

### Picture story

## **A case of bilateral humeral fractures associated with Erb's palsy in a newborn**

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(Key words: Birth trauma, Humerus fracture, Difficult labour, Malrotation, Erb's palsy).

### **Introduction**

Bony fractures during delivery have been reported to occur at a rate of 6.7 to 14 per 1000 live births, with isolated humeral fractures occurring at a rate of 0.05 per 1000 live births<sup>1</sup>. We present a newborn with bilateral humeral fractures associated with Erb's palsy which is extremely rare.

### **Case report**

A term male baby weighing 2.8 kg was born vaginally to a primigravida mother following a difficult labour. The delivery was conducted in our institute and there was a prolonged second stage of labour leading to non-progression requiring instrumentation during delivery. It was a booked case and all routine antenatal check-ups were done regularly. Antenatal scan showed no fetal anomalies. There was no history of drug or radiation exposure, fever with rash, decreased fetal movements or chronic illness. There was no family history of osteogenesis imperfecta or skeletal dysplasia. The Apgar scores at 1, 5 and 10 minutes were 6, 7 and 9 respectively. Baby needed bag and mask ventilation for 20 seconds and was shifted to the neonatal intensive care unit (NICU) in view of his delayed cry. After 15 minutes of NICU stay, the heart rate was 142 beats per minute, respiratory rate 62 breaths per minute, capillary refill time 2 seconds, and saturation was 92% at room air with nasal flaring, grunting and subcostal retraction, with

a Downe score of 6. Baby was started on maintenance intravenous 10% dextrose and kept nil by mouth as he had moderate respiratory distress. Baby was put on nasal continuous positive airway pressure (CPAP) with FiO<sub>2</sub> of 30% and PEEP of 5cm of water and oxygen flow of 5 litre per minutes and baby was maintaining saturation of 98% with above settings. Over the next 24 hours, his respiratory distress settled and baby was weaned off CPAP and put on oxygen hood with a flow of 6 litres /minute.

On examination, baby was term gestation with a birth weight of 2800g, length 48cm and head circumference 37cm. He had a boggy scalp swelling and swellings over both arms with paucity of movements. Each upper limb was held in adduction and internal rotation, extension at the elbow, and wrist flexion. The abnormal position, lack of limb movement, and clinical suspicion raised the possibility of fractures and an x-ray of both upper limbs showed bilateral humeral shaft fractures as shown in Figure 1.

No other fractures were detected in the skeletal survey. At 24 hours of life, laboratory investigations revealed a haemoglobin level of 15.6 g/dL, total leucocyte count of 18,900/cu mm, platelet count of 160,000/cu mm, serum total calcium level of 8.9 mg/dL, serum magnesium level of 2.0 mg/dL and serum phosphorus level of 6.6 mg/dL. Other relevant investigations like blood gas analysis, C-reactive protein level, serum bilirubin and thyroid profile were in the normal range. Electromyography and nerve conduction studies were not feasible at that time, but the typical limb posture confirmed the diagnosis of Erb's palsy. An orthopaedic opinion was obtained, braces were applied and the limb immobilised as shown in Figure 2.

At subsequent follow-up, limb movements were slowly improving, and fracture was completely healed after 2 months without any residual deformity. The limb posture and movement were normal at follow up visits and full recovery occurred over the next few months.

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**Figure 1:** Displaced fractures of shafts of both humeri indicated by blue arrows



**Figure 2:** Limb immobilization with orthopedic braces

\*Permission given by parents to publish photograph

### Discussion

Birth injuries include cephalhaematomas, bony fractures, intracranial haemorrhage, facial palsy and brachial plexus injuries, trends changing over time<sup>2</sup>. Potential risk factors for bony fractures include macrosomia, obstructed prolonged labour, malposition and delivery manoeuvres occurring as a result of rotation or hyperextension of the hand during passage through the canal in a difficult delivery<sup>3</sup>. Erb-Duchenne palsy is caused by damage

to the cervical roots at C5 and C6 and is characterised by paralysis in the upper arm. This is the most common type of brachial plexus injury, resulting in adduction, internal rotation, and finger flexion of the hand<sup>4</sup>. Diagnosis of a bone fracture is made on the first day by meticulous clinical examination and imaging. Abnormal position, lack of limb movement and clinical suspicion all point to a fracture. It is confirmed by x-ray of the bones, ultrasound, and magnetic resonance imaging<sup>5</sup>. Emergency caesarean delivery carries a higher risk of long-bone fracture than vaginal delivery. Prematurity, malpresentation, abnormal lie, and multiple pregnancies may predispose to long-bone fractures. Management of Erb's palsy is mostly conservative. Shaft humerus fractures rarely require surgical intervention in neonates.

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