Interdisciplinary Neurosurgery: Advanced Techniques and Case Management 25 (2021) 101171

Contents lists available at ScienceDirect

Interdisciplinary Neurosurgery: Advanced Techniques and Case Management

journal homepage: www.elsevier.com/locate/inat

Case Reports & Case Series

Calcified chronic subdural hematoma in two young men: Two cases in Dr. Soetomo General Academic Hospital Indonesia

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ARTICLE INFO

Keywords:
Calcification in chronic subdural hematoma (CSDH)
Hydrocephalus ex vacuo
Armoured brain syndrome
Matrioska

ABSTRACT

Background: Calcified Chronic Subdural Hematomas (CSDH) are uncommon variants of chronic SDH. Clinical manifestation is presented with various symptoms such as seizures, neurological deficits, or even increased intracranial pressure. Otherwise, it may become asymptomatic. The prevalence oftenly affects young male and is related to shunt positioning. However, there is still some controversy about whether the cases should be done by surgical intervention or not. Recovery condition can be accomplished by implementing satisfactory management suitable for the patient.

Case report: We reported 2 cases of calcified chronic subdural hematoma. First case, male, 20-year-old, was diagnosed with hydrocephalus ex vacuo and calcified chronic SDH in the frontotemporoparietal region bilaterally. He received non-surgical treatment. Second case, a male, 18-year-old, experienced seizure involving both body and extremities one day ago with history of VP shunt placement 14 years ago and was diagnosed with hydrocephalus ex vacuo and calcified chronic SDH in the right frontoparietal region. He was eventually treated conservatively without surgical intervention. There was no complication after served with non-operative treatment reported on both cases.

Conclusion: Conservative treatments of calcification in chronic subdural haematoma (CSDH) with hydrocephalus ex vacuo and regular observation during hospitalization demonstrated good clinical outcomes.

1. Background

It is known that the definition of calcification in chronic subdural haematoma (CSDH) is uncommon and occurs in about 0.3% – 2.7% cases of CSDH [2–4]. Calcified CSDH is also described as an armoured brain or Matrioska head [5], one of the rare complications following shunt overdrainage [3]. Salunke et al reported that Calcified CSDH occurs in a young man who became symptomatic eleven years after a shunt surgery. These reports highlighted the clinical presentation in a child with ventriculo-peritoneal shunt blockage whose symptoms were initially thought to be worse due to bilateral calcified chronic subdural collection. Another report showed that the cases have been reported in which calcified subdural haematoma had presented with symptoms of raised intracranial pressure or had been asymptomatic and were only an incidental radiologic finding [3,4]. Armoured brain syndrome is a described entity, where in the calcified subdural collections, it prevents the expansion of the brain despite its drainage. The treatment for such cases has been being performed with the craniotomies and drilling of calcified membranes which have risks to the underlying brain [6].

However, shunt revision is a simpler procedure with lesser morbidity. To conclude, one should consider shunt/shunt revision in the cases of armoured brain syndrome especially in patients who were asymptomatic for years together and suddenly becomes symptomatic [2].

2. Case report

The first case was a 20-year-old man who admitted to the emergency unit complaining a lump, gradually increased in size, in the right side of his neck for the last 6 months, before arriving at hospital. The lump is fixed and solid when palpated. The patient also complained difficulty in walking for roughly 2 months, in which he needed to hold the wall to be kept balanced. There was no vomiting, seizure, or decreased of consciousness. There was no fever for more than 3 weeks. Otherwise, the patient had been suffering from cough for the last 3 weeks. He also underwent VP shunt placement 15 years ago and never consulted to any

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https://doi.org/10.1016/j.inat.2021.101171
Received 19 October 2020; Received in revised form 16 February 2021; Accepted 28 February 2021
Available online 10 March 2021

physicians or neurosurgeons since it is placed.

