

Case Report: Adrenal Hemorrhage in the Deceased Neonate Referred to Tehran Legal Medicine Organization



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ABSTRACT

Adrenal hemorrhage during neonatal phase is more prevalent than was thought before and most of the cases are diagnosed after the autopsy. However massive hemorrhage is rare. The most important cause of adrenal hemorrhage is perinatal injuries, but large fetal size, maternal diabetes, congenital syphilis, anoxia, hemorrhagic diseases and immaturity are predisposing factors. Incidence rate of adrenal hemorrhage is 0.2% to 0.5% during perinatal phase. The diagnosis of the adrenal hemorrhage in this phase is rare. Our case was a four-day-old full term neonate who was born via normal vaginal delivery, with Apgar score 3. The baby was intubated immediately which was followed by seizure attacks and unfortunately death on the fourth day of life. The neonate was female with 3100 g weight. At autopsy the left kidney appeared larger than normal and the adrenal subcapsular hematoma which amounts to about 50 mL, was seen. According to previous studies delivery per vaginam, macrosomia and acidemia are some important risk factors for adrenal hemorrhage. Risk factors of the present case were normal vaginal delivery and acidemia. The neonate may present no symptom or sign during fetal or neonatal phase. So serial sonography is considered one of diagnostic methods.

1. Introduction

Adrenal hemorrhage during neonatal phase is more prevalent than was thought before and most of the cases are diagnosed after the autopsy. However massive hemorrhage is rare [1]. The most important cause of adrenal hemorrhage is perinatal injuries, but large fetal size, maternal diabetes, congenital syphilis, anoxia, hemorrhagic diseases, and immaturity are predisposing factors. Clinical signs are associated with amount and severity of bleeding. Early diagnosis can be

performed by taking medical history, physical examination, ultrasound, and serum electrolytes. Then the suspected diagnosis can be confirmed by hormone assay [2]. The incidence rate is 1.7-1.9 per 1000 birth. Adrenal hemorrhage may be asymptomatic or present with flank abdominal mass, anemia, jaundice, or hypertension [3].

Adrenal injury secondary to abdominal trauma is quite rare because adrenal gland is located deep in retroperitoneum and is well cushioned by surrounding soft tissues. The majority of cases can be diagnosed using CT. Most cases can be treated successfully using conserva-

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tive management. The incidence of adrenal hemorrhage is 0.2% to 0.5% during perinatal phase. The diagnosis of the adrenal hemorrhage in this phase is rare [4]. Orvos [4] did a retrospective analysis in 2015 to assess the incidence, risk factors and clinical presentation of Neonatal Adrenal Hemorrhage (NAH) in term deliveries. Of 26416 term neonates delivered between 2001 and 2013, and screened with abdominal ultrasonography, 74(0.28%) displayed NAH; the male/female ratio was 1.55:1. Vaginal delivery was significantly more frequent than caesarian section among them. Unilateral bleeding occurred on the right side in 36 and on the left side in 34 without a significant difference; bilateral hematoma was found in four cases.

The most common risk factors were macrosomia and fetal acidemia while four neonates exhibited pathological acidemia. Clinical presentation included jaundice in 37, anemia in 6, and adrenal insufficiency in only one. In three cases neuroblastoma was diagnosed. Vaginal delivery, macrosomia and a fetal acidemia were the most important risk factors. In the healthy neonates with NAH, the clinical presentations were mild, with the spontaneous regression [5, 6]. Tucker et al. (2014) reported one case; a term female who was diagnosed with abdominal mass while gestational age was 32 weeks. Abdominal ultrasonography was performed after vaginal delivery and the adrenal hemorrhage in the right side was diagnosed [7]. De Coyle et al. reported a 31-week-male newborn died of respiratory failure. He was diagnosed with bilateral adrenal hemorrhage while gestational age was 17 weeks. At autopsy the adrenal was calcified and the infarction in the brain and cerebellum was seen. The

lungs were also hypoplastic. These findings were cause of severe hypoxic and ischemic state [8].

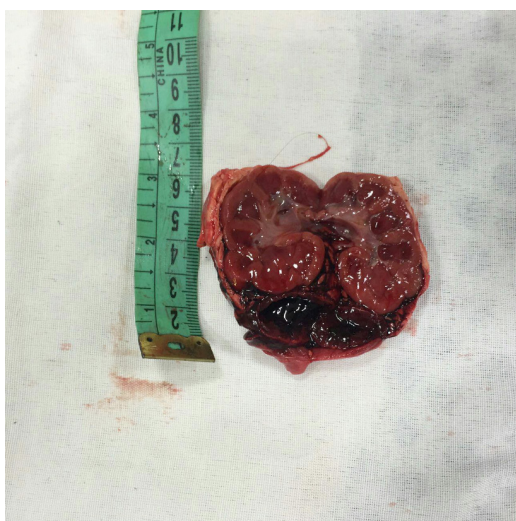
Roupakias et al. conducted a retrospective study to determine the adrenal injury associated with blunt abdominal trauma in pediatric population in 2011. Blunt adrenal injury in children is uncommon, rarely isolated, and typically present as part of a multi organ trauma [9]. Obstetric birth trauma during vaginal delivery of a macrosomic fetus may result in neonatal adrenal hemorrhage.

