ISSN: 2377-9004

Narasimha N. Obstet Gynecol Cases Rev 2025, 12:268
DOI: 10.23937/2377-9004268
Volume 12 | Issue 1
Open Access

Obstetrics and Gynaecology Cases - Reviews

CASE REPORT

Head-On Impact: A Rare Case of Cephalohematoma in Utero

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Abstract

Cephalohematomas are commonly observed in neonates following prolonged or difficult vaginal deliveries, though their incidence is significantly lower in uncomplicated vaginal births and virtually absent in cesarean sections. Cephalohematomas originating in utero before the onset of labor are exceedingly rare. This case report describes such an incident in a neonate after maternal trauma resulting from a motor vehicle accident (MVA), with in utero findings of persistent fetal tachycardia and non-reassuring fetal heart tones. An immediate cesarean section was performed, and the neonate was managed in the NICU for acute respiratory distress, diagnosed with both a subdural hematoma and a cephalohematoma. A comprehensive literature review was conducted using multiple databases, including UpToDate, DynaMed, PubMed, and Google Scholar, employing search terms such as "Cephalohematoma in Utero," "Cephalohematoma from Trauma," and "Cephalohematoma with Subdural Hematoma." Relevant studies were assessed to contextualize this case. The review underscores that while fetal head trauma is rare, it remains a plausible consequence of maternal trauma. Early recognition and vigilant monitoring are critical for optimal management with the potential for full recovery. This case emphasizes the need for clinicians to consider fetal head trauma in the context of maternal trauma, enabling timely interventions and reducing the risk of neonatal morbidity.

Keywords

Cephalohematoma, Maternal trauma, Cephalohematoma in utero

Introduction

Cephalohematomas are defined by the accumulation of blood within the subperiosteal space, typically resulting from shearing forces applied to the fetal skull during delivery. These forces cause separation of the periosteum from the calvarium, disrupting underlying blood vessels and leading to formation of a hematoma, and possible complications of anemia, jaundice, or kernicterus [1] (Figure 1). This condition is most frequently associated with prolonged or device-assisted vaginal deliveries, with an incidence ranging from 0.4% to 2.5% of vaginal births [1]. Conversely, reports of cephalohematomas occurring in utero are exceptionally rare, with only three documented cases, including the one we describe [2]. Most commonly, cephalohematomas are managed conservatively with observation and supportive measures, with the rationale that they will reabsorb over several weeks [3]. In more severe cases-such as larger cephalohematomas (> 7 cm in diameter) - more invasive measures, such as surgery, may be warranted [4].

Case Presentation

A 23-year-old, G2P1 female at 36 weeks gestation presented to the emergency department following an MVA with complaints of right arm and pelvic pain, but no other significant concerns. She was restrained during the accident, and the airbags deployed. Vital signs were stable on presentation, and the right arm and hip imaging showed no fractures or evidence of traumatic injury. On examination, the patient exhibited regular, painful contractions, fetal heart monitoring revealed persistent tachycardia, and patient reported decreased fetal movement. A subsequent bedside ultrasound revealed no fetal movement. Given these findings, an immediate cesarean section was recommended and

Citation: Narasimha N, Lewis S (2025) Head-On Impact: A Rare Case of Cephalohematoma in Utero. Obstet Gynecol Cases Rev 12:268. doi.org/10.23937/2377-9004268

Received: July 14, 2025: **Accepted:** August 07, 2025: **Published:** August 09, 2025

performed. A live, viable female infant was delivered with APGAR scores of 6 at 1 minute and 7 at 5 minutes in an otherwise uncomplicated delivery. No trauma was observed in the neonate, and placental abruption was not noted at delivery. However, the infant developed persistent tachycardia and respiratory distress, leading to transfer to the neonatal intensive care unit.

On physical examination, the neonate exhibited nasal flaring, chest retractions, and a tender fluid collection over the right parietal skull. The anterior fontanelles were open, flat, and soft, and the remainder of the exam was unremarkable. Laboratory results showed neonatal anemia, given a hemoglobin of 10.4 g/dL (normal: 13.5-20 g/dL), with no other abnormalities. The infant was diagnosed with a subgaleal hemorrhage and placed on noninvasive neurally adjusted ventilatory assist (NIV NAVA). A head X-ray to assess for a skull fracture was inconclusive, and a CT scan was recommended but delayed for six days, as the neurosurgeon opted to monitor the hematoma, which had not expanded during this time. Upon eventual CT imaging, a thin 2.8 mm subdural hematoma without significant mass effect was noted, along with diastasis of the right coronal and lambdoid sutures. A subsequent brain MRI confirmed the cephalohematoma finding and revealed no intracranial abnormalities. The infant was gradually weaned from NIV NAVA to room air and transitioned from total parenteral nutrition to oral feeding due to initial difficulty with weight gain. The infant's condition improved, and she was discharged once medically stable (Figure 2, Figure 3 and Figure 4).

