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Case Report

Spontaneous Resolution of Calcified Cephalhematomas of Infancy: Report of Two Cases

Infantil Dönemde Kalsifiye Sefalhematomların Spontan Rezolüsyonu: İki Olgu Sunumu

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ABSTRACT

Cephalhematoma (CH) is less commonly encountered problem of infancy with an incidence of 1 % however calcified CHs are seldom. The exact reason of calcification remains unclear. We report two cases of calcified CHs that developed as a complication of vacuum extraction during vaginal delivery. Calcified CHs generally present with cosmetic reasons like skull asymmetry and calvarial mass. Although Doppler ultrasonography is useful in the diagnosis of CHs, computerized tomography or direct X-rays help more in the detection of calcified ones. Follow-up should be considered for cases below 2 years of age since the cranium continues to grow and there appears to be a chance of spontaneous resolution. Surgical intervention should be reserved for cases with neurological deficits or persistent lesions on follow-up.

KEYWORDS: Cephalhematoma, Calcification, Vacuum extraction, Vaginal delivery, Infant

ÖZ

Sefalhematom infantil dönemde daha az sıklıkla karşılaşılan bir problem olup insidansı %1 civarındadır oysa kalsifiye sefalhematomlar oldukça nadirdir. Kalsifiye olmalarının tam olarak nedeni belirlenememiştir. Burada iki kalsifiye sefalhematom olgusu sunulmakta olup her iki olguda da vajinal doğum sırasında vakum kullanılmıştır. Kalsifiye sefalhematomlar sıklıkla kranium asimetrisi ve kalvaryum kitlesi gibi problemlerle prezente olur. Doppler ultrasonografinin tanıda yardımcı bir yöntem olduğu bilinmesine karşın, Bilgisayarlı Tomografi ve direkt grafiler kalsifiye olguların tanısında daha çok yardımcıdır. İki yaş altında olgularda takip önemlidir çünkü kranium büyümeye devam eder ve lezyonun spontan kaybolması şansı vardır. Cerrahi tedavi seçeneği özellikle nörolojik defisiti olan veya takip edilmelerine karşın sebat eden lezyonlar için saklanmalıdır.

ANAHTAR SÖZCÜKLER: Sefalhematom, Kalsifikasyon, Vakum kullanımı, Vajinal doğum, İnfantil dönem

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INTRODUCTION

Cephalhematomas (CHs) are rare and usually benign subperiosteal collections of infancy which can calcify or show spontaneous resolution. These collections do not cross sutures and the midline which helps in their differentiation from caput succedaneum and subgaleal hematoma (4). At birth, CHs can be associated with more common use of vacuum extraction and forceps use during vaginal delivery (12). Despite the possibility of spontaneous regression particularly in infants, some cases have been operated for cosmetic reasons without any sign of mass effect (1). Here, we report two infants with calcified CHs that developed soon after normal vaginal delivery. This is a unique report pointing to spontaneous resolution of calcified CHs on follow-up CT scans without any surgical intervention.

REPORT of TWO CASES

Case 1

A 6-week-old male infant was referred to our clinic with a swelling on the left side of his head after birth. It was reported that biparietal scalp swelling developed soon after a normal vaginal delivery and there was also a history of forceps use and vacuum application. Physical examination revealed a compact osseous and non-fluctuating mass located over the left parietal bone without crossing suture lines. Skull X-rays revealed swelling and double-density appearance over the left parietal cranium without any fracture line. There was also no significant increase in density or any calcification. No neurological deficit was noted and the lesion was thought to be calcified CH. The lesion was about 4 centimeters in size. Axial CT images demonstrated subperiosteal osteogenesis over the hematoma resembling the separation of inner and outer tables encountered in intraosseous hematomas (Figure 1A). Heterogeneous signal intensities (iso-to hypointense) on T1-weighted magnetic resonance images (MRI) and hyperintense appearance of areas on T2 sequences (Figure 1B) which were previously hypointense on T1-weighted images are important characteristics and these were found to be consistent with a calcified cephalhematoma. Hematologic studies did not reveal any abnormality. There was also no subdural or epidural space-occupying lesion and no abnormality in the appearance of cerebral hemispheres. The patient was not operated during the second admission and he was just put on clinical and radiological follow-up. The lesion regressed and absorbed completely over the next 16 months. CT images were reobtained 18 months after birth and there was no detected abnormality of the cranium (Figure 1C).

