



A RARE CASE ILLUSTRATION: CALCIFIED CHRONIC SUBDURAL HEMATOMA POST CRANIECTOMY.

Neurosurgery

Dr. Agraj Mishra	M.ch Neurosurgery, Senior Resident, Department of Neurosurgery, B.J. Medical College and Sassoon Hospital
Dr. Ankit Daware	M.ch Neurosurgery, Senior Resident, Department of Neurosurgery, B.J. Medical College and Sassoon Hospital
Dr. Jaikumar Gunjkar	M.ch Neurosurgery, Associate Professor, Department of Neurosurgery, B.J. Medical College and Sassoon Hospital

ABSTRACT

Background: Case of calcified chronic Subdural hematomas are variant of chronic subdural hematoma and very few studies have been published of this case and even none of the studies have showed the occurrence of Chronic calcified subdural hematoma in previously operated craniectomy patient making it even a rarer variant and need to be discussed further. **Objective:** The purpose of our study is to elaborate about possible pathogenesis of the calcified chronic subdural hematoma and management. **Methods and material:** Here we have reported a case of male patient who underwent craniectomy in our tertiary care government hospital and presented with calcified hematoma after 2 years which was diagnosed on MRI imaging and subsequent scanning. **Results:** After proper investigations Calcified chronic subdural hematoma was surgically excised with separation of membrane from the underlying brain parenchyma and postoperatively patient had no neurological deficits and discharged. **Conclusions:** Calcified chronic subdural hematoma is a rare event and its management should be excision of the calcified portion from the underlying brain parenchyma.

KEYWORDS

Surgery, MRI, Calcified chronic subdural hematoma, CT

INTRODUCTION:

Chronic subdural hematoma (CSDH) is a common entity in neurosurgical practice and when it causes sufficient compression of brain parenchyma it needs to be evacuated urgently and been described with liquified hematoma of the subdural space and occur after least 4 weeks after head injury or trauma. Calcified chronic subdural hematomas (CCSDHs) are not a known variants of chronic subdural hematomas accounting to only <2% of all CSDHs^{1,2,3}.

If CSDs went untreated then it follows calcification, making a hard proteinaceous content above the brain parenchyma, as calcified chronic subdural hematoma (CCSDHs). It was first described by Von Rokytansky in 1884⁴. Many researches have been made on this field but none of them have mentioned about the case on a variant of CCSDHs developed after craniotomy.

Various theories have been suggested but the most accepted theory for the cause is minor inertial brain injury which leads to movement of the brain in the compact space of skull and tearing of bridging veins of the dural layer causing hematoma which subsequently causes calcification of the clot.

It is similar with an armour encapsulating the brain and thus sometimes referred to as armoured brain. What leads to calcification is still not clear but thoughts are that it is in process from hyalinization followed by calcification. The main cause for the occurrence is head trauma and it take around months to develop⁵. The calcification only occurs at periphery, and the composition are clay like or gelatinous consistency. Although the clear mechanism is not known and thought to be multifactorial involving metabolic and vascular factors⁶.

METHODS:

Here we illustrate a rare case report on 24 years old male who underwent craniotomy and presented with CCSDHs. Consent of the patient with institutional approval has been taken before publication of the case with IEC number 0222022-022.

Case report:

A 24 years old male who underwent left side frontal-temporo-parietal craniectomy 2 years back in May 2021 for left temporal contusion with acute left parietal SDH in our tertiary care government hospital and as patient didn't show up on follow up and came after 2 years with complaint of headache and giddiness for last 20 days. On evaluation he has a boggy non pulsatile huge swelling at his craniectomy defect. On presentation, he was conscious, oriented and obeys command with no neurological deficits.

Figure 1: Pre operative picture of patient.

On radiographic evaluation, MRI Brain suggestive of calcified collection of biconvex shape in subdural space of frontal and parietal regions. The subdural collections mimicking epidural hematoma due to its lenticular shaped and shows two separate collections.

Figure 2: MRI brain showing biconvex calcified subdural collection in left frontal-parietal region.

