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# Organized Chronic Subdural Hematoma Mimicking a Chronic Epidural Hematoma (Case Report)

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**Abstract** | **Case Report**

Subdural hematoma is a common disease in neurosurgery with specific radiological characteristics. Organized subdural hematoma, albeit less common, was nonetheless reported in literature. In this article we report the case of a misdiagnosed organized subdural hematoma mimicking an epidural hematoma which was observed in an 8-year-old patient that underwent VP shunt for hydrocephalus at 40 days old, complicated with meningitis and who suffered a head trauma 4 years later, presenting with a sudden generalized tonic clonic seizure for which she was stabilized under adequate treatment. A CT scan performed after revealed a biconvex-shaped hypodense mass along the left temporoparietal cerebral convexity, which was interpreted first as a chronic epidural hematoma. As such, and taking in context the clinical situation of the patient, a craniotomy was performed during which no epidural hematoma was discovered and an OSDH was located after incising the dura. A total evacuation was performed and the patient had fully recovered and improved. Thus, it is essential to bring forward such cases where radiological imagery can be misleading and to put forward detailed differential characteristics between OSDH et EDH through more radiological studies.

**Keywords:** Organized subdural hematoma (OSDH), Epidural hematoma (EDH), Misdiagnosis, Pediatric neurosurgery, Computed tomography (CT), Craniotomy.



## INTRODUCTION

An organized subdural hematoma (OSDH) mimicking an epidural hematoma (EDH) is an extremely rare diagnosis. Specific imaging features, especially on Computed Tomography, are usually reliable for distinguishing between these two conditions, but the organized characteristic of a chronic subdural hematoma can alter its typical appearance and lead to misdiagnosis.

## CASE REPORT

We present the case of an 8-year-old girl, who was referred to our emergency for a tonic clonic seizure for which she received antiepileptic drugs.

After stabilization, the patient was drowsy, apyretic, with a GCS of 10, pupils in tight myosis, and spontaneously mobilizing the 4 limbs without blatant asymmetry.

After further investigation, the patient had undergone a VP shunt related surgery at 40 days of age for malformative hydrocephalus. She was treated for post operative meningitis and was on follow up since 3-year-old for epileptic seizures, put under antiepileptics since, with the last seizure dating back to 10 months before her current one. We also found out the patient had a head trauma at the age of 4, after which an epidural hematoma was discovered. No indication for surgery was retained and the patient was monitored since.

A CT scan was performed for further investigation, which showed a large left hemispheric hypodense biconvex collection with a dense calcified membrane and a midline deviation [1], a typical image of a chronic epidural hematoma. An MRI was also performed [2] which later confirmed the diagnosis.

Taking into account the large volume of the hematoma and the clinical status of the patient that didn't seem to improve, a surgical evacuation was decided.

The patient was admitted to the OR. A question mark incision was performed [3,4] after which 4 burr holes were made for the craniotomy. To our surprise, no epidural hematoma was noticed beneath the bone flap [5]. Upon the dura mater incision, a light gray capsule was revealed [6,11]. Upon capsule incision, a large

quantity of aged brown blood with blood clots and yellow material was encountered [7,8]. After clearing the bloody component, we began to separate than excise the capsule wall from the dura [9]. The evacuation was thoroughly successful [10]. Post operatively, the patient demonstrated improvement and was discharged for follow up. Post operative pathological examination of the yellow material revealed an organized hematoma [12].