Based on physical examination and neurological status, it is found that the general status was good with normal limit of vital signs. According to the local examination in the neck, soft tissue mass with partially solid form was evaluated, disconnected shunt at the right side of his neck was confirmed by palpation. There was no abdominal distention or any abnormal signs. From the neurological findings, it is found that the patient was conscious with a GCS score of 15 and without any significant neurological deficits. Skull and cervical spine x-ray presented that there was shunt malfunction in the neck region at the C7 vertebral body level (Fig. 1). CT scan with contrast showed hydrocephalus ex vacuo with calcified chronic SDH in the frontotemporoparietal region bilaterally (Fig. 2). Based on chest x-ray, it is confirmed that there was inhomogenous opacity in the apical part of the right lung (Fig. 3) impressing a tuberculosis or corona virus disease. Furthermore, the patient was evaluated by PCR/swab test with negative result. Besides, the patient suffered anemia (Hb level: 7,6 gr/dl). After revising the malfunctioned shunt whilst managing the extracranial problems, the symptoms of walking disorder and cough gradually disappeared with normal neurological status. Finally, the patient was treated conservatively without CSDH evacuation procedure since the clinical condition showed a significant improvement.

In another case, an 18-year-old man was admitted to the emergency unit after suffering from seizure one day ago. The frequency of seizure was once for approximately 2 min, both affecting the body and involving jerking movements of the arms and legs. The patient was recovered after experiencing seizure. There was no fever, vomiting, or decreased of consciousness. The history of chronic cough and weight loss was not found. There was a history of VP shunt placement 14 years ago. The patient consumed anti-seizure drugs since he was 4 years old. Based on physical examination and neurological status, it is found that the general status was good and the vital signs were stable. During the neurological exams, the patient was conscious with a GCS score of 15 without any significant neurological deficits. Post-operative scar was seen in the subcostal region. Normal chest x-ray was confirmed (Fig. 3) while CT-scan with contrast exam showed hydrocephalus ex vacuo and calcified chronic SDH in the right frontoparietal region which had eventually become a hygroma (Figs. 4 and 5). During hospitalization, there was no seizure and the patient was planned to be treated conservatively since the clinical condition and neurological status demonstrated normal findings.

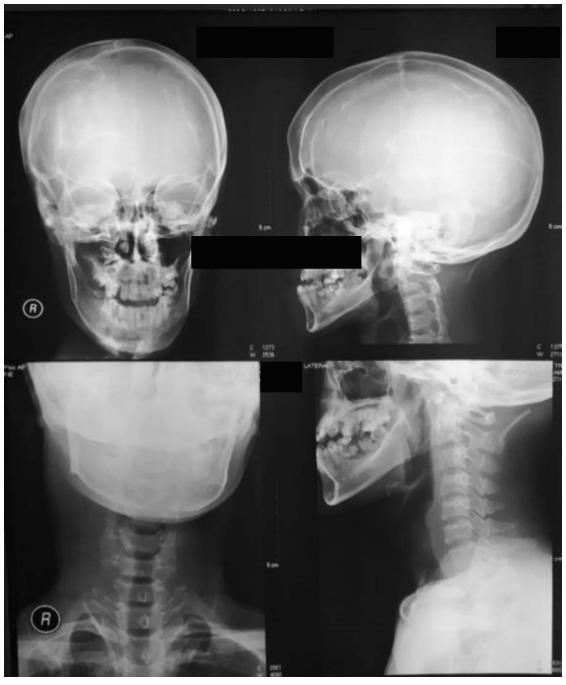

Fig. 1. Dysfunction of the shunt in the neck region at C7 segment level on skull and cervical spine x-ray.

