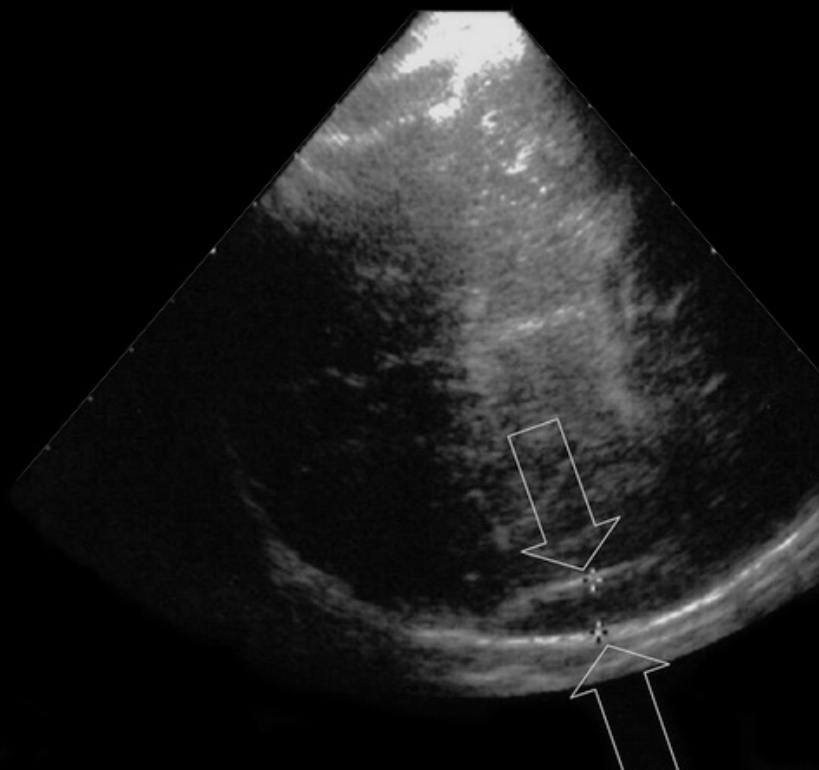


SWISS SOCIETY OF NEONATOLOGY

## Epidural hemorrhage after vacuum extraction

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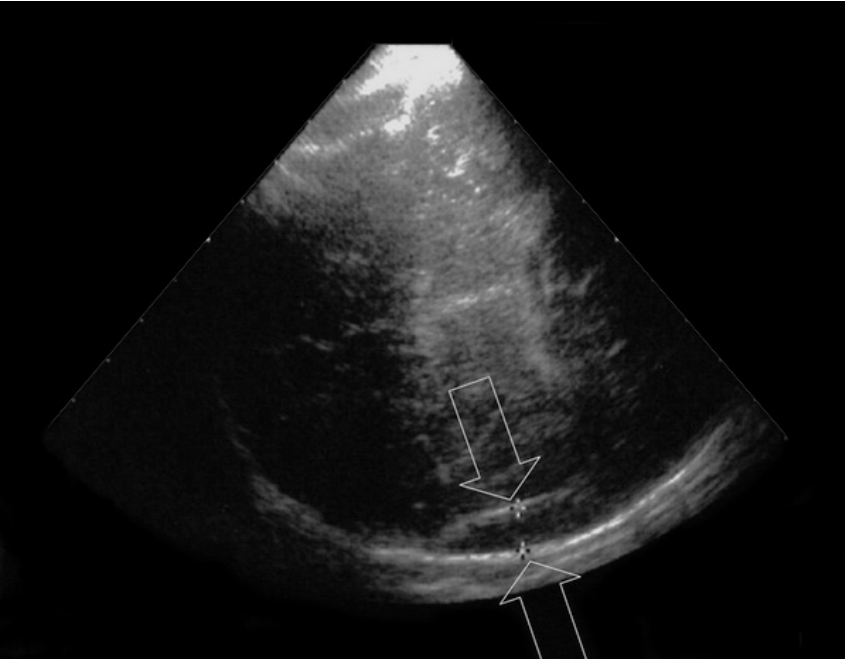
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Infants delivered by vacuum extraction or by forceps are at significantly higher risk of sustaining trauma than those born by spontaneous vaginal delivery (1,2,3). Prompt diagnosis of injuries and initiation of appropriate treatment are crucial, particularly in the case of intracranial hemorrhage. We would like to emphasise the role of cranial ultrasonography as a useful diagnostic tool in the early assessment of an infant following a difficult delivery by vacuum extraction.