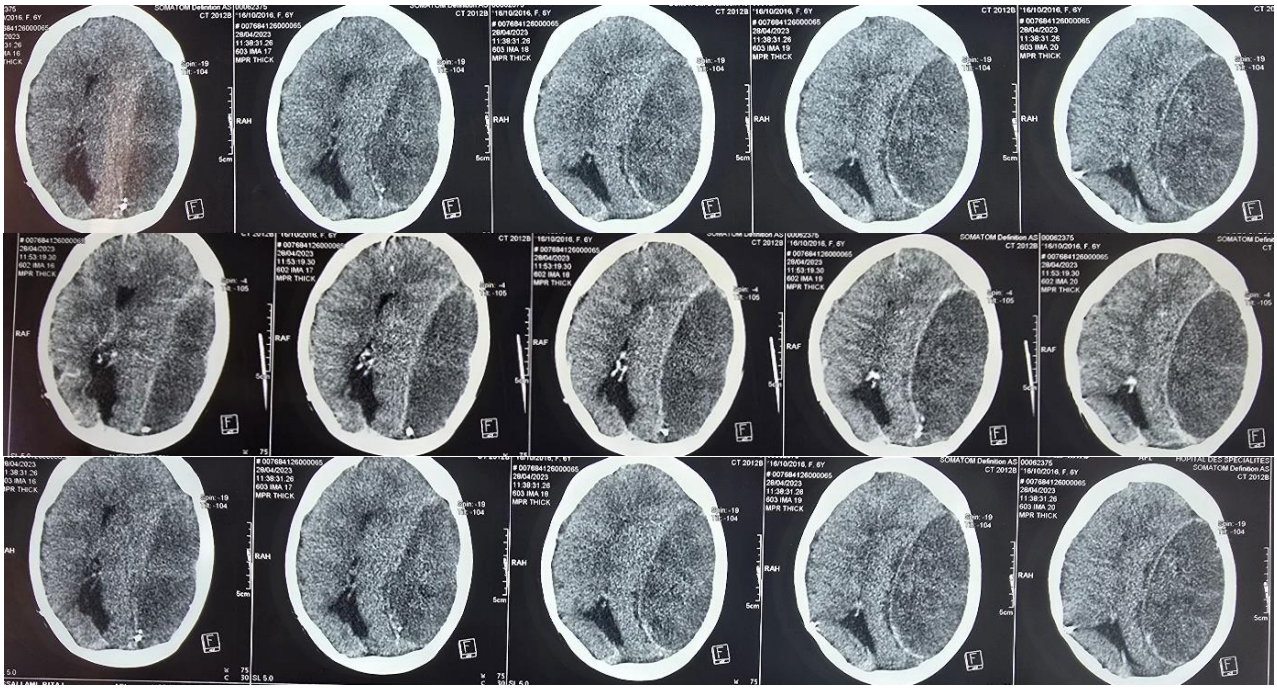


**Figure 1: A C- cranial CT scan showing a large left hemispheric hypodense biconvex collection with a dense calcified membrane and a midline deviation**

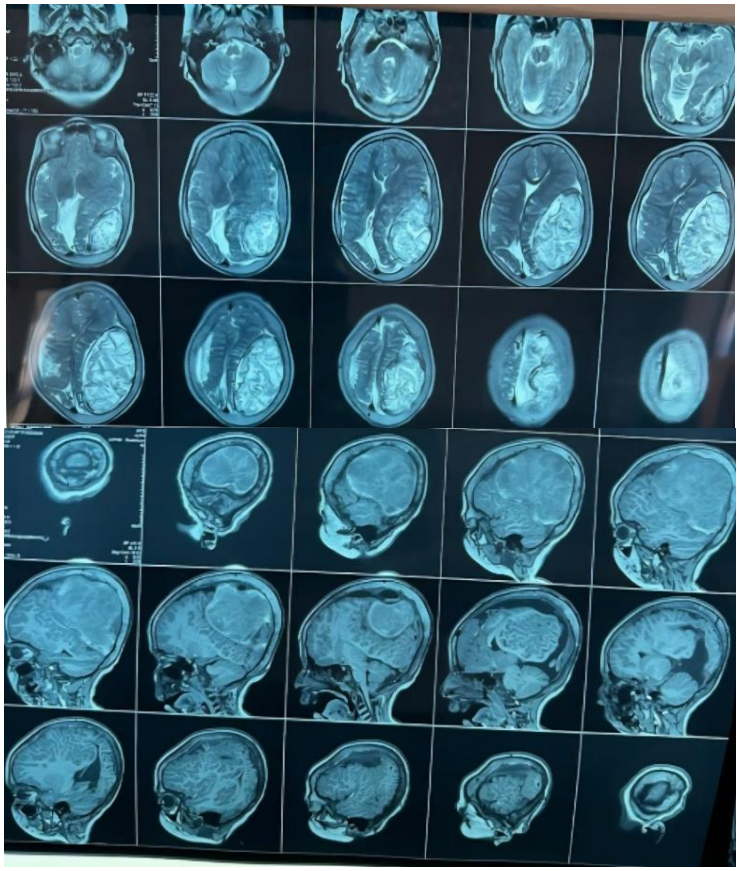
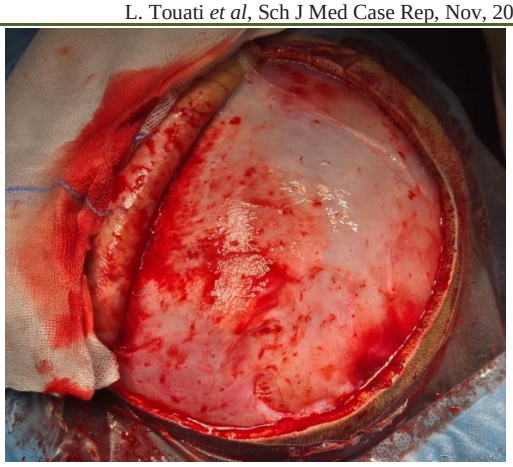


