Epidural Hematoma Associated with Cephalohematoma in a Neonate

—Case Report—

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Abstract

A female neonate presented with cephalohematoma over the temporoparietal region on the right side. Computed tomography (CT) revealed the presence of an underlying epidural hematoma (EDH) and associated skull fracture with communication between the hematomas. Aspiration of the cephalohematoma was followed by reduction in the size of the EDH. CT revealed cure without the need for an operative procedure. Aspiration is indicated for neonatal EDH with mild symptoms and liquefied cephalohematoma.

Key words: epidural hematoma, cephalohematoma, neonate

Introduction

Epidural hematoma (EDH) is rare in newborn infants compared with other types of intracranial hemorrhages,^{4,12,21)} whereas cephalohematoma is often encountered after birth.^{13,18,23)} The choice of treatment depends on the mechanism of bleeding.

We describe a neonate with EDH and cephalohematoma in the same region treated successfully by only aspiration of the cephalohematoma.

Case Report

A girl was born spontaneously after an uneventful pregnancy at 38 weeks of gestation. Her weight was 2800 g, height 46.2 cm, and head circumference 30.5 cm. She had a soft palpable mass over the temporoparietal area on the right side. Puncture of the mass on the 17th day of life revealed a hematoma that recurred a few days later. Computed tomography (CT) demonstrated an EDH in the vicinity of the cephalohematoma. She was referred to our hospital for possible treatment.

On admission, a plain skull x-ray film showed a linear fracture in the parietal region on the right side

(Fig. 1). The CT scan taken at the other hospital demonstrated an isodense lentiform mass in the parietal region on the right side that was interpreted as an EDH (Fig. 2). The subcutaneous hematoma was soft and non-pulsatile and had a diameter of 3.5 cm. Neurological and physical examinations revealed no abnormalities. Her appetite and temper were nor-

Fig. 1 Plain skull x-ray film demonstrating a linear fracture in the parietal region (arrow).

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Fig. 2 CT scan showing a cephalohematoma and an EDH (arrows) on the right side.

Fig. 3 Bone window CT scan revealing the communication (arrow) between the EDH and the cephalohematoma.

Table 1 EDH in neonates

Author (Year)	Sex	Delivery	Site of EDH	Skull fracture	Cephalohematoma/Communication*	Character of EDH	Therapy	Result	Other lesion
Takagi <i>et al.</i> (1978) ²¹⁾	M	forceps	bil F-T	no	yes/ND	liquid	removal	good	no
	M	forceps	lt F-T, rt F	yes	yes/ND	liquid, clot	removal	died	no
	F	forceps	rt F-T	yes	ND	ND	none	died	SDH
	M	breech	lt F-T	yes	ND	ND	none	died	SDH, IVH
	M	breech	PF	no	ND	ND	none	died	SAH
Merry and Stuart (1979) ¹⁵⁾	M	normal	lt P	no	no/ND	liquid, clot	removal	good	no
Hayashi <i>et al.</i> (1982) ¹⁰⁾	M	trauma	lt P	yes	no/ND	liquid	removal	good	no
	F	precipitate	lt P	yes	yes/ND	ND	none	good	no
	M	breech	lt T	no	yes/yes	liquid	removal	good	craniolacnia
Esparza <i>et al.</i> (1982) ²³⁾	M	forceps	PF	no	no/ND	clot	removal	good	no
Aoki (1983) ²⁴⁾	F	vacuum	lt P	yes	yes/yes	liquid	aspiration	good	no
Gama and Fenichel (1985) ⁶⁾	M	forceps	lt F-P	yes	yes/ND	ND	removal	good	no
Tada <i>et al.</i> (1986) ²⁰⁾	F	precipitate	rt P	yes	yes/yes	ND	removal	ND	no
Andoh <i>et al.</i> (1988) ¹¹⁾	M	forceps	rt F	no	no/ND	liquid	removal	good	no
	M	breech	rt P	no	yes/yes	liquid	removal	died	hydrocephalus, myelomeningocele
Negishi <i>et al.</i> (1989) ¹⁷⁾	M	normal	rt P	yes	yes/yes	liquid	aspiration	good	no
	M	normal	rt P	yes	yes/yes	liquid	aspiration	good	no
	M	forceps	lt F-P	yes	yes/yes	liquid	aspiration	good	no
	M	breech	bil P	no	yes/ND	ND	none	good	DIC, IVH, ICH
Wakayama <i>et al.</i> (1991) ²²⁾	F	forceps	rt F, rt P, lt T-P	yes	yes/ND	liquid, clot	removal	good	SAH
	F	vacuum	lt P	yes	yes/ND	liquid, clot	removal	good	no
Okuno <i>et al.</i> (1993) ¹⁹⁾	F	vacuum	lt P	no	yes/no	liquid	removal	good	no
Present case	M	normal	lt P	yes	yes/yes	liquid	aspiration	good	no