Case 2

A 7-week-old infant was admitted with a complaint of firm mass on the right side of the head. The infant was subjected to vacuum extraction during normal vaginal delivery. It was reported that this mass was present and soft at birth but was getting harder within the last five weeks. Skull X-rays revealed calcified swelling and double-density appearance over the right parietal cranium (Figure 2A). The lesion was iso- to hypodense on axial CT images and calcification

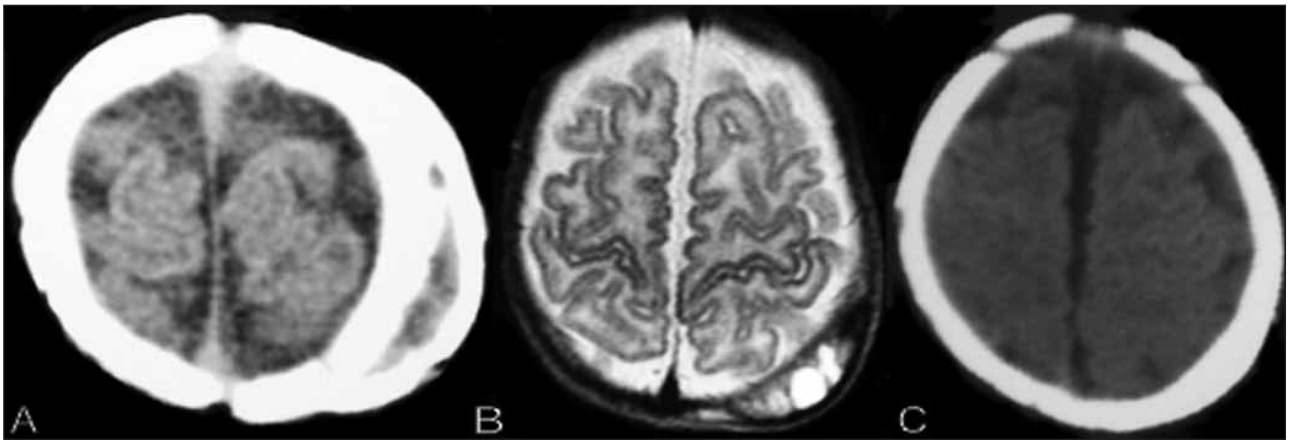

***Figure 1: A**. Axial tomographic image of the skull demonstrates a double-contour appearance on left parietal region. **B.** The lesion is iso- to hyperintense on axial T2-weighted images. **C.** Axial CT image of the same patient demonstrates complete disappearance of calcified cephalhematoma after 16 months.*