**Figure 2: A T1 and T2 sequenced MRI further confirmed the diagnosis**

**Figures 3 and 4: A large question mark was chosen for the procedure for maximum exposure**

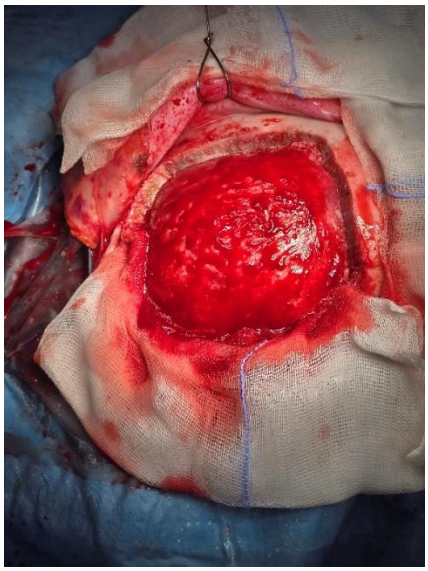


**Figure 5: The craniotomy was performed revealing the dura underneath with no visible hematoma**

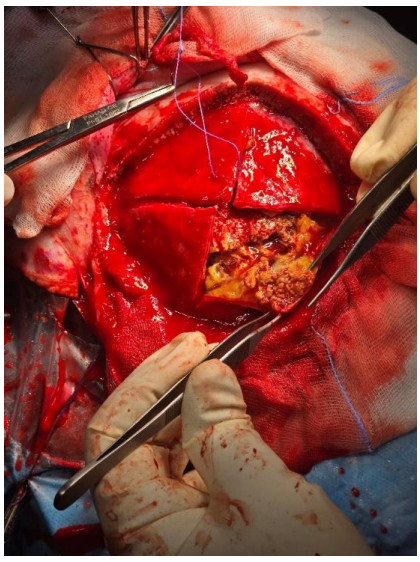
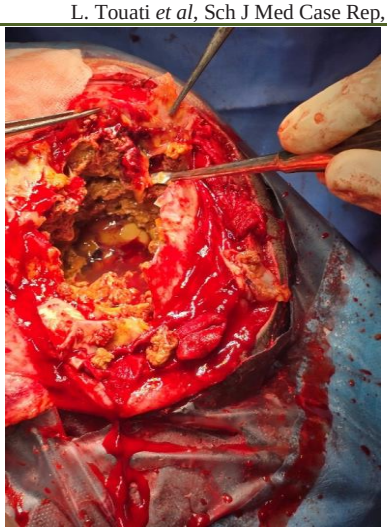


**Figure 6: The dura was incised following and X-shape, revealing a capsule with loose adhesions**

**Figures 7 and 8: After incising the capsule, we began evacuating a large quantity of yellowish material with blood clots**

