Asymptomatic chronic ossified epidural hematoma in a child: a rare entity

Kronik ossifiye (kemikleşmiş) semptom vermeyen epidural hematomlu bir çocuk: Nadir bir antite

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A 6-year-old boy presented with an asymptomatic ossified chronic epidural hematoma. He was neurologically intact and had no complaints. This is the first report with a computed tomography image of cerebral compression due to an asymptomatic ossified epidural hematoma. Computed tomography indicated an ossified epidural hematoma in the left frontal region. In children, surgery for asymptomatic ossified chronic epidural hematoma with significant cerebral compression should be considered to relieve cerebral compression and prevent possible future brain damage.

Key Words: Child; hematoma, epidural, cranial/radiography/surgery; tomography, X-ray computed; ossification, heterotopic/diagnosis.

Bu yazıda, kronik, kemikleşmiş epidural hematomu olan altı yaşında bir olgu sunuldu. Hastanın herhangi bir şikayeti yoktu ve nörolojik muayenesi normaldi. Sunulan olgu, kronik kemikleşmiş bir epidural hematomda, bilgisayarlı beyin tomografisinde belirgin beyin basısı saptanmasına rağmen hiçbir klinik bulgu görülmemesi açısından önem taşımaktadır. Hastaya, beyin basısı nedeniyle ileride oluşabilecek hasarı önlemek için koruyucu dekompresif cerrahi uygulandı.

Anahtar Sözcükler: Çocuk; epidural hematom, kraniyal/radyografi/cerrahi; tomografi, X-ışını kompüterize; kemikleşme, heterotopi/tanı.

Chronic ossified epidural hematomas are rare clinical entities.[1-9] Epidural hematoma (EDH) in children is known to ossify, and this condition may prevent natural absorption of EDH. Therefore, careful follow-up seems to be mandatory when children with EDHs are treated conservatively.[1-3] EDH in children who have good neurological status is followed by computed tomography. However, the precise mechanism of calcification of an EDH is not well known.

We present a 6-year-old boy who had had a head trauma 21 days prior to admission and had an operation immediately because of potential complications such as seizure and enlargement.

CASE REPORT

A 6-year-old boy who had a head injury 3 weeks ago had no complaints. He had an unremarkable history except for the fall. He had no metabolic, endocrinologic, or systemic diseases. Neurologic examination and the results of laboratory analyses were normal. There was no fracture on plain radiography of the skull. The cranial computed tomography (CT) showed a left frontal ossified EDH. There was no traumatic lesion on CT, as well. An ossified hematoma is thick hyperdense layer along the inner border.

We performed a left frontal craniotomy. At surgery, we encountered a hard, osseous tissue that

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was 7 mm in thickness and that entirely adhered to the dura mater. It did not have a capsule, and upon superficial dissection it was removed with dura mater. Unfortunately, the specimen could not be examined pathologically.

DISCUSSION

Since 1994, EDHs with calcification have been published as isolated cases.[1-10] There are a few cases with acute asymptomatic EDH without ossification.[10,11] A literature review did not reveal any cases with asymptomatic chronic EDH presenting 3 weeks after a head injury. Kawata et al.[5] reported 2 pediatric cases with rapid ossification of an EDH, 4 months and 12 days after head injury, respectively. Nagane et al.[4] reported an ossifying and calcifying EDH that was detected 40 years after a head injury. Although children with a nonsurgical EDH present in a similar manner when compared with adults, critical neurologic evaluation is more important in children.

If the patient's neurologic status is not good, expansion of the hematoma or lack of resolution causing a mass effect should be kept in mind. EDHs in children require very careful observation, because some pediatric cases require emergency craniotomy due to large EDH or seizure.[3-6]

Although the precise mechanism of an osseous transformation is still not well understood, we know that damage to vascularized tissues such as bone and dura mater provokes and initiates a tissue response, including inflammation, repair and remodeling.[7,8,10] This natural sequence of healing is more rapid in children than in adults, mainly depending on the type and site of injury and the patient's age and metabolic status. Although skull growth ceases at the age of 7 years, diploe appears by 4th year and reaches maximum by age 35 years.[11] Our case had no metabolic bone disease or endocrinologic disorder. Expansion of an EDH may result from repeated bleeding of the inner table of the skull.[6] Extended studies to assess hereditary coagulation disorder, including protein S and C deficiencies, factor V Leiden mutation and antithrombin III deficiency were all normal.[8]