We present the case of a term male infant born to a 33 year gravida 4, para 2 mother, following an uncomplicated pregnancy. During labour signs of fetal distress as well as meconium-stained amniotic fluid were evident and it was decided to expedite delivery by vacuum extraction. A soft cup vacuum (Kiwi®) was used and two attempts at delivery were unsuccessful, with detachment of the cup. A metal cup was used on the third attempt and was also unsuccessful. The baby, which was in an occipito-anterior position, was delivered following a fourth attempt, again using the soft cup vacuum. Initially the baby responded well to resuscitation with an Apgar score of 4/9/9 at 1, 5 and 10 minutes respectively and an umbilical artery pH of 7.17. He had a birth weight of 3400g (P 10-50), length of 52cm (P 50-90), and head circumference 38.8cm (P >90). He was admitted to the neonatal intensive care unit for respiratory distress, signs of shock and a large swelling over the occiput. Following volume expansion

sion with normal saline, the blood pressure stabilized and respiratory symptoms normalized. Neurological examination was normal. Cranial ultrasonography was performed using the conventional anterior fontanelle approach as well as transcranial temporal imaging. An intracranial hematoma, in the fronto-occipital region and a diffuse subgaleal hemorrhage in the occipital region were documented. Neither intracerebral hemorrhage nor ventricular asymmetry were detectable. On the second day of life a cranial computed tomographic scan was performed and the diagnosis of an epidural hematoma as well as the subglacial hemorrhage were confirmed. An ultrasound on the fourth day showed no change in the epidural hematoma, which had a maximum diameter of one centimeter. The baby showed no signs of elevated intracranial pressure or neurological abnormalities and serial hemoglobin values were in the normal range and stable. The baby could be discharged home on the 11th day of life and a follow-up ultrasound done at 14 days showed a resolving epidural hematoma.

At the age of 18 months, the child showed some mild developmental delay; at this point, it is unclear whether this is a consequence of the traumatic birth or related to other unknown factors.

**Fig. 1**

*Transcranial ultrasonography showing the epidural hematoma.*

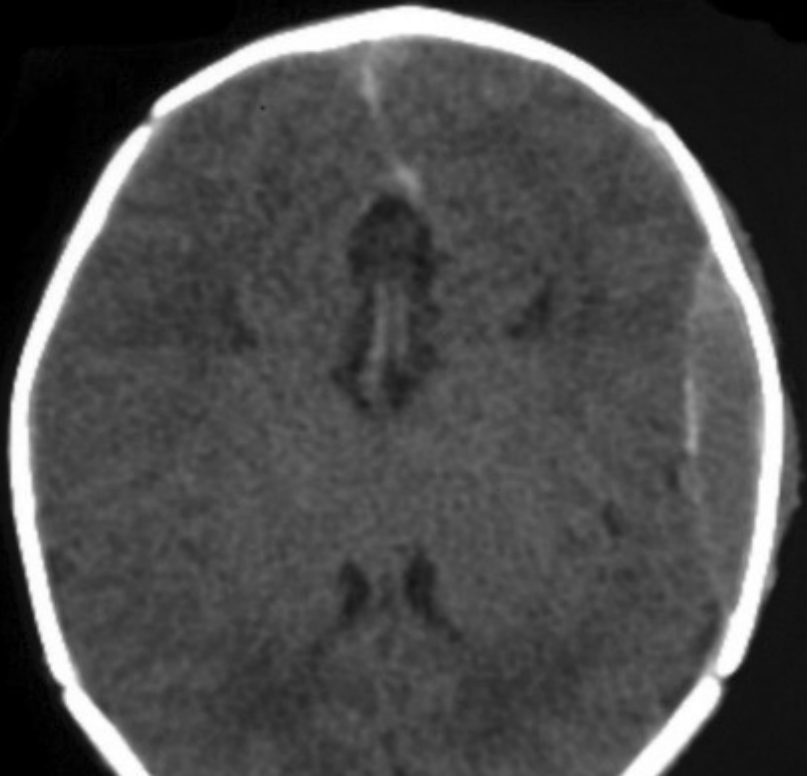


Fig. 2

*CT confirmation of left-sided epidural hematoma.*



Fig. 3

*Transcranial imaging technique (not the patient described in the case report).*

## DISCUSSION

Intracranial hemorrhages following delivery by vacuum extraction are rare events. Extensive changes in the applied pressure and shearing forces may develop after detachment of the vacuum cup and loss of vacuum and may damage intracranial structures. According to Towner et al. (1) intracranial hemorrhage occurs in 1 of 860 infants delivered by vacuum extraction (nulliparous women). It occurs in 1 of 664 infants delivered by forceps and in 1 of 1900 delivered spontaneously (1). Intracranial hemorrhages are alarming and may be life-threatening. Prompt diagnosis is therefore crucial. As the baby may be unstable following a difficult delivery, imaging techniques such as tomography and magnetic resonance imaging (MRI) may be unsuitable in the hours after birth. Cranial ultrasonography is a reliable, readily available noninvasive technique, which can be performed at the bedside. The conventional imaging views for example through the anterior fontanelle can be augmented by additional views (4). Thanks to technical improvements in ultrasonography, the brain may be viewed transcranially as well, i.e. through the bone. Transcranial imaging allows visualization of the peripheral brain (5). Experienced operators as well as appropriate equipment are prerequisites for reliable ultrasound diagnosis. CT-scan or MRI can be considered once the baby's condition has been stabilized.

## CONCLUSIONS

Cranial ultrasonography is a non-invasive, economic and readily available bedside method which facilitates



an early diagnosis of intracranial hemorrhages following traumatic delivery. Cranial ultrasonography must be performed as soon as possible following all traumatic assisted deliveries to rule out life-threatening intracranial hemorrhages.

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## REFERENCES

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