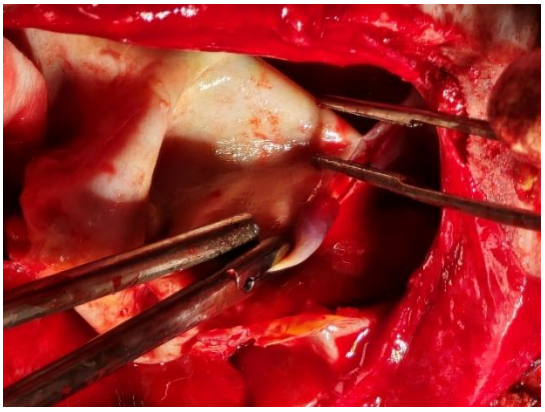


**Figure 9: the capsule was carefully separated from the dura**

**Figure 11: the capsule was light-gray, fully separated and existed**

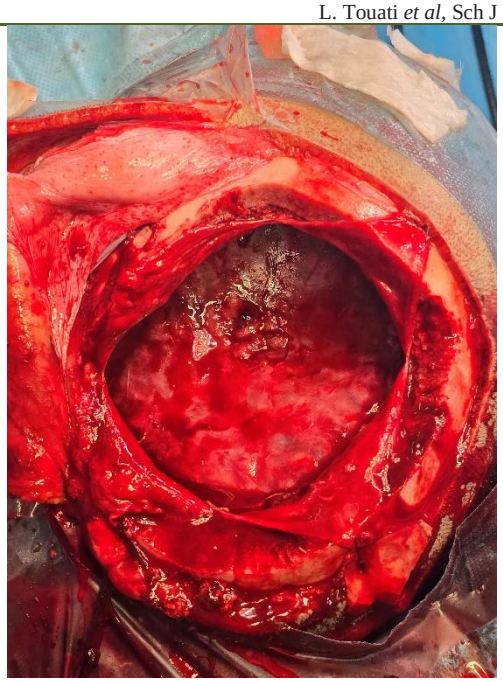


**Figure 10: The hematoma was fully evacuated and the capsule excised, showing the parenchyma underneath**

**Figure 12: A piece of the evacuated materiel later confirmed to be organized hematoma**

## DISCUSSION

An organized subdural hematoma (OSDH) is a chronic subdural hematoma that has developed a thickened, fibrous capsule. Both neurological symptoms and imaging findings are usually misleading due to atypical characteristics. Although OSDH classically appear crescent-shaped on a computed tomography, an organized or encapsulated SDH can sometimes mimic the lentiform appearance of an epidural hematoma [3]. This atypical shape can be caused by the hematoma being encapsulated by thickened inner and outer fibrous membranes [2]. This can present a diagnostic challenge, as the typical imaging features that distinguish these two conditions are absent [4,5].

In our case the initial diagnosis was misleading first due to atypical manifestation of the hematoma on CT scans. It showed a hypodense biconvex collection with a dense calcified membrane. The CT manifestations of organized chronic subdural hematoma are usually crescent or semilunar low-density shadows with rough boundaries. [1]. The cerebrospinal fluid between the organized hematoma and the brain tissue manifests as a less dense signal [2]. On the other hand, a chronic epidural hematoma presents as a fusiform low-density shadow with sharp boundary. Chronic epidural hematoma may also show peripheral enhancement of the dura and membrane formation between the hematoma

and adjacent brain parenchyma. In our case, no skull fracture was observed.

Furthermore, the clinical aspect of the patient's preoperative state did not suggest an epidural hematoma outside of the head trauma. No awake intermediate period was reported during the trauma, nor a worsening was spotted outside of the convulsive state.

Overdrainage from a ventriculoperitoneal shunt is a recognized cause of OSDH, as well as post-meningitis sequelae and head trauma [6]. Our patient having undergone a VP shunt for hydrocephalus, followed by meningitis and later on head trauma, presented all three risks of developing Ashtha exact mechanism is not fully understood but is mostly common in children and young adults [7]. The majority of cases of OSDH are asymptomatic. The most common symptoms include seizures, headaches, confusion, memory impairment, and weakness [8].

While an MRI can distinguish an epidural hematoma from a subdural hematoma in case of confusion, in our case the imaging was ambiguous due to the organized aspect of the hematoma. The most common traits to differentiate the organized aspect of the subdural hematoma from an epidural hematoma are mainly the presence of linear septations within the hematoma which indicated organization [9], the membrane enhancement of the OSDH after contrast injection and the placement of the dura above the hematoma [9,10]. Upon revising the MRI imaging, the OSDH in this case appeared confined to an area of the convexity instead of crossing suture lines, while the membrane encapsulating the hematoma mimicked a displaced dura laying below the hematoma, which added to the confusion.

## CONCLUSION

Although OSDH is a widely known and easily diagnosed entity, some cases can be misleading due to equivocal and sometimes misleading imagery that can lead confusion to misdiagnosis with epidural hematoma. More research that will lead to a standardized specifications of both entities would be essential.

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