A characteristic intracranial "double-outlined" contour on plain skull radiographs and CT scans represented bone formation and calcification of the hematoma capsule adjacent to the dura.[9] The

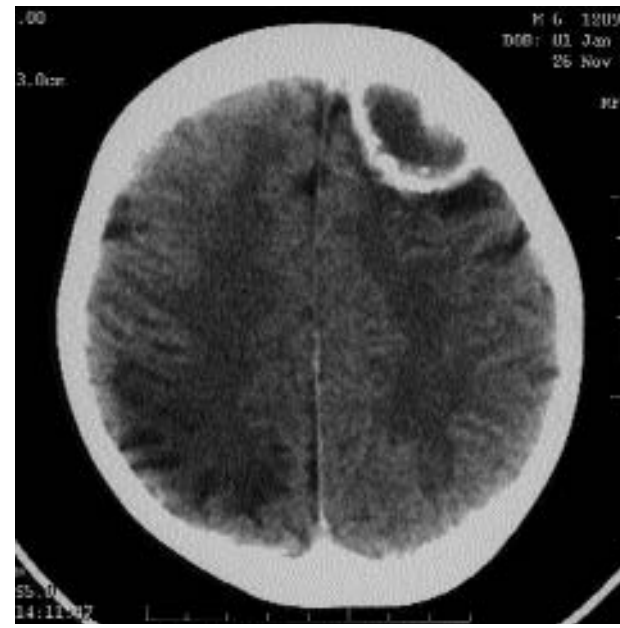

Fig. 1. The cranial axial CT showing a left frontal EDH with a hyperdense thick layer and ossificated.

hematoma was in the left frontal region and did not cause any shift effect (Fig. 1). Extirpated calcified EDH was 4.0x3.5 cm and 2.5 cm in thickness. We performed unilateral frontal osteoblastic craniotomy and found an ossified layer of tissue that firmly adhered to the underlying dura mater. Although some authors presume that the ossification starts at the junction between the dura and the hematoma capsule,[4,7] there was no capsule under the hematoma in our case.

In conclusion, EDHs may be asymptomatic and chronic. Therefore, these clinical entities should be considered in children with head injuries. If there is a chronic EDH with ossification, we strongly recommend surgery in these asymptomatic cases.

REFERENCES

1. Pang D, Horton JA, Herron JM, Wilberger JE Jr, Vries JK. Nonsurgical management of extradural hematomas in children. J Neurosurg 1983;59:958-71.
2. Raimondi AJ. Trauma. In: Raimondi AJ, editor. Pediatric Neurosurgery. 3rd ed. New York: Springer; 1987. p. 343-77.
3. Bejjani GK, Donahue DJ, Rusin J, Broemeling LD. Radiological and clinical criteria for the management of epidural hematomas in children. Pediatr Neurosurg 1996;25:302-8.
4. Nagane M, Oyama H, Shibui S, Nomura K, Nakanishi Y, Kamiya M. Ossified and calcified epidural hematoma incidentally found 40 years after head injury: case report.

Surg Neurol 1994;42:65-9.
5. Kawata Y, Kunimoto M, Sako K, Hashimoto M, Suzuki N, Ohgami S, et al. Ossified epidural hematomas: report of two cases. [Article in Japanese] No Shinkei Geka 1994;22:51-4.
6. Mathuriya SN, Kak VK, Banerjee AK. Ossified epidural haematoma. Report of two cases. Clin Neurol Neurosurg 1989;91:269-72.
7. Iwakuma T, Brunngraber CV. Extradural ossification following an extradural hematoma. Case report. J Neurosurg 1974;41:104-6.
8. Erdogan B, Sen O, Bal N, Cekinmez M, Altinors N. Rapidly calcifying and ossifying epidural hematoma. Pediatr Neurosurg 2003;39:208-11.
9. Cambria S, Marra GA, Di Perri R, Bramanti P. Ossified epidural hematoma. Report of a case with epilepsy. J Neurosurg Sci 1985;29:285-8.
10. Bor-Seng-Shu E, Aguiar PH, Matushita H, Manreza LA, Ferreira AA. Actual asymptomatic epidural hematomas in childhood. Report of three cases. Childs Nerv Syst 1997;13:605-7.
11. Knuckey NW, Gelbard S, Epstein MH. The management of "asymptomatic" epidural hematomas. A prospective study. J Neurosurg 1989;70:392-6.