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Case Report

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Neonatal Acute Epidural Hematoma: A Case Report and Literature Review

Arad Iranmehr, Milad Rashidbeygi, Mohammad Namvar, Ayda Khadivi, Ehsan Hoseynzadeh, and Abolfazl Payinmahalli

Tehran University of Medical Sciences (TUMS), Tehran, Iran

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Address for correspondence:
Arad Iranmehr
Tehran University of Medical Sciences (TUMS), Ghods St., Keshavarz Blvd., Tehran 14155-5583, Iran.
E-mail: Arad.Iranmehr@gmail.com

ORCID iDs
Arad Iranmehr
https://orcid.org/0000-0002-5932-9375

Conflict of Interest
The authors have no financial conflicts of interest.

ABSTRACT

We present a rare case of an acute epidural hematoma (EDH) in a neonate. The EDH was caused by a fall during natural vaginal delivery. The clinical findings were normal after fall and the first ultrasonographic study did not show any hematomas. A computed tomography scan on the second day after delivery showed an EDH with 20 mm thickness extending through a skull fracture into subgaleal space. We performed a craniotomy and removed the EDH and subgaleal hematoma. After the surgery we performed follow-up twice ultrasonographic study for seeking probable hematoma recurrence. The patient was discharged after postoperative 3 days without any neurological deficits.

Keywords: Cranial epidural hematoma; Neonate; Birth injuries; Craniotomy

INTRODUCTION

Acute epidural hematoma (EDH) in neonates is a rare condition. This could be due to less developed meningeal arteries in neonates. There are only a few reported cases of neonatal acute EDH related to delivery.[5] Majority of these cases is generally related to difficult parturition with cephalic instrumental vaginal delivery in nulliparous women.[3,7] In this case we reported a multi par mother with a fast labour, which caused falling of the neonate.

There is a controversy in management of acute EDH in neonates. Three management strategies have been introduced in literature. A classic surgical evacuation of the hematoma is the most used strategy in this condition. Some papers reported successful removal of the hematoma with endoscopic procedure.[5] There are also reports of successful evacuation of the hematoma with needle aspiration in the literature.[8] We removed the hematoma with a craniotomy due to remarkable size of hematoma.

CASE REPORT

This 2,850 g male infant was born to 34-year-old gravida 3, para 3 women at 39 weeks of pregnancy. The mother received prenatal care. There were no remarkable pregnancy complications and she had a normal ultrasound study at 26 weeks gestation. Her previous

deliveries resulted in term, healthy newborns who all delivered vaginally after a short labor. Mother previously suffered from a thyroid cancer and tracheostomy was performed to her 3 years before the last pregnancy. On the day of delivery, labor began spontaneously. Due to discomfort mother was out of bed and the rupture of membranes occurred while the patient was standing at the bedside, which was immediately followed by the precipitous, vertex delivery of her infant. The neonate fell down approximately 70 cm to the floor. Apgar scores were 9 and 10 at 1 and 5 minutes after the birth respectively. There was no remarkable problem in physical examination after birth except a right temporoparietal bruise. An emergency ultrasound performed after the birth that did not show any hematoma. Twelve hours after birth the second ultrasound was performed due to remarkable subgaleal hematoma on physical examination. The second ultrasound examination revealed a subgaleal hematoma with a 17×33 mm EDH. Emergency head computed tomography (CT) scan was performed. The head CT revealed a massive parietal EDH with 20 mm thickness and a linear parietal skull fracture (**FIGURE 1**). The patient was transported to operating room immediately. Skin incision was done by the 5 cm inverted U-shaped under CT scan guide. To minimize blood loss from scalp, surgical clamps were used around the skin incision each 1–2 cm. The subgaleal hematoma and connected EDH were evacuated spontaneously due to high pressure. The craniotomy was done with a mosquito scissor. The clotted part of the EDH was evacuated with normal saline infusion after bone flap removal. Tack up sutures with 5-0 silk was performed around the craniotomy site in each centimeter (**FIGURE 2**). Central tack up suture was performed. The bone flap replaced and fixed with 4-0 nylon to the skull in 4 points. The skin was closed with simple running sutures. The blood loss was minimal. The patient transported to Neonatal Intensive Care Unit after the surgery. On first post-operative day we performed a control ultrasound study and there were no signs of hematoma. We repeated the ultrasound examination 3 days after surgery and the study revealed full evacuation of hematomas. He had no neurological deficits and discharged 4 days after surgery.

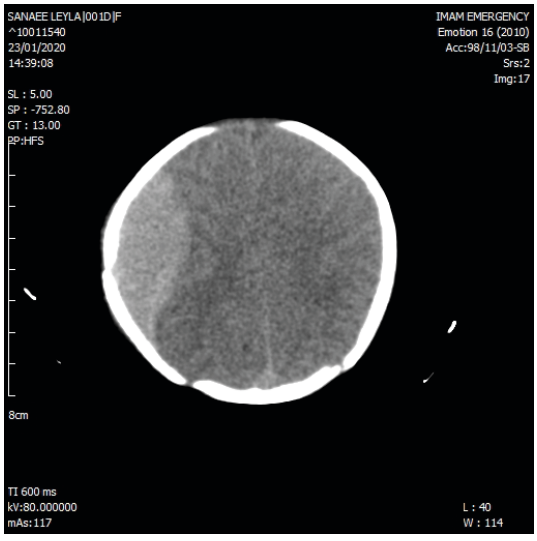

FIGURE 1. An acute epidural hematoma on pre-operation CT-scan.

