

## Case Report

# Calcified chronic subdural hematoma (CCSH): report of two cases

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**Abstract:** Calcification of hematoma is seen rarely although chronic subdural hematoma (CSH) is a well-known. We present two cases with calcified subdural hematoma. 35 years old female who admitted to our hospital with a complaint of epilepsy and 58 years old male who was diagnosed as calcified subdural hematoma incidentally. We performed a wide craniotomy and duratomy including the whole of CCSH reaching dural arachnoid border and we dissected the calcified mass from arachnoid and invaginations to the brain in both of the patients. We did not observe deficit in both of our patients following operation and discharged them at the postoperative 3rd day with recommendation of antiepileptic for a month.

**Keywords:** Calcified chronic subdural hematoma, craniotomy, treatment

### Introduction

Chronic subdural hematoma (CSH) develops due to cortical, bridge vein or sinus laceration or cortical vessel laceration in cases with weak arachnoid trabecula following minor trauma. Fibrin deposits accumulate on clot surface and adhere to dura. Fibroblasts arising from dura surround the clot and outer and inner capsule develops and separates dura and arachnoid. Capsule strengthens with connective tissue in a few months and hyalinises in a couple of years. Degradation of intracapsular blood and fibrin, increase in osmotic pressure, liquid flow through semi permeable capsule, intracapsular bleeding of fragile, highly permeable neo vascularization results with enlarged hematoma. Calcification of hematoma is quite rare [1-5].

We present two cases with calcified chronic subdural hematoma (CCSH).

### Case report

**Case 1:** 35 years old female admitted to our hospital with epilepsy. She did not have a complaint up to this age. She did not have a history of trauma. Her neurological examination was

found to be normal (**Table 1**). Her Magnetic Resonance Image (MRI) revealed a concave CCSH 12×8×20 cm involving the left subdural area (**Figure 1**).

**Case 2:** 58 years old male have been undergoing checkup examination in every 6 months. Bilateral primary optic atrophy was detected at her last checkup examination. He was diagnosed as CCSH incidentally (**Table 1**). His cranial MRI revealed 10×5×2 cm CCSH at right subdural area (**Figure 2**).

We performed a wide craniotomy and duratomy including the whole of CCSH reaching dural arachnoid border and we dissected the calcified mass from arachnoid and invaginations to the brain in both of the patients. We paid attention not to injure arachnoid.

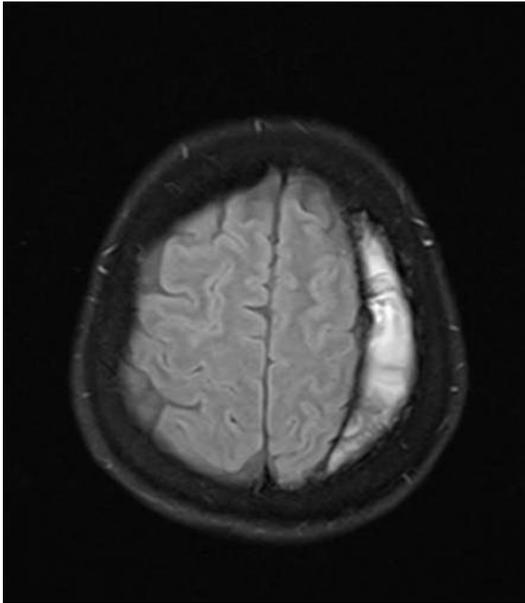
In both of the patients the masses was resected totally in form of small pieces by rongeur (**Figure 3A-C**). Following the washing up of the cortex we applied closed drainage for 1 day. We applied antibiotic and antiepileptic to both of the patients in time of admission to the hospital. We recommended antiepileptic and elastic bandage for 1 month and to cease antibiotic therapy at the 7<sup>th</sup> day.

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**Table 1.** Age, gender, symptoms, neurological signs, trauma history, previous diseases, number of applied operations, finding of MRI were given

Patient	Age	Gender	CP	NS	HHT	NP	MRI T1 Weight
1	35	F	Epilepsy	Normal	No	No	Hyperintense left calcified chronic subdural hematoma
2	58	M	No	Bilateral primary optic atrophy	No	No	Hyperintense left calcified chronic subdural hematoma

CP (Clinical Presentation), NS (Neurological Signs), HHT (History of HeadTrauma), NP (Number of Previous Operations).