3. Discussion

Calcification in a traumatic subdural haematoma is more commonly seen than the subdural collections of post-meningitis sequelae and ventriculoperitoneal shunts [2]. It is more frequently seen in children, though it has been described in all age groups. The time interval for the development of calcification following hematoma formation has been reported to vary from six months to many years [2]. The pathogenesis of calcification in CSDH is not very well understood. Dense collagen depositions occur on the membranes forming fibrotic capsule which eventually calcifies due to progressive mineralization [3]. Another study argued that the pathomechanism of calcification involves inadequate circulation and lack of absorption in the subdural cavity accompanied by thrombosis in the bloodstream [7–9], clotting blood in the subdural cavity, poor circulation caused by imbalance of supply from arterial vessel and poor venous return, thick layers of connective tissue, and many other factors argued affecting the progression of calcified chronic SDH [10]. Furthermore, calcification can be demonstrated in either unilateral or bilateral chronic subdural hematomas.

Cone of the most frequent problems encountered in neurosurgical practice, but its calcification or ossification has been rarely published in the literature. Although the exact incidence of calcified or ossified CSDHs is unknown, it has been reported to range from 0.3 to 10%. The calcified or ossified CSDHs due to various etiologies occur more frequently in children and young adults than the older ones [10]. Clinical manifestation can be presented as seizures, headache, memory deficit, disbalanced movement in walking, or deficit in the level of consciousness [11].

Some researchers argue that calcified subdural hematoma will not expand more and cause atrophy of the brain. From that view, evacuation of a calcified SDH will not offer much benefit. Meanwhile, Mori et al studied that expanding lesion of CSDH was noticed in a child aged 5 years old [12].

Systematic review studied by Turgut et al. [1] showed that there were 78 men and 29 women (7 with unreported gender) from 25 countries, ages ranging from 4 months to 86 years (mean 33.7 years), with etiologies of head trauma in 33.3%, shunting for hydrocephalus in 27.2%, or following cranial surgery in 4.4%. The duration of symptoms ranged from acute onset to 20 years, with a mean of 24.1 months. Imaging techniques such as X-ray, computed tomography, and magnetic resonance imaging were used with pathological confirmation of CSDH and a complete recovery in 56.4% of patients. And they concluded that the incidence of calcified or ossified CSDH was high in certain countries, including USA, Japan and Turkey, with a steady increase in recent years. Therapy of choice is surgery in these patients and it should be considered in the differential diagnosis at the time when we encounter because of its infrequency and variable clinical manifestation, following shunting in children or head trauma in adults. Hence, surgical management is preferred for expanding calcified chronic SDH. Evacuation of the hematoma not only decreases the side effect of the compression and inflammation but also stabilize the cerebral blood flow leading to recovery of neurological status [9,10,13].

Regarding to the first case we reported, the reason for malfunction of shunt could be happened because of several conditions such as traumatic accident, stretching related to a patient's growth, or even local flexion or extension of the neck muscles [14–17]. The utilities of shunt repositions may need time ranging from 6 months until roughly 20 years after placing the shunt [18–21].

Arguably, the membranes may be drilled out and the brain may expand. However, shunt revision is a simpler procedure with lesser morbidity. To conclude, one should consider shunt/shunt revision in the

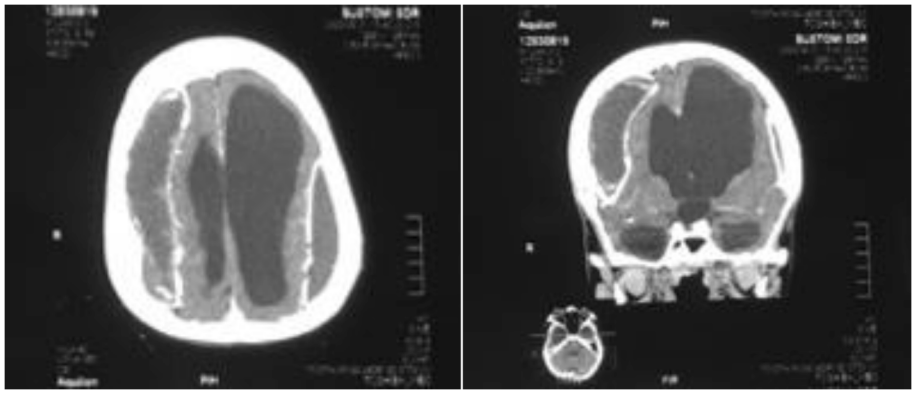

Fig. 2. CT scan with contrast demonstrated hydrocephalus ex vacuo with CSDH in the bilateral FTP regions.

