



# **Ruptured Neonatal Subgaleal Haemorrhage: Challenges of Management from a Resource Limited Setting**

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## **Authors' contributions**

*This work was carried out in collaboration between all authors. Author MB designed the study, performed the statistical analysis, wrote the protocol and first draft of the manuscript. Authors AN, AA and ABU managed the analyses of the study. Authors SP and TA managed the literature searches. All authors read and approved the final manuscript.*

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**Case Study**

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## **ABSTRACT**

Despite advances in obstetric and neonatal care, subgaleal haemorrhage continues to create significant challenges to health personnel, especially in poor human resource/ facility settings, where a specialist may not always be readily available, thereby contributing significantly to morbidity and mortality. This study was undertaken to highlight the different methods of presentation of subgaleal haemorrhage and the need for early identification and management to improve the outcomes. A confirmed case of ruptured subgaleal haemorrhage was documented over a 12-month periods where no mortality was recorded. The high index of suspicion is the key to early diagnosis. Identification of risk factors, early diagnosis, and prompt and aggressive treatment of hypovolemia will reduce morbidity and mortality.

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## 1. INTRODUCTION

Subgaleal haemorrhage is a collection of blood in the soft tissue space under the aponeurosis, but above the periosteum of the skull [1]. It is the most severe form of extracranial haemorrhage in newborns and is most often seen after vacuum or forceps-assisted deliveries. However, it can occur even in normal deliveries [1-8]. The incidence has been estimated to be approximately 1 in 2,500 spontaneous vaginal deliveries without the use of vacuum or forceps. A 10-fold increase has been reported with the use of forceps. A 12–25% rate of mortality has been reported [2,6,9]. The literature on management of neonatal subgaleal hematomas is relatively rich, never the less, this case report focused on describing the management challenges in a low-resource setting and the need for early identification and management to improve the outcomes.

## 2. CASE REPORT

The baby HA was admitted at the age of 5 days on account of swelling of the head noticed at birth and was found to be increasing progressively.

The baby was delivered by a 23-years-old primipara. Pregnancy was booked at 5 month gestation, and the mother had 4 uneventful visits. There were no perinatal risk factors for sepsis identified. The mother was prescribed to take blood tonic and Paracetamol for occasional abdominal pain. There was no history of smoking or alcohol ingestion during pregnancy. She was not known to be hypertensive or diabetic and had no history suggestive of gestational diabetes.

The delivery was spontaneous and vertex following an initial failed attempt at vacuum delivery. Apgar scores were 8 and 9 at one and five minutes, respectively, birth weight of 3.3 kg, length of 56 cm and head circumference of 32 cm. Both baby and mother were discharged home 3 hours after delivery. At home, mother was massaging the baby's head with rag soaked into hot water. The baby was taken to a secondary medical facility with increasing swelling of the head and increased softening of the swelling portion. The baby was admitted for 2 days during which some medications were prescribed. The baby was referred to a tertiary facility as the baby's clinical condition was worsening.

Major findings of this investigation were an acutely ill baby with the following specifications: febrile (38.2), deeply jaundiced with severe pallor, weight of 3.4 kg, occipitofrontal circumference of 40cm, respiratory rate at 68 per minute; Broncho vesicular breath sounds and there were no crepitations. The baby had tachycardia with the heart rate of 220 beats per minute. The baby was conscious but lethargic with normotensive anterior fontanelle. He had generalized head swelling involving the right parietal to occipital region, soft in consistency with some areas of tenderness. The findings on abdominal examination were normal (Fig. 1).

A working diagnosis of a 5 days old term baby with subgaleal haemorrhage was found to turn complicated by severe anaemia, hyperbilirubinaemia, presumed sepsis and hypovolaemic shock was made. Investigations revealed a Packed Cell Volume (PCV) of 13%, random blood glucose of 1.4 mmol/L, Full Blood Count revealed a PCV 13%, White Blood Cell of  $6.0 \times 10^9$  /L, Neutrophil = 58%, Lymphocyte = 30%, Eosinophil = 06%, Monocyte = 06%, Platelets =  $73 \times 10^9$ /L, serum bilirubin was total of 10.8 mg/dl and conjugated 9.8 mg/dl (90% conjugated). Blood culture did not grow any organism. Transfontanelle scan revealed normal cerebral and cerebellar hemispheres with large collection in the scalp organised haematoma.

