

# Bilateral Neonatal Humerus Shaft Fracture During Elective Cesarean Section – A Rare Case Report

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## Abstract

*Background: Humeral fractures are the second common long bone fractures of the neonatal period after clavicle. Most cases of birth-related humerus fracture are reported during a vaginal breech delivery. The cesarean section does not eliminate the risk of long bone fractures. A humerus fracture is less common but still can happen due to forceful maneuvers like traction during cesarean which can go unnoticed to operating obstetrician or misinterpreted as brachial plexus injury by an inexperienced orthopedic surgeon.*

*Case Report: We received a call from the neonatal intensive care unit (NICU) for a 5-day-old 2.9 kg male baby delivered to primigravida at 38 weeks by elective cesarean for transverse lie, for not moving his both upper limbs. On examination by orthopedic surgeon, swelling, contusion, crepitus, and abnormal mobility at the both arms were noticed. Gentle manipulation made the neonate cry. Range of movements (ROMs) of wrist, elbow, and hand were within normal limit without any neurovascular deficit. Hence, the initial diagnosis of brachial plexus injury/Erb's palsy was revised. X-ray of the right and left upper limb was ordered which showed an isolated mid-shaft bilateral humerus biocritical fracture. A high U shape slab was applied for a week and the baby was discharged with proper advice to the mother to follow-up on the next week.*

*Conclusion: Obstetricians and pediatricians should remain vigilant for the rare occurrence of humerus fracture during cesarean so that they are not missed and managed timely to prevent future disability and deformity.*

**Keywords:** Humerus, Fracture, Neonate, Bilateral, Cesarean Section, Long Bone fractures, Birth Trauma, Obstetric Maneuvers, Brachial Plexus Injury.

## Introduction

Humeral fractures are the second common long bone fractures of the neonatal period after clavicle [1]. Most cases of birth related humerus fracture are reported during a vaginal breech delivery [2]. However, very rarely such cases have been reported during emergency cesarean for breech presentation [3]. As obstetricians are more vigilant during elective cesarean, to the best of our knowledge, there is no reported case of humerus diaphyseal fracture during an elective cesarean. Herein, we report a unique case of a baby delivered by elective cesarean for the transverse lie and referred to the orthopedic department with swelling and relative immobility of right and left arm which was first misin-

terpreted as birth-related brachial plexus injury but later found to have humerus diaphyseal fracture bilaterally.

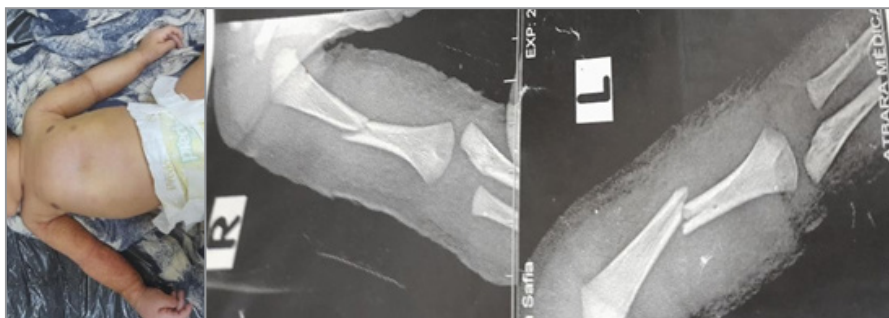
## Case Report

A healthy 32-year-old, primigravida, was admitted to the obstetrics clinic at public hospital for planned C/S because of determined transverse lie presentation at 38 weeks' gestational age. A lower segment transverse cesarean section was performed and a 2,900 g male was delivered which was difficult because of head entrapment. Obstetrician made a maneuver for delivering the head by catching the arms and the chest. In 4–6 h following delivery, it was noted that the neonate remained irritable, crying

and was disinterested in feeding. There was no history of metabolic bone disease, osteogenesis imperfecta, diabetes mellitus, and syphilis in parents or family. Orthopedic resident examined the neonate demonstrated a lack of spontaneous movement of arms and absence of Moro reflex and suspected it to be birth-related brachial plexus injury.

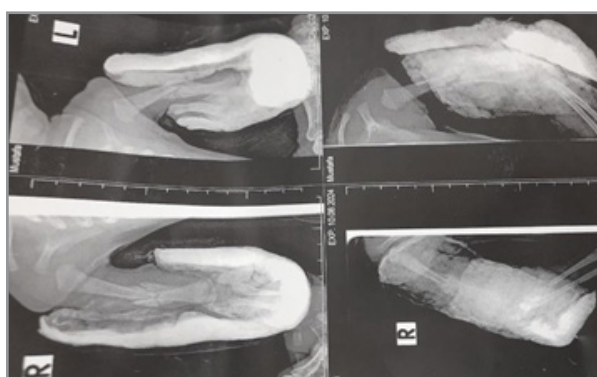
On examination by the senior orthopedic surgeon, swelling, contusion, crepitus, and abnormal mobility at the both arms were

noticed. Gentle manipulation made the neonate cry. Clavicle, femur, and pelvis were found to be normal. The wrist, elbow, and hand ROM were within normal limit suggesting no nerve injury. There was a good capillary refill and well-felt radial pulse. Rest physical and systemic examinations were normal without any abnormal attitude of waiter's tip hand, so the initial diagnosis of brachial plexus injury/Erb's palsy was revised. X-ray of the both upper limb was ordered which showed bilateral mid-shaft humerus bicortical fracture, as shown in (Fig.1a- 1b)



**Figure:** 1a-Showing Clinical Photo of Neonatal Upper limbs. 1b – Showing x- ray of Right Humerus fracture. 1c- Showing x-ray of left Humerus Fracture).