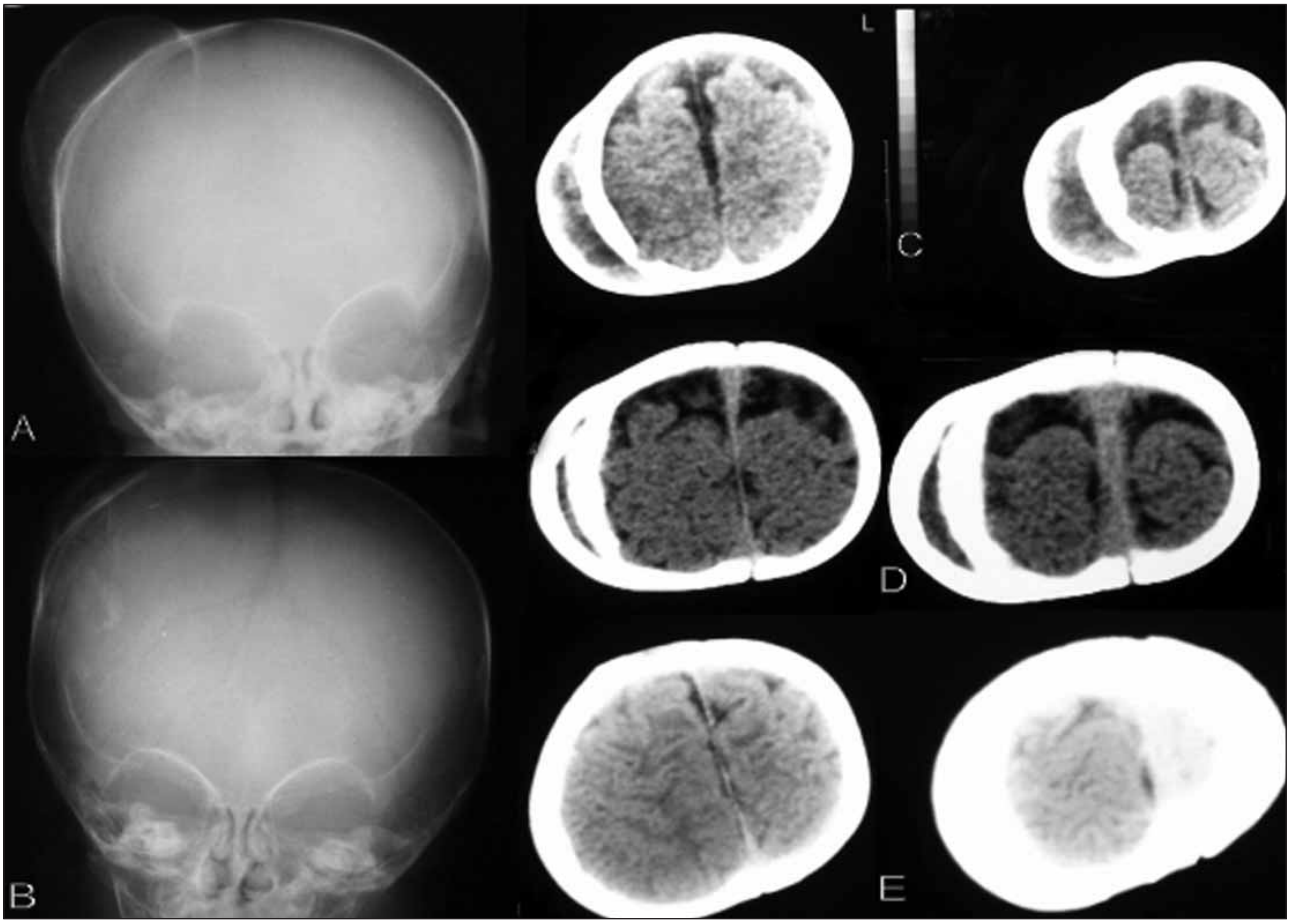

***Figure 2: A**. Anteroposterior X-ray of the skull shows soft tissue swelling, with no fracture line or a change in density. **B**. Skull x-ray of the same patient 10 months later. **C**. Axial tomographic image of the skull at the time of initial diagnosis of cephalhematoma. **D**. Partial resolution of the calcified hematoma 3 months after the initial diagnosis. **E**. Axial CT scan of the same patient demonstrates complete disappearance of the calcified cephalhematoma after 10 months.*

of cutaneous margins of CH resembled the separation of inner and outer tables of the skull (Figure 2C). No space-occupying lesions like subdural or epidural hematomas were noted. The patient was not operated and he was followed for 8 months. The lesion regressed and absorbed partially at the end of fourth month (Figure 2D). Direct X-ray and CT of the cranium were reobtained 12 months after birth and there was no detected abnormality of the cranium (Figure 2B, 2E).

DISCUSSION

The pathogenesis of CHs is unclear and frequently attributed to perinatal use of forceps or vacuum extraction for difficult vaginal delivery (12). In the present report, we suggest clinical follow-up of calcified CHs instead of surgical intervention. The periosteal layer over CHs can easily calcify, and these lesions may consequently be misdiagnosed as intraosseous lesions, particularly intraosseous hematomas (8,14). Arachnoid cysts, granulomatous lesions, meningoencephaloceles, and should also be included in the differential diagnosis of CHs (3,5,6,7). Radiological studies usually help in the differentiation of these entities unless biopsy is considered.

Cephalhematomas are collections of blood resulting from bleeding into subperiosteal layer that is usually limited by sutures of the skull. They may occasionally calcify and can cause bony swelling of cranium for several months although they usually resolve within weeks. On the other hand, subgaleal hematomas are more common because of the loose areolar tissue between the galea aponeurotica and the periosteum. They can easily dissect a large area over the skull and easily mimic depression fractures if palpated. Subgaleal collections can calcify unless they begin to get smaller within a few weeks. These

subgaleal collections should be followed cautiously with obstetricians or pediatricians since the minority of these cases may calcify. A calcified subgaleal hematoma is apt to be a matter of some concern to parents for cosmetic reasons and they could be removed surgically (2). In contrast to subgaleal hematomas, subperiosteal hematomas are often associated with linear fractures and limited with suture lines.