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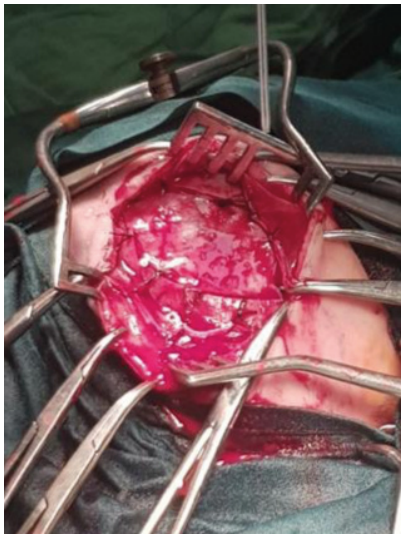

FIGURE 2. Acute epidural hematoma image during surgery.

DISCUSSION

The EDH in neonates is a rare condition. The EDH during birth trauma is usually related to difficult device assisted vaginal deliveries in nulliparous women. The cases of traumatic EDH due to fall during labor is extremely rare and often happen in fast vaginal deliveries in multiparous women.[2] Two studies in large U.S. hospital systems reported the neonatal in hospital fall incidence of 1.6–4.14 falls per 10,000 births. Only four falls reported in these studies which were during labor and none of them resulted an EDH.[3,5] Serious falls during deliveries are rare but it should be considered in multiparous women to prevent potential traumatic cerebral injuries.

There are multiple treatment procedures for neonatal EDH. There are reports of successful evacuation of EDH with needle aspiration and endoscopic surgery beside the classic craniotomy.[1,8] There is no evidence that any of these treatments is associated with better outcomes. Most of these patients did not experience severe neurologic deficits, recurrence or convulsive seizures. But because of rare occurrence, the level of evidence is low.[6] We chose craniotomy due to size of the hematoma and the risk of future calcification.[4] The presence of a depressed skull fracture is an important factor for choosing the treatment procedure.

In previous reported cases CT-scan was used as the post operation imaging modality. To minimize the X-ray radiation related damages, we used ultrasonography as the control imaging modality after the surgery. We repeated the ultrasound study three days after the surgery. Regarding to neonatal architecture of tissues in skull and sensitivity of neonatal tissue to X-ray, ultrasound may be a better modality for post operation control imaging.

CONCLUSION

The EDH in neonates is a rare condition. There are different procedures for treating neonatal EDH. In this case we used a classic craniotomy. Ultra-sonography could be an acceptable imaging modality for post-operation imaging.

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REFERENCES

1. Gregorio-Hernández R, González-Valcarcel M, Escobar-Izquierdo AB, López-Lozano Y, Cabada-Del Río A. Neonatal epidural haematoma. Presentation of 3 cases and a literature review. **An Pediatr (Barc) 88**:50-51, 2018
PUBMED | CROSSREF
2. Hamlat A, Heckly A, Adn M, Poulain P. Pathophysiology of intracranial epidural haematoma following birth. **Med Hypotheses 66**:371-374, 2006
PUBMED | CROSSREF
3. Helsley L, McDonald JV, Stewart VT. Addressing in-hospital "falls" of newborn infants. **Jt Comm J Qual Patient Saf 36**:327-333, 2010
PUBMED | CROSSREF
4. Kim Y, Jung JH, Kim DY, Seung WB, Park YS. Rapid ossification of epidural hematoma in a child: a case report. **Korean J Neurotrauma 10**:152-154, 2014
PUBMED | CROSSREF
5. Monson SA, Henry E, Lambert DK, Schmutz N, Christensen RD. In-hospital falls of newborn infants: data from a multihospital health care system. **Pediatrics 122**:e277-e280, 2008
PUBMED | CROSSREF
6. Nakatogawa H, Tanaka T, Inenaga C, Fujimoto A, Yamamoto T. Endoscopic removal of neonatal acute epidural hematoma via strip-bending osteoplastic craniotomy. Technical note. **J Neurol Surg A Cent Eur Neurosurg 76**:495-498, 2015
PUBMED | CROSSREF
7. Rabelo NN, Matushita H, Cardeal DD. Traumatic brain lesions in newborns. **Arq Neuropsiquiatr 75**:180-188, 2017
PUBMED | CROSSREF
8. Vachharajani A, Mathur A. Ultrasound-guided needle aspiration of cranial epidural hematoma in a neonate: treating a rare complication of vacuum extraction. **Am J Perinatol 19**:401-404, 2002
PUBMED | CROSSREF

https://doi.org/10.13004/kjnt.2020.16.e22