The patient is planned for excision of calcified hematoma. Under general anaesthesia, in supine position with head and shoulder rotated towards right side, through previous incision mark skin flap is raised separating the dura from the skin flap. The Dural membrane is then opened and calcified hematoma was seen along with liquified part and was separated from the inner layer of arachnoid membrane and the brain adhesions been removed cautiously. The Dural margins been cauterized to prevent any chance of subsequent bleeding and formations of hematoma and irrigated with saline. Dura repair with fascia lata from thigh been done and the skin is closed in layers. The patient was extubated after surgery and been shifted to ward.

Figure 3: Intraoperative picture.

His post operative GCS was 15 and was vitally stable. Post operatively CT Head was done showing resolution of the calcified hematoma and no active bleeding. Patient was discharged after 5 days on oral antibiotics and after 10 days stitch removal was done.

Post operative CT was done which showed resolution of hematoma.

Figure 4: Post operative CT.

DISCUSSION:

CSDH as the name suggests arises on the dural border cell layer, which are thin layer of cells in between the dural layer and arachnoid layer encapsulating the brain parenchyma with intercellular connections fragile to separation^{7,8,9,10}. Development of CSDH requires a The predisposing factor of CSDH are shrinkage of the volume with in the skull (e.g., the elderly atrophic brain, the alcoholic brain, or the over draining cerebrospinal fluid [CSF] shunt), and many times the precipitant injury that can be so minor not detectable in the history^{11,12}. The ASDHs commonly occurs cause of tearing of bridging veins in between dural layer or by tearing of cortical veins or arteries¹³. If not surgically removed by craniotomy or sometimes due to small size usually be resorbed, but in some cases it does leads to incomplete

resorption and the hematoma will become chronic as lysis of clot occurs. After the lysis, the clot will expand which occurs as a result of the local inflammatory reaction at the clot, resulting in fibrinolysis and angiogenic factors production which promote neovascularization and fragile capillaries bleeding with intravascular thrombosis along with poor circulation and absorption in subdural space leading to calcification^{14,15}. These process of deposition of calcium particle and hyalinization takes about 6 months to many years from the initial trauma. In our case as patient underwent frontal-parieto-temporal craniectomy 2 years back and as discussed minor trivial trauma can also leads to injury of bridging vein and subsequent formation of calcified hematoma. Additionally, calcification can also be caused by abnormal inherent metabolic tendency. However, the exact mechanism of calcification is unknown and calcification periods are different in each cases¹⁶.

In our case patient presented with complaint of headache and giddiness but CCSHDs can present with many of the symptoms like headache, vomiting, giddiness, mental retardation, seizure, dementia, hemiparesis and with neurological deficits^{17,18}.

The treatment of non-calcified chronic subdural hematomas is drainage of the underlying collection either by burr hole evacuation or preferred localized craniotomy with excision of membrane. But in the case of calcified subdural hematoma mere removal of hematoma doesn't do the trick and separation of underlying inner layer of the calcified membrane from underlying brain parenchyma is needed.

Excision of subdural calcified hematomas is the problem solver as it improves the morbidity with improvement of cerebral blood flow^{19,20}. We performed a surgical excision of the calcified subdural hematoma and drainage of fluid along with removal of adherent inner membrane from brain parenchyma with cauterization of Dural edges to prevent any subsequent bleeding.

Complications after surgery of calcified hematoma are severe and can lead to collection of hematoma beneath the dura matter as the expansion of brain matter may take time or can also lead to new neurological deficit occurred after dissection of inner membrane adhered to brain parenchyma. Sometimes the disappearance of residual collection can take up months after surgery.

CONCLUSION:

Chronic calcified subdural hematoma after craniectomy is a rare event and is to be managed accordingly. In our case we have surgically excised the calcified hematoma with exhaustive separation of inner membrane from the brain parenchyma. Through our case study we recommend excision of calcified hematoma in such cases.

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Abbreviation:

CSDH: Chronic Subdural hematoma
CCSDH: Calcified Chronic Subdural hematoma
MRI: Magnetic resonance imaging
CT: Computed Tomography
GCS: Glasgow coma scale

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