CT and MRI of the cranial vault as well as conventional plain graphics and tangential X-rays are valuable diagnostic tests to differentiate CHs from infantile intraosseous hematomas which are different lesions. CT scan of intraosseous hematomas demonstrate isodense areas however CHs demonstrate hypo- to hyperdense areas (8). When intraosseous hematomas are considered, MRI reveals hypointense signal on T1- and hyperintense signal on T2-weighted images however insufficient for differential diagnosis (10,11). Yucesoy et al operated a right parietal intraosseous hematoma for cosmetic reasons which developed after a long-lasting vaginal delivery (14). Reeves et al reported a 2-month-old infant with a right parietal lesion. Plain X-rays, cranial CT and MR images delineated an intraosseous hematoma which regressed greatly over 15 weeks of follow-up (9). Nevertheless there are intraosseous hematomas that may calcify intensely or exert a mass effect over cerebral tissue (13). In the present report, follow-up revealed complete disappearance of the lesions almost within a year.

The cranium is compact and osseous, however it is somewhat elastic and brain maturation is the main stimulant for the growth of this elastic cranium. The cases described in this unique report developed complete resorption of calcified CHs without any remaining bony abnormality on control CT scans. The main logical explanation of this spontaneous resolution is the growth tendency of the cranium under ossified subperiosteum which gradually fills the space between periosteum and cranium. On the other hand, calcification will not be present in cases having a quick metabolism or calcified CHs may disappear quickly in cases with increased resorption rate.

Surgical resection of CHs is performed usually for histopathological confirmation and cosmetic reasons. Despite various etiologies, clinical manifestations and radiological features could be quite beneficial to differentiate them from intraosseous lesions. Radiological follow-up should be considered for calcified cephalhematomas before planning a surgical intervention.

CONCLUSION

Given the rarity of calcified CHs, it is quite difficult to withdraw any conclusion regarding their clinical management. Nevertheless, we recommend follow-up for asymptomatic calcified CHs for at least a few months in the hope that they could disappear spontaneously without any cosmetic problems.

REFERENCES

1. Chung HY, Chung JY, Lee DG, Yang JD, Baik BS, Hwang SG, Cho BC: Surgical Treatment of Ossified Cephalhematoma. Journal of Craniofacial Surgery 15:774-779, 2004
2. Derek BA: Cephalhematoma and subgaleal hematoma. In: Wilkins RH, Reganchary SS, eds. Neurosurgery. New York: McGraw-Hill, 1996, 2739-2740
3. Garza-Mercado R, Cavazos E, Hernandez-Batrez F: Giant cell reparative granulomas of the cranial vault: Exceptional bone lesion. Neurosurgery 15:228-232, 1984
4. Gresham EL: Birth trauma. Pediatr Clin North Am 22:317-328, 1975
5. Halpin SFS, Brittion J, Wilkins P, Uttley D: Intradiploic meningiomas: A radiological study of two cases confirmed histologically. Neuroradiol 33:247-250, 1991
6. Hande AM, Karapurkar P: Hemorrhage into an intradiploic arachnoid cyst. J Neurosurg 75:969-971, 1991
7. Martinez-Lage JF, Lopez F, Piqueras C, Poza M: Iatrogenic intradiploic meningoencephalocele: Case report. J Neurosurg 87:468-471, 1997
8. Mobbs RJ, Gollapudi PR, Fuller JW, Dahlstrom JE, Chandran NK: Intradiploic hematoma after skull fracture: Case report and review of the literature. Surg Neurol 54:87-91, 2000
9. Reeves A, Edwards-Brown M: Intraosseous hematoma in a newborn with factor VIII deficiency. Am J Neuroradiol 21:308-309, 2000
10. Sato T, Kubota T, Kawano H: Chronic diploic hematoma of the parietal bone: case report. J Neurosurg 80:1112-1115, 1994
11. Uemura K, Tsubol K, Nose T: Intradiploic hematoma. AJNR Am J Neuroradiol 18:397-398, 1997
12. Wen SW, Liu S, Kramer MS, Marcoux S, Ohlsson A, Sauvé R, Liston R: Comparison of maternal and infant outcomes between vacuum extraction and forceps deliveries. Am J of Epidemiol 153:103-107, 2001
13. Yuasa H, Watanabe H, Uemura Y, Tokito S: Intraosseous hematoma of the skull: Case report. Neurosurgery 30:776-778, 1992
14. Yücesoy K, Mertol T, Özer H, Özer E: An infantile intraosseous hematoma of the skull. Childs Nerv Syst 15:69-72, 1999