Learning from errors

Long-term infant subcutaneous retention of a fragment of fetal scalp electrode following caesarean section

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The authors present the case of an uncommon yet potentially fatal complication after the use of a scalp electrode for intrapartum fetal heart rate monitoring. A 25-year-old nulliparous woman in spontaneous term labour had a fetal scalp electrode applied and subsequently required an emergency caesarean section. After discharge home, the mother noticed a swelling on her baby's head, where the scalp electrode had been attached. Healthcare providers neglected the mother's repeated concerns about the nature of the swelling. Seven months later, a metal spiral was expelled from the baby's head which appeared to be a broken part of the scalp electrode. The remaining metal was removed with no further signs or complications. We are aware of only a few similar cases which have been reported in the published literature.

BACKGROUND

Electronic fetal heart rate (FHR) monitoring, also known as fetal cardiotocography (CTG), monitors the FHR simultaneously with uterine contractions. This is an indirect assessment of the oxygenation and the wellbeing of the fetus during labour. Most commonly, the FHR is monitored externally using an ultrasonic Doppler device and the contractions are monitored concurrently via an external strain-gauge device.

During labour, when a more precise record of fetal wellbeing and its capacity to withstand the rigours of labour is required, internal monitoring may provide more accurate monitoring information by applying an electrode to the fetal scalp. The electrode picks up the fetal ECG and the CTG monitor converts it 'beat-to-beat' into the FHR record.

The strength, duration and frequency of uterine contractions can also be monitored directly, internally using an intrauterine pressure (IUP) transducer within the uterine cavity. Both scalp electrode application and IUP insertion require rupture of the fetal membranes¹

Continuous FHR monitoring with a scalp electrode is used in most hospital labour ward departments in high-income countries and is generally considered to be a safe procedure. Common complications of the use of fetal scalp electrodes are small skin tears, less common are superficial localised infections and rarely skin lacerations and haematomata occur. However, these are usually self-limiting without long-term sequelae with the rare exception of small scars. A peculiar but rare long-term complication is localised accelerated hair growth. Rare complications

Figure 1 (A,B) Swelling on the baby's head containing a part of a broken fetal scalp electrode after delivery (A) and at 6 months (B).

Figure 2 The broken fetal scalp electrode exposed on a credit card.

include fetal scalp lacerations, abscess, septicaemia and meningitis.^{2 3}

Healthcare professionals should be aware of the risk that, a broken scalp electrode could remain subcutaneously in the newborn and cause potentially lethal infection.

CASE PRESENTATION

A 25-year-old nulliparous woman presented at term in labour. She had an epidural inserted and artificial rupture of the membranes. A fetal scalp electrode was fixed to monitor the FHR pattern. Due to failure to progress in labour, she had an uneventful emergency cesarean section with no postoperative complications.

At home, the mother noticed a swelling on her baby's head, where the scalp electrode had been situated (figure 1A,B). There were no signs of infection. On several occasions she consulted both nurses and doctors but was told that, this was a normal scar tissue. Seven months after the delivery, the mother discovered a metal spiral sticking out from the baby's head. The bump appeared to be due to a part of the scalp electrode that had broken off under the skin (figure 2). After removal of the remaining piece of the metal electrode, the swelling decreased with no further complications.

DISCUSSION

During a search of the literature, we found very few similar cases. These occurred more than 30 years ago involving persistent retained material from broken disposable fetal scalp electrodes, that were reused after sterilisation. In one of the cases, a 3-month-old infant had repeated incidents of minor abscesses localised at the place where the scalp electrode had been attached during labour. The fragment

was surgically removed with no further complications.⁴ We are also aware of an unpublished case from the same period which resulted in an intracerebral abscess which caused the death of the baby.

Learning points

- ▶ Never re-use scalp electrodes used for fetal monitoring since the metal may be weakened and break off. Also be aware that even new electrodes might break, as in this reported case.
- ▶ Always remove the electrode correctly by a screwing motion, not by pulling.
- ▶ If there is a swelling at the place from where the scalp electrode was removed, be aware that there might be a part of the electrode hidden underneath the skin.
- ▶ If the baby becomes infected during the neonatal period and there is no obvious focus, check the baby's skin for possible foreign body from the scalp electrode if the baby was electronically monitored during labour.

Competing interests None.

Patient consent Obtained.

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