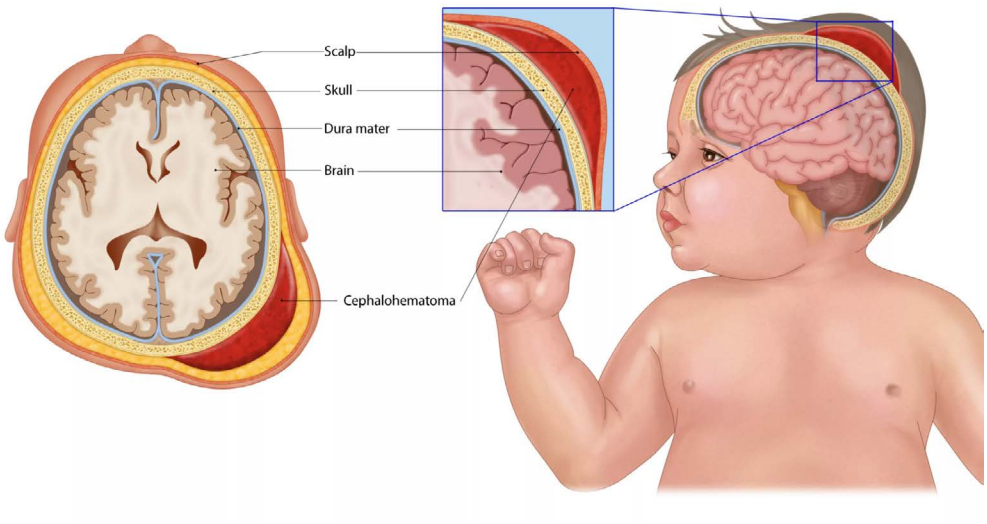

Figure 1: Description and visual aid of cephalohematomas.
Sikorskyj T (2023) Cephalohematoma: Causes, treatment, management & healing time.

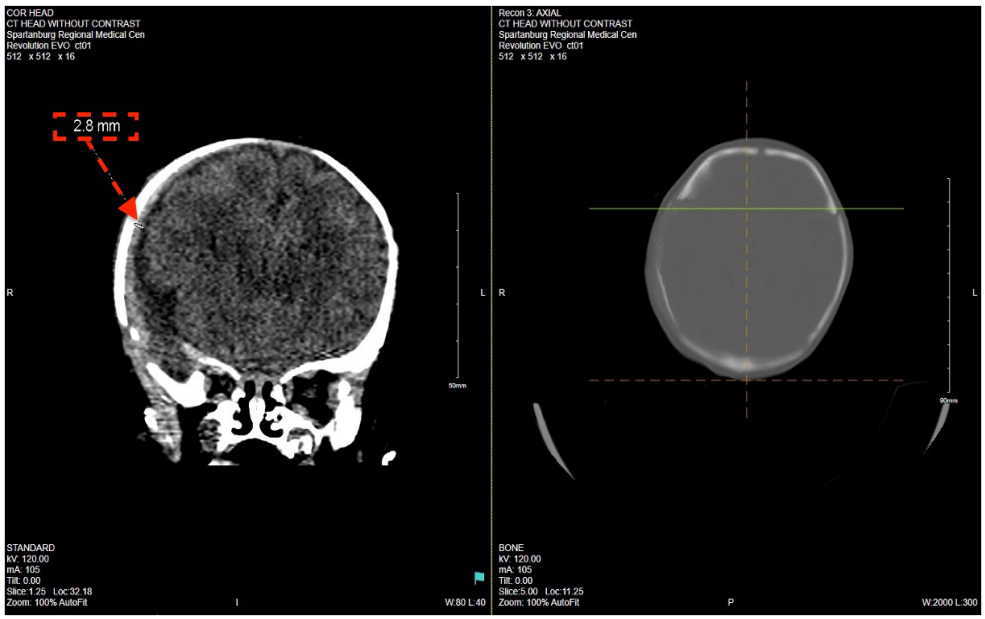

Figure 2: CT revealing subdural hematoma.

