

**BRAIN INJURY****A Child'S Cranio-Brain Injury Due To A Nail  
At Donka National Hospital**

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**ABSTRACT:**

Cranio-brain injury is defined as an open cranial trauma resulting in a dural breach and putting the subarachnoid spaces in direct communication with the external environment. This is a 2-year-old girl with no particular history who was admitted for a scalp wound and weakness of the right hemi body following a domestic accident that had been evolving for 2 days. A clinical and radiological examination revealed a left parietal cranio-encephalic nail wound. She was taken to the operating room for nail extraction and duralplasty. The postoperative course was good. A probabilistic dual-antibiotic prophylaxis allowed us to avoid infectious complications. Cranio-encephalic wounds are rare. Those spawned by a nail are even rarer. Their treatment is both medical and surgical. They are often serious because of their vascular and infectious complications.

*Key words: brain injury, nail, CHU Donka.*

**INTRODUCTION:**

Cranio-brain injury is defined as open head trauma resulting in a dural breach and putting the subarachnoid spaces in direct communication with the external environment. They are rare, accounting for around 0.4% of all head injuries [1]. The causes are multiple, and the severity often depends on the nature of the penetrating object [2]. Cranio-encephalic nail injuries are much rarer and occur mainly during work accidents or suicide attempts. Their generally good

prognosis, structure, and weakness of the right hemibody are predominantly brachial and convulsive seizures. On clinical examination, she was an awake patient with a pediatric

Glasgow Coma of 15; afebrile. There was a motor deficit in the form of right hemiparesis, the overall muscular strength of which was 3/5 in the upper limb and 4/5 in the lower limb.

There is no sensory deficit to date. Muscle tone was preserved. There are no signs of damage to cranial nerve pairs. There were signs of irritation of the cortex, such as convulsive seizures. On craniofacial examination, we noted a left parietal punctiform wound sutured in two separate points, surmounted by a swelling of firm consistency and painful on palpation. However, it requires appropriate care to avoid the occurrence of complications, particularly vascular and infectious, which are major sources of morbidity and mortality [1].

### **CASE REPORT:**

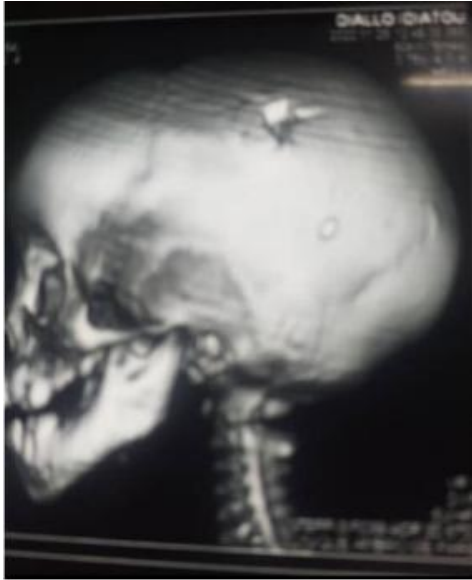
We report a case in which a 2-year-old girl suffered a cranio-brain injury following a domestic accident, resulting in a left parietal puncture wound. The patient had no history of the injury and was admitted to the department four days after the trauma.



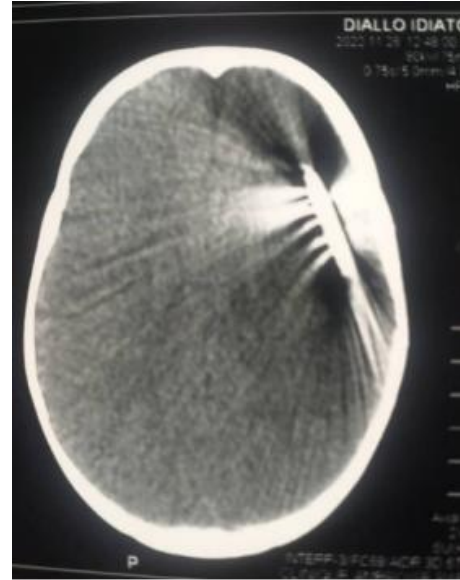
**Figure 1: shows a left parietal punctiform wound in the healing phase. An X-ray of the skull incidence profile was carried out three days after the trauma**