*Communication between the cephalohematoma and the EDH. DIC: disseminated intravascular coagulation, F: frontal, ICH: intracerebral hemorrhage, IVH: intraventricular hemorrhage, ND: not described, P: parietal, PF: posterior fossa, SAH: subarachnoid hemorrhage, SDH: subdural hemorrhage, T: temporal.

mal. Laboratory examinations including hematology, blood chemistry, coagulation, and urinalysis were all normal except for a slightly increased serum bilirubin level.

The cephalohematoma disappeared on the 20th day of life. CT showed significant diminution of the EDH and a communication between the cephalohematoma and the EDH (Fig. 3). She was discharged from the hospital without direct intervention. She was followed up at an outpatient clinic. CT 3 months later showed complete disappearance of the EDH.

Discussion

Only 31 cases of EDH in neonates have been reported.^{1-11,14-17,19-22} Takagi *et al.*²¹ found EDH in only three (2.2%) of 134 autopsied infants who developed intracranial hemorrhages within the first 14 days of life. We analyzed the clinical characteristics of the 23 cases with detailed descriptions including ours (Table 1). The male:female ratio was 16:7. The supratentorial region was involved in 21 cases and the infratentorial region in the other two. Four infants had bilateral and/or multiple lesions. Possible causative events included mechanical aid (forceps 8, vacuum 3), breech presentation (5), precipitate delivery (2), and post-delivery head injury (1). In four cases, the delivery was normal. Skull fracture was identified in 14 cases. The EDH was associated with cephalohematoma in 16 of 20 cases with a clear description. Eight of the 16 cases had communication between the cephalohematoma and the EDH, one case had no communication, and the other seven cases had no clear documentation. Five of the 23 patients died, but the others had good outcomes.

Five infants with EDH complicated by cephalohematoma were cured by aspiration only.^{2,17} Negishi *et al.*¹⁷ reported three moderate cases with this outcome and stressed the utility of aspirating the cephalohematoma before considering surgical intervention. Wakayama *et al.*²² described two infants with multiple and massive EDH, and pointed out the necessity for urgent operation in such cases. In contrast, Aoki² suggested the possibility of spontaneous resolution of EDH in an infant with skull fracture even without aspirating the cephalohematoma. However, Okuno *et al.*¹⁹ reported that aspiration was ineffective in their patient.

The etiology of EDH is probably arterial bleeding in patients such as those reported by Wakayama *et al.*,²² in which an emergency operation was definitely indicated. However, other causes of bleeding need to be considered in patients like ours. In general, rup-

ture of the middle meningeal artery is the main cause of EDH in adults. However, there is usually no clear fracture or bleeding point observed during operation in neonates.^{5,9,15,21} In neonates with less severe symptoms, venous bleeding may be a factor in provoking EDH.^{6,17,21} Venous bleeding may be caused by separation of the dura from the inner table due to molding of the skull.^{14,21} In our patient, the bleeding was assumed to originate from the surface of the dura, skull, and bone marrow of the fractured skull because the symptoms were subacute and rather mild. The adaptability of the soft neonate skull is thought to be a key factor in this mechanism.^{14,21}

Aspiration should be attempted in neonatal EDH complicated by liquefied cephalohematoma with mild symptoms. Good clinical status and non-aggravating findings on repeated CT scans are mandatory for observation. However, if aspiration turns out to be ineffective, surgical procedures should be used.

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