**Figure 1.** T1-weighted axial magnetic resonance image shows hyperintense left calcified chronic subdural hematoma, 1<sup>st</sup> case.

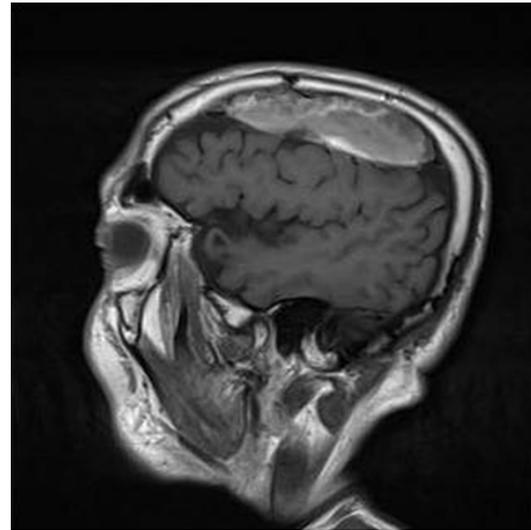
Neurological deficit did not develop and the patients were discharged at the 3rd day with recommendation of antiepileptic therapy.

### Discussion

CSH develops following minor head trauma and as seen in our patients most of the cases do not remember trauma. Because the process is slow due to cortical adaptation neurologic deficit does not develop even when the thickness of hematoma reaches to 2 cm. Our first case was diagnosed following epilepsy and the second incidentally.

Epilepsy develops in 22% calcification occurs in 0.3-2.7% of the cases with CSH. Most of them settle at the parietal area and near superior sagittal sinus [1, 6-9].

It has elliptical shape with thick inner membrane, none liquefied, and has sinusoidal blood



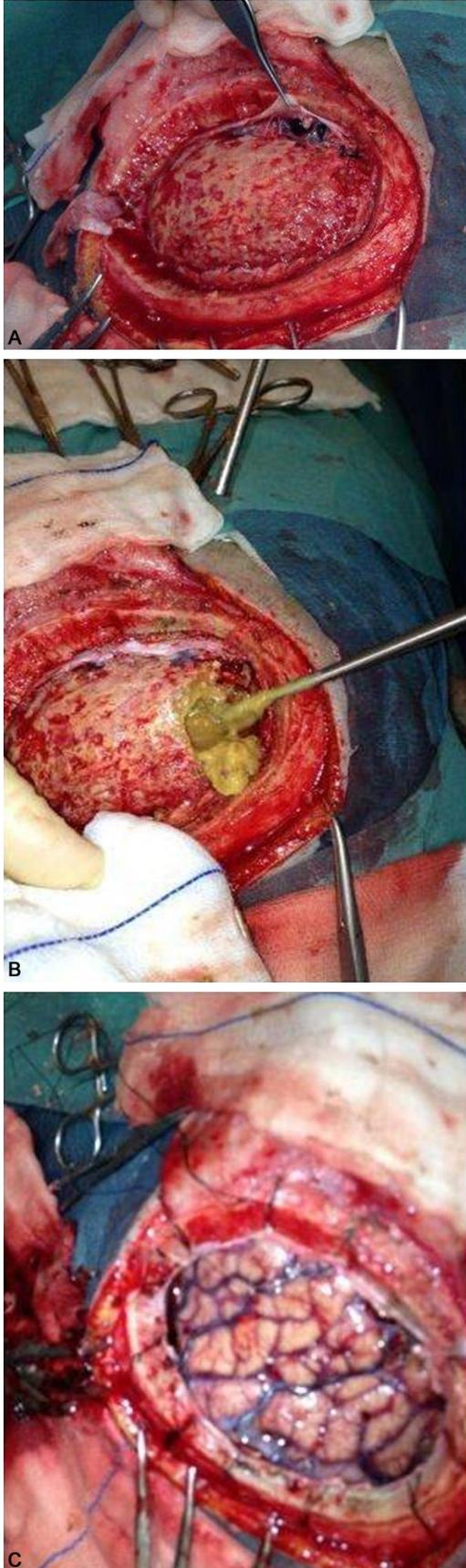
**Figure 2.** T1-weighted sagittal magnetic resonance image shows hyperintense left calcified chronic subdural hematoma, 2<sup>nd</sup> case.

vessels and partially adhere to arachnoid and invaginates into the cortex. Therefore we removed the mass totally in small pieces in order to preserve cortex. CCSH must be differentiated from calcified subdural empyema, calcified meningioma, calcified convexity dura, calcified arachnoid, histopathologic examination is required for definite diagnosis. In CSH calcification develops in 6 months, ossification occurs in a couple of years. Ossification of CSDH in our patients indicate that trauma occurred years ago and the patients forgot or disregarded the minor trauma [2, 3, 5, 7, 9].

