

Armoured brain of unknown etiology

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ABSTRACT

Armoured brain is a rare condition where dense calcification occurs over the brain. It can result in mass effect and raised intracranial pressure. Most often, it happens due to trauma, subdural effusion, infection, or after VP shunt. There is controversy in its treatment. Most published literature does not support removing the calcification. We describe a rare case of idiopathic chronic calcified subdural hematoma with relatively short history which was successfully treated by microsurgical removal of calcification over the brain. This resulted in complete expansion of the brain with relief in symptoms.

Key words: Armoured brain, calcified subdural hematoma, Matrioska head

Introduction

Calcified chronic subdural hematoma (SDH) or armoured brain is confusing and a rare entity with poorly understood pathophysiology. It occurs secondary to trauma, subdural effusion, meningitis, or as a sequel of VP Shunt.^[1] There is confusion about its treatment as well. Interval between subdural hematoma and development of calcified chronic SDH varies from 6 months to many years.^[2,3] We present a rare case of armoured brain with relatively short history without preceding trauma or infection.

Case Report

A 15-year-old female child presented with history of one episode of generalized seizures followed by loss of consciousness for about 10-15 seconds 6 weeks ago. Since then, she was suffering with headache which was frontal, dull, and moderate without any nausea or vomiting. There was no history of trauma, fever, meningitis.

She was fully conscious, Glasgow Coma Score was 15/15 with no neurological deficit. There were no cerebellar, meningeal

or frontal lobe signs. All routine hematological investigations and coagulation profile were normal.

CT scan brain revealed bifrontal extraaxial hypodense collection with calcified inner layer of about 3-4 mm thickness over the brain causing mass effect [Figure 1].

She was started on phenytoin sodium and subsequently underwent bifrontal craniotomy. There was about 50 ml of subdural collection which was clear serous, non foul smelling. Surface of the brain was covered with thick whitish egg shell like calcification which was carefully peeled off from the surface of brain [Figure 2]. After surgery patient's headache was relieved within 2-3 weeks with no seizure after surgery.

Follow-up CT scan after one year showed complete expansion of brain with no mass effect [Figure 3].

Discussion

Armoured brain^[4] or Matrioska head^[5] is a condition where a huge calcified chronic subdural hematoma covers the brain. Matrioska head derives its name from famous Russian doll and it got rechristened as armoured brain as calcification to provide additional protection as helmet inside the brain. Since the initial report there has been only limited literature available about it. Whereas chronic subdural hematoma is relatively a common condition, the incidence of calcified chronic SDH is reported between 0.8% to 10%.^[6,7] Calcified chronic SDH has been observed as late complication of head injury or late sequel of post meningitis subdural effusion. It has also been reported as delayed complication of VP shunt.^[1] Pathogenesis of calcification is poorly understood. It is proposed that metabolic and vascular factors may play a role. Vascular thrombosis may have contributory role.^[8] There may be a role of local factors in the development

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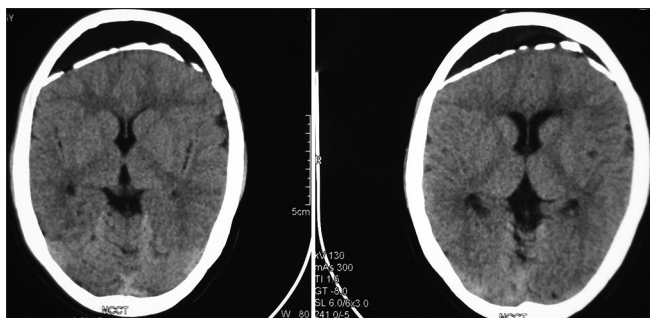


Figure 1: Pre operative CT scan. Calcified subdural hematoma showing calcification in inner layer of duramater

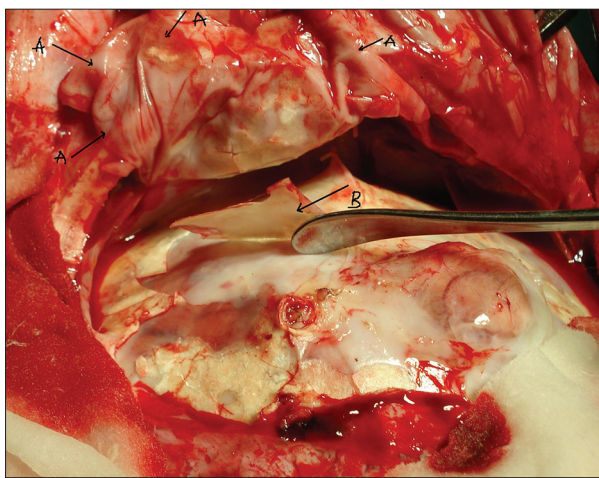


Figure 2: Intra operative photo showing outer layer of duramater (A) and peeled of calcification from brain surface (B)

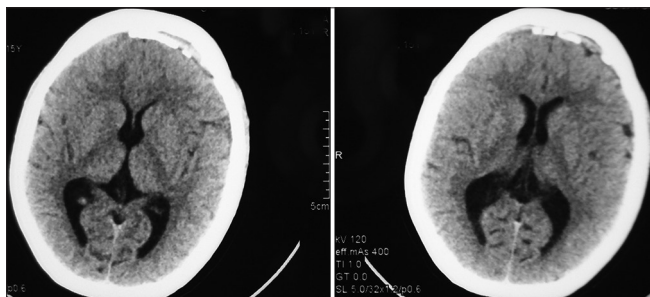


Figure 3: Post operative CT scan one year after surgery with complete brain expansion

of calcification and metabolic predisposition may be responsible.^[9] The development of calcification may take 6 months to several years.

The calcifications have been reported mostly along the inner surface of duramater. However, calcification of both outer and inner layers in bilateral chronic SDH has also been reported.^[10]

The calcifications can be unilateral, bilateral, partial or complete. Both inner and outer layer may be calcified. Thickness of calcification can also vary.^[2,3,5]

Indication of the surgery includes features of raised intracranial pressure, headache, or neurological deterioration.^[4,6,10] Some believe that asymptomatic, old patients may be kept for observations alone.^[10]

The surgical techniques in calcified chronic SDH have been variably reported. Many authors have performed twist drill aspiration, burr hole aspiration or microsurgical dissection. Microsurgical dissection of calcified hematoma from brain surface can result in brain contusion, bleeding, and appearance of new neurological deficit.^[11-13] Therefore, many neurosurgeons do not advise removal of inner calcified membrane. But this may result in failure of treatment and inevitable recurrence of symptoms.^[2]

The surgical strategies are therefore dependent upon the thickness and extent of calcification. In our case, we were able to peel off the calcified portion easily. The thickness of calcification in our case was 4 to 5 mm. In cases where the thickness and extent of calcification is more, some neurosurgeons^[2] recommended drilling of the calcified layer above the inner membrane.

The type of fluid in chronic SDH varies greatly ranging from bright red liquid through to thick engine oil to light, serous fluid. In our case fluid was light serous. Long standing calcified chronic SDH is thicker than those with shorter history. We feel that it is possible to completely peel off the calcified layer at early stages of calcified chronic SDH. We, therefore, propose that attempts shall be made to microscopically dissect out the calcified layer in patients with calcified chronic SDH with shorter history and not so thick calcification.

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