**Figure 2: A lateral x-ray of the skull reveals the intracranial frontoparietal nail**



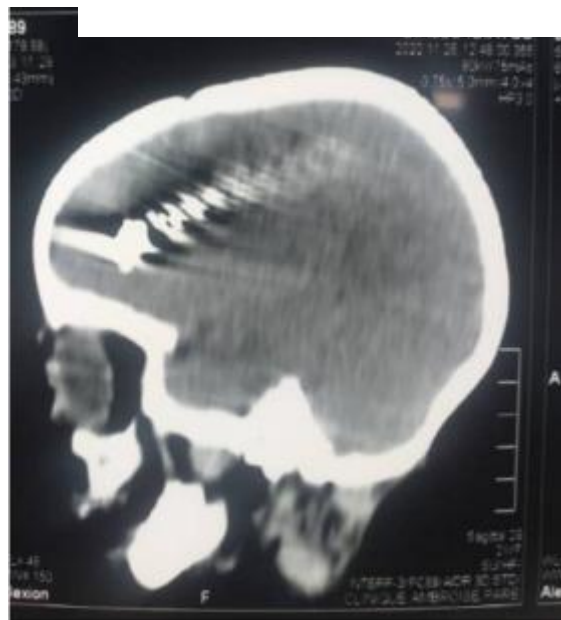
**Figure 3: Bone diet in 3D reconstruction, highlighting the entering location of the nail.**



**Figure 4: Parenchymal plan in axial section, revealing the nail intraparenchymal.**



**Figure 5: Parenchymal plan in sagittal reconstruction, exhibiting the nail intraparenchymal**



**Figure 6: Parenchymal plan in sagittal reconstruction, showing the nail intraparenchymal.**

A surgical indication such as foreign body removal and duralplasty was made. Funding problems delayed the intervention. The patient was taken to the operating room one week after her trauma for extraction of the nail and plasty of the dura mater.



**Figure 7: Anatomical landmarks (A) Trace of the incision; (B) coronal suture (C) Nail path**

**Operating protocol:** Patient in supine position under general anesthesia, orotracheal intubation, head supported by a makeshift headrest slightly turned to the right.

- Lower hinged arcuate incision was made. Hemostasis of bleeding origins.



**Figure 8: Incision and peeling of the skin.**

- We made a rectangular bone flap centered on the vulnerating agent through 4 trephine holes.



**Figure 9: Creation of the bone flap**

- Exposure of material embedded in the brain parenchyma.



**Figure 10: The foreign body embedded in the brain parenchyma through the flattened end**

- We proceeded to remove the material gradually and slowly, then cleaned it with physiological serum.



**Figure 11: The foreign body removed into the brain parenchyma**



- Dura mater plasty using 3-0 absorbable suture.



**Figure 12: Dura mater plasty**

- We proceeded with the installation of the bone flap then fixed using the 1-0 absorbable suture.



**Figure 13 Placement of the bone flap**

- Closure of the operating wound plan by plan



**Figure 14: Sutured operating wound**



**Figure 15: The condition of the wound after the first dressing 4 days after surgery**



**Figure 16: Removal of stitches with the 2nd dressing**



*8 days post-operative*

After removal of the wires, the patient benefited from physiotherapy sessions for 4 days then released 13 days post-operatively with a clear improvement in her clinical condition with frequent follow-up appointments.



## **DISCUSSION:**

Cranioencephalic injuries are rare, accounting for around 0.4% of all head injuries [1]. Penetrating head injuries by nails, more rarely reported in the literature, are also, most often, projectiles and frequently occur accidentally in the workplace or during suicide attempts [3]. A 2019 Malian study has identified, since 2006, 23 cases of penetrating head trauma by nail, including 5 non-projectile secondary to a physical attack [4]. The context of the occurrence for our patient was a domestic accident.

Pathophysiologically, nail penetration often causes initial localized brain lesions [1]. This translates clinically into minimal neurological disorders, often without impairment of consciousness, as in the case of our patient, who presented with a motor deficit such as right hemiparesis without initial loss of consciousness. Post-traumatic epilepsy occurs in 30 to 50% of cases of penetrating head trauma; it may require prophylactic anticonvulsant treatment. [5]. This was the case with our patient, who presented with convulsive attacks and benefited from prophylactic anticonvulsant treatment based on phenobarbital. Radiography of the skull in frontal and lateral views finds little interest in recent literature [6]. However, it is very useful for specifying the topography and size of foreign bodies, especially metallic ones. However, brain scanning remains the first-line examination, especially in the early phase of cranioencephalic trauma. It has considerably modified the diagnostic and therapeutic approach. This examination also made it possible to identify associated intracranial lesions [7]. Our patient's treatment consisted of two parts: medical and surgical. Medical treatment always precedes surgery. It is based on the prevention of infection, including tetanus serovaccination and antibiotic prophylaxis primarily targeting staphylococcus (combination of 3rd generation cephalosporin, aminoglycosides, and imidazoles) [8]. The postoperative course was good, marked by the disappearance of the convulsive attacks and the gradual recovery of the right hemisphere weakness. A control brain CT was requested but not carried out due to a lack of financial resources.

## CONCLUSION:

Cranioencephalic wounds are rare. Those caused by a nail are even rarer. Their treatment is medical and surgical. They are often serious due to their vascular and infectious complications.

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