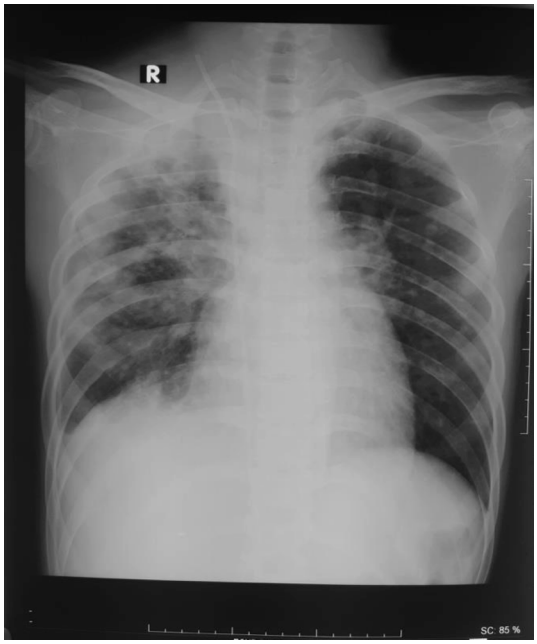

Fig. 3. Inhomogenous opacity was seen in the apical part of the right hemithorax x-ray impressing a pulmonary tuberculosis or corona virus disease.

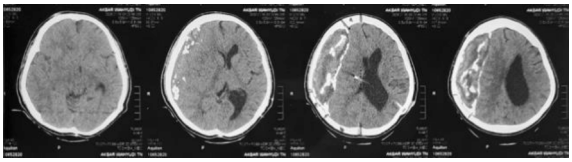

Fig. 4. CT scan with contrast presented hydrocephalus ex vacuo and CSDH in the right frontoparietal lobe.

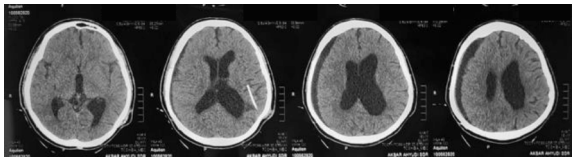

Fig. 5. CSDH transformed into a hygroma.

cases of armoured brain syndrome especially in patients who were asymptomatic for years together and suddenly becomes symptomatic. The more extensive procedure of drilling the membranes should be considered only in those patients who fail to respond to shunt or its revision [2]. In some cases where the calcification are solid, organized multiloculated, and extensive, endoscopic approach for direct visualization and removal may be necessary. Aside from its reported safety, this approach may allow identification and destruction of neomembranes [22].

4. Conclusion

Calcification in chronic subdural hematoma (CSDH) is a very rare case which commonly leads to an armoured brain syndrome. Even though surgery intervention generally become a chosen treatment for CSDH with hydrocephalus ex vacuo, the non-surgical procedures sometimes are able to be performed resulting good outcomes, especially when the extracranial problems are managed carefully.

5. Disclosure

The authors declare no conflict of interest regarding this study.

6. Statement of Ethical Principles for Medical Research Involving Human Subjects

This study has obtained the consent directly from the patient and conforming to the Declaration of Helsinki.

7. Funding sources

This article received no specific funding from any funding agency in the public, commercial, or nonprofit sectors.

Acknowledgements

The completion of this paper could not have been possible without the support and assistance of seniors of the Faculty of Medicine, Universitas Airlangga and many others whose names cannot be mentioned one by one.

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