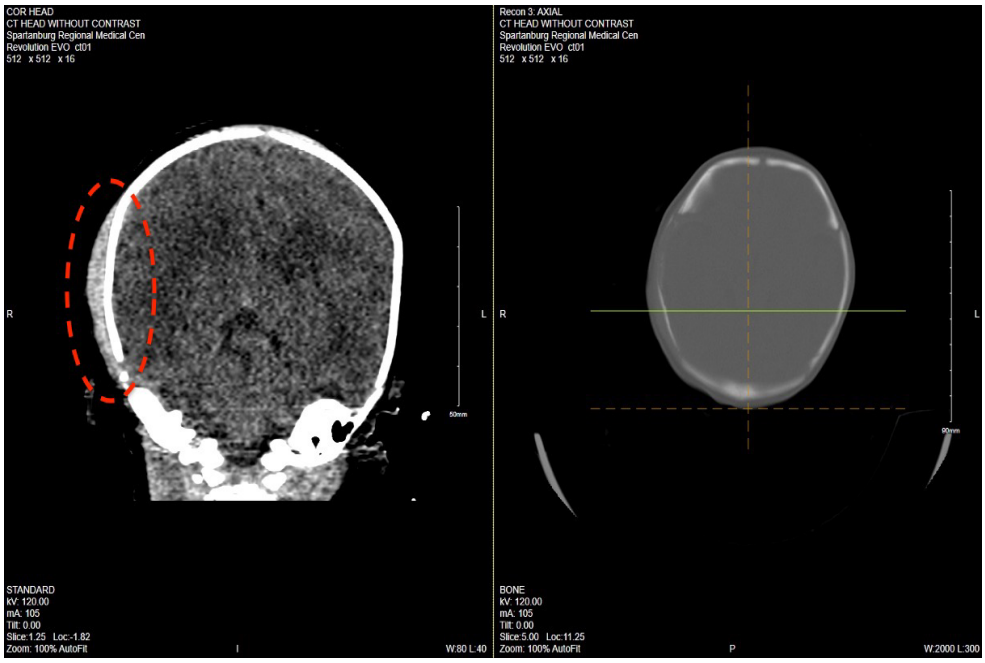

Figure 3: CT of cephalohematoma.

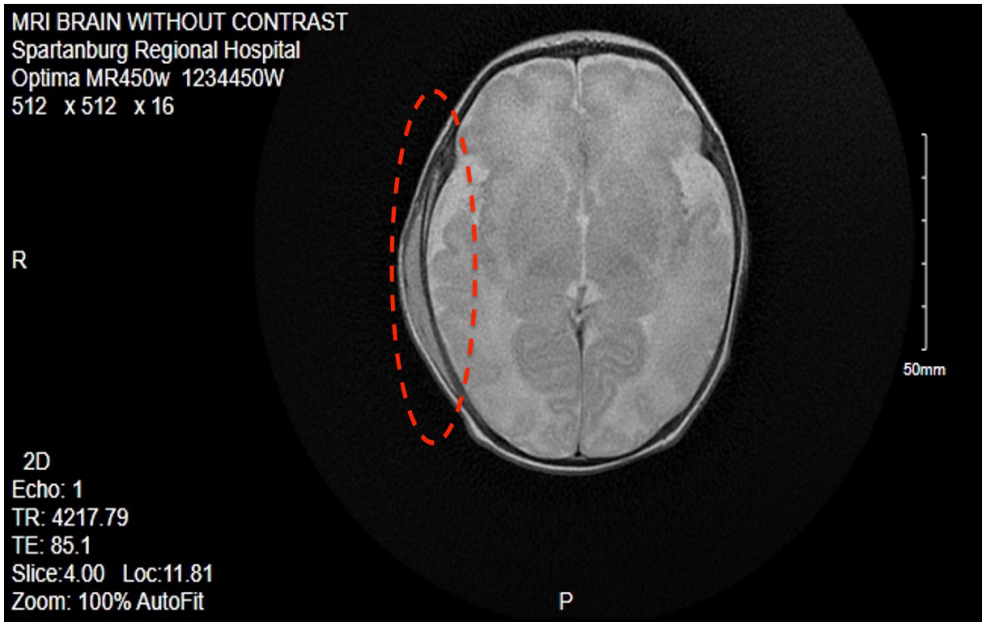

Figure 4: MRI revealing evidence of cephalohematoma.

Discussion

Acute cephalohematomas are relatively common in neonates, typically resulting from factors such as pelvic pressure during labor, prolonged labor, device-assisted delivery, and fetal macrosomia, to name a few. However, cephalohematomas caused by in utero trauma are exceedingly rare, making this case particularly noteworthy. To date, there are no documented instances linking fetal cephalohematoma to rapid deceleration following a motor vehicle accident, where the impact of the parietal bone against the maternal pelvic bone may have contributed to the injury.

Although tachycardia and respiratory distress are not typically associated with cephalohematomas, these symptoms may be interpreted as a stress response to the traumatic event. Additionally, given the gestational age, the respiratory distress may be influenced by lung immaturity, further exacerbating the condition [5]. Neonatal anemia, a known secondary effect of cephalohematomas, was also observed in this case [6]. Fortunately, all symptoms gradually resolved as the injury healed. Management of cephalohematomas is generally conservative, with surgical intervention reserved for severe cases, though it remains

controversial due to the potential for infection and other complications [7]. Some studies have seen that early management in cephalohematoma > 50 mm is unnecessary unless otherwise indicated [3]. Others indicate that early interventions, such as aspiration, would be more beneficial in the long term to prevent ossification [8]. Ultimately, management should be addressed on a case-by-case basis depending on what the patient will tolerate and benefit from the most. In this patient's case, invasive measures were deemed unnecessary, as the neonate's condition improved with observation and symptomatic support.

Conclusion

The unique circumstances of this case emphasize the importance of considering fetal cephalohematoma in the differential diagnosis for pregnant individuals involved in traumatic accidents, especially when fetal instability cannot be attributed to other causes. Early detection is crucial, as it may prevent progression to chronic cephalohematoma and mitigate the risk of associated complications.

Contribution

Neethi Narasimha contributed to conception and design, drafting of article, acquisition of data, or analysis and interpretation of data; Dr. Steven Lewis critically revised it for important intellectual content and gave final approval of the version of the article to be published; and all authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

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