2. Case Report

Our case was born via normal vaginal delivery, with Apgar score 3. The baby was intubated immediately. Seizure attacks happened two hours later which was controlled by administration of phenobarbital, phenytoin, and midazolam but reoccurred a day later so topiramate was also added. Unfortunately she died following cardio-pulmonary arrest on the fourth day. Severe metabolic acidosis was reported in lab data. External Examination: A four-day-old full term female neonate; weight: 3100 g; head circumference: 35 cm; chest circumference: 33 cm; height: 50 cm. There was no gross anomaly, area of bruise or abrasion.

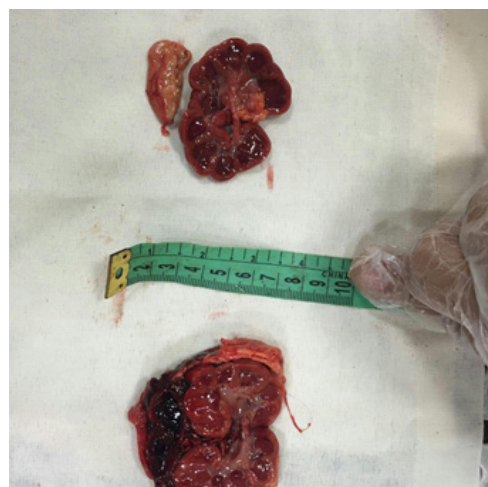
Internal examination

In head and neck examination, scalp, spine, brain, and membranes were normal without any fracture, pathology or hemorrhage. Trachea and larynx were also normal. In thorax examination, the pleural cavities had no fluid or adhesion. Lungs seemed to be red but fully inflated in thoracic cavity and in cutting there was congestion with-



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Figure 1. Left kidney with suprarenal hemorrhage



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Figure 2. Right kidney and suprarenal (normal) with left kidney and suprarenal hemorrhage



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Figure 3. Right kidney and suprarenal (normal)

out discharge. Heart had normal size without any abnormality in the chambers and the large vessels.

In abdomen examination, liver and spleen appeared normal both in size and shape. Stomach had intact mucous and contained clear watery fluid. Intestines had normal mucous and contained meconium. The left kidney appeared larger than normal and the adrenal subcapsular hematoma which amounts to 50 mL was seen (Figures 1, 2, 3). There was no gross pathology in other organs.

In pathology report examination, brain superficial vessels were congested with subarachnoid hemorrhage. Lungs had elastic consistency and edema. Alveolar spaces were congested and filled with diffuse hemorrhage. Heart and Liver appeared normal except for diffuse inflammatory cells in microscopic view. Kidney posterior pole had hemorrhage, intermediate to severe vascular congestion. Adrenal hemorrhage, and structural destruction in parenchyma were reported in macroscopic study.

3. Discussion

Regarding the weight, gestational age, vaginal delivery, and hard prolonged labor stated by mother, it seems that the size of fetus and natural vaginal delivery were factors responsible for adrenal hemorrhage besides there was no coagulation disorders either in history or in laboratory findings [1]. In the present study, the neonate had adrenal hemorrhage in the left side. But according to the retrospective analysis by Orvos et al. (when vaginal delivery was significantly more frequent than caesarian section), unilateral bleeding occurred on the right side in 36 cases and on the left side in 34 cases without a significant difference [4]. The most ap-

propriate method to diagnose the adrenal hemorrhage is ultrasonography [1, 3]. However intravenous pyelography was also applied in the past [4, 8]. Nowadays abdominal ultrasonography and adrenal tomographic scan are more appropriate methods [9] which, unfortunately, was not performed in our case.

4. Conclusion

According to previous studies, vaginal delivery, macrosomia, and acidemia are important risk factors [3] for adrenal hemorrhage which agrees with our case except for macrosomia. Due to case reports, in severe icterus, acidemia, and hypoxic cases, without recognized etiology, occult bleeding such as adrenal hemorrhage should be concerned.

Ethical Considerations

Compliance with ethical guidelines

Demographic information taken from the patient's case is considered confidential.

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Conflict of interest

All authors meet the four criteria of authorship contribution based on the recommendations of the International Committee of Medical Journal Editors. The authors declared no potential conflict of interest with respect to authorship and/or publication of this article.

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