Calcification of a tissue depends on the multiplication of extracellular  $Ca^{2+}$  and  $PO_4^{2-}$  amount when this multiplication  $3.4 \times 10^{-6}$  mol/liter  $Ca^{2+}$  and deposits as  $Ca^{2+}$  hydroxy phosphate occurs in all tissue, but calcification prevented by breakdown of phosphatase which exists in tissue *in vivo*.

If there is not a break down in calcium hydroxy phosphate it transforms in to calcium hydroxy apatite in 2-3 weeks and cannot be dissolved.

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**Figure 3.** A. After craniotomy (Intraoperative Picture), 1<sup>st</sup> case. B. Removing calcified hematoma, 1<sup>st</sup> case. C. After removed calcified hematoma, 1<sup>st</sup> case.

Therefore local factors, metabolic predisposition plays an important role in calcification [3-5, 7, 9, 10].

Inadequate nourishment of the capsule and the content results with calcification due to tissue necrosis and absence of phosphatase enzyme. It is reported that hemorrhage and calcification at the subdural area mostly occurs due to over drainage following ventriculoperitoneal shunt operation for hydrocephalus [2, 4, 5, 7, 8].

We did not observe deficit in both of our patients following operation and discharged them at the postoperative 3rd day with recommendation of antiepileptic.

### Disclosure of conflict of interest

None.

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### References

- [1] Ducruet AF, Grobelny BT, Zacharia BE, Hickman ZL, DeRosa PL, Anderson KN, Susman E, Carpenter A, Connolly ES Jr. The surgical management of chronic subdural hematoma. *Neurosurg Rev* 2012; 35: 155-169.
- [2] He X, Zang X. Giant calcified chronic subdural hematoma: a longterm complication of shunted hydrocephalus. *J Neurol Neurosurg Psychiatry* 2005; 76: 367.
- [3] Moon KS, Lee JK, Kim TS, Jung S, Kim JH, Kim SH Kang SS. Contralateral acute subdural hematoma occurring after removal of calcified chronic subdural hematoma. *J Clin Neurosci* 2007; 14: 283-286.
- [4] Yang ZH, Tseng HS, Chen Y Lin MS, Chen CJ. Calcified chronic subdural hematoma. *Tzu Chi Med J* 2004; 16: 261-265.
- [5] Yılmaz DM, Hacıyakupoğlu E, Hacıyakupoğlu S, Polat S, Özgür H, Sencar L, Dağlıoğlu, K. Effects of sodium selenite and amiloride on calvarial calcification in closing small cranial defects. *J Neurosur* 2011; 114: 478-484.
- [6] Gotoh M, Tsuno K, Handa A, Nishiura T, Ishimitsu H, Nishida A. Extraaxial primary malignant

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- lymphoma associated with calcified chronic subdural hematoma: a case report. *Neurol Surg* 2001; 29: 259-264.
- [7] Ide M, Jimbo M, Yamamoto M, Umebara Y, Hagiwara S. Asymptomatic calcified chronic subdural hematoma-report of three cases. *Neurol Med Chir* 1993; 33: 559-563.
- [8] Per H, Gümüş H, Tucer B, Akgün H, Kurtsoy A, Kumandaş S. Calcified chronic subdural hematoma mimicking calvarial mass: a case report. *Brain Dev* 2006; 28: 607-609.
- [9] Rahman A, Haque M, Bhandari PB. Calcified chronic subdural hematoma. *BMJ Case Reports* 2012; 5499.
- [10] Kaplan M, Akgün B, Seçer IH. Ossified chronic subdural hematoma with armored brain. *Turkish Neurosurgery* 2008; 18: 420-424.