After an initial administration of 20 ml/kg of normal saline, the baby had a double volume exchange blood transfusion using 544 ml of fresh whole blood. The baby was also treated with antibiotics – IV Ampicillin/Sulbactam at 150 mg/kg/day in two divided doses and IV gentamycin at 5 mg/kg/day, IVF 4.3% Dextrose in 0.18 saline at 120 ml/kg/day and phototherapy. The clinical condition was improved within 48 hours of admission, but the post – EBT PCV was 30% necessitating a top-up transfusion of 15 ml/kg of packed cells.

By the seventh day of admission, the baby was noticed to be bleeding actively from a darkly pigmented area on the right parietal region of the scalp, however, bleeding continued despite application of dressing over the area. This necessitated surgical evacuation of the haematoma with another transfusion of 15ml/kg of packed red cells. The bleeding stopped thereafter and the baby continued to improve. The head circumference dropped from 40 cm to 34 cm (Fig. 2).



**Fig. 1. Baby's condition at presentation prior to EBT and top-up blood transfusion showing severe pallor with enlarged head**



**Fig. 2. Baby's condition after EBT and top-up blood transfusion showing the site of rupture on the scalp and improvement of pallor following blood transfusion**

The baby was discharged home 25 days after admission and was observed for a week following the discharge till clinical state was stable.

### 3. DISCUSSION

Subgaleal haemorrhage is an accumulation of blood in the loose connective tissue of the subgaleal space [1] and it can occur following a normal delivery, forceps-mediated delivery, or

caesarean section. It is the most serious form of extracranial haemorrhage in newborns [1,5,6,10]. It occurs most frequently following vacuum-assisted delivery. These infants usually are presented at birth or within a few hours following delivery, and the risk of death increases with delay in identifying the condition and initiating aggressive treatment [11]. An acute renal failure from hypovolemia and coagulopathy are poor prognostic factors and mostly are controlled through fluid administration and blood

transfusions [6,8]. Mortality rate has been reported to be between 12-25% [1,2]. The literature on subgaleal haemorrhage in Nigeria is limited, [8] though many cases have been observed worldwide.

Most documented cases occurred following assisted modes of delivery, during the use of vacuum and forceps. However, this condition can also occur following caesarean deliveries or at other times following the normal deliveries [1-7]. Subgaleal hematoma can also occur in children following minor head trauma [12]. The case reported here, occurred following an attempted vacuum that failed. The baby's head was observed to be enlarged within 24 hours following delivery, and it progressively increased in size. The parents were using a rag soaked in warm water to massage the swollen scalp, but the baby later presented in the hospital with hypovolemic shock and severe anemia. The baby initially had normal saline administration to correct the hypovolemic shock followed by an exchange blood transfusion. The swelling later ruptured with blood oozing, necessitating drainage of the blood with daily dressing of the wound packed with sterile gauze. The rupture might be a result of the warm compress and/or repeated massage, prior to admission at the hospital, thereby weakening the tissues. It can be said from the present study that the babies delivered through vacuum or attempted vacuum should be observed closely for the complications of subgaleal haemorrhage with prompt management to reduce mortality.

#### 4. CONCLUSION

The neonatal subgaleal haemorrhage is an important and primary cause of morbidity and mortality. Identification of risk factors, close observation with aggressive management of complications would significantly improve the outcome.

#### CONSENT

As per university standard guideline participant consent and ethical approval has been collected and preserved by the authors.

#### ETHICAL APPROVAL

As per university standard guideline participant consent and ethical approval has been collected and preserved by the authors.

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#### COMPETING INTERESTS

All authors declare that there were no conflicts of interest in relation to the work described in this paper.

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