was obtained from individual included in the study.

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