Physical examination suggested no distal neurovascular deficit, so no further investigation was done. A U shape slab was applied for a week and the baby was discharged with proper advice to the mother. After 7 days, a check X-ray was done as shown in (Fig. 2).



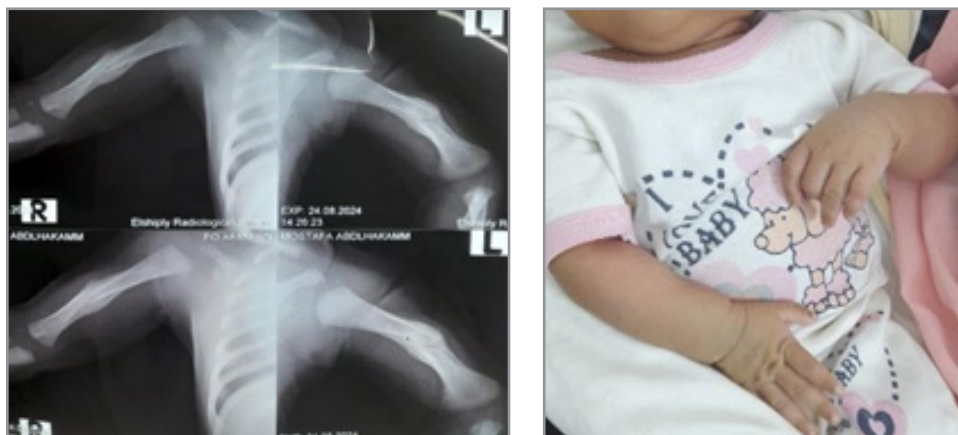
**Figure: 2** – Showing x-ray of Both Humerus Fracture Splinted by U Shape Slap).

At the final visit, no abnormal mobility, crepitus, or tenderness were felt over the fracture site with complete ROM of the shoulder, elbow, and wrist, as shown in (Fig. 3b- 4c).



**Figure: 3-a and b** Showing x-ray of Both Hummers Healed with Callus Formation). 4b-Showing Clinical Photo of Neonatal Upper Limbs with Good Range of Motion.

The final X-ray showed abundant periosteal callus suggesting healing fracture under remodeling, as shown in (Fig. 3a-4a- 4b).



**Figure: 4a** Final X-ray Showed Abundant Periosteal Callus Suggesting Healing Fracture Under Remodeling .4b- -Showing Clinical Photo of Neonatal Upper Limbs with Good Range of Motion.

### Discussion

The incidence of birth-related long bone injuries is 0.23–4/1000 live births with humeral fracture incidence as 0.05/1000 live births [4]. Three- fourths of delivery-related long bone fractures occur during vaginal breech deliveries [5]. Birth injuries including long bone fracture are rare but still known complication occurring during cesarean deliveries [6]. The frequency of fetal injury at cesarean delivery varies with the indication for surgery as well as with the duration of skin incision-to-delivery interval and type of uterine incision [7]. Various maneuvers performed during cesarean (particularly during traction), inadequate incision line, macrosomia, breech presentation, and shoulder dystocia increase the risk of long bone fracture [8].

Although the most frequently affected bone during cesarean delivery is the clavicle, other long bone fractures, such as humerus and femur, are also reported in the literature [9]. Fractures within the 1st week of life without any related factors (rickets, osteogenesis imperfecta, or abuse) or history of trauma suggest delivery complications [10]. In our case, there was no history of trauma or any related factors to cause the humerus fracture. Thus, we considered that fracture was caused by maneuvers performed during cesarean delivery due to malposition of the baby.

Diagnosis of these fractures is generally delayed, due to its rarity. Nearly one- half of patients with birth fractures were diagnosed after a delay of 3–7 days [10]. Clinical findings of birth related humerus fracture can be confused with dislocation or congenital brachial plexus injury if the practitioner is not experienced [11] as happened during the initial examination in our case. Therefore, any abnormal attitude of adduction and internal rotation of the arm and waiter's tip hand should be inspected keenly before making a clinical diagnosis and ordering relevant investigations. Humeral fractures of neonates are often greenstick type, although complete fracture with overriding bones may occur. Neonatal humeral fractures can occur in the proximal or distal epiphysis or diaphysis.

Usually, diagnosis of humeral diaphysis fracture can easily be made with X- ray, but diagnosing epiphyseal fractures may require an ultrasound, magnetic resonance imaging, or even arthrography [11]. In this case, the diagnosis was made on X.ray.

Due to proximity to neurovascular structures, humeral fractures can be accompanied by brachial artery, radial, median, and ulnar nerve injuries, or combined artery nerve injuries [12]. These injuries can be disastrous and change management plan. Our case reported with no neurovascular injury.

Although several techniques have been reported from simple chest bandages, von Rosen splints, U slab, above elbow slab, or cast for the treatment of these fractures, the established treatment method is closed reduction followed by cast immobilization .In postnatal fractures, remodeling is very rapid and effective; humeral fracture rarely fails to heal [11].

### Conclusion

To the best of our knowledge bilateral humerus fracture after C/S delivery has not been reported yet. Although C/S decreases the trauma- related morbidity in breech presentation, it does not reduce it to null. Forced obstetrical maneuvers always carry a risk of soft tissue injury, long bone fracture and related neonatal complications.

long bone fractures are among the most unwanted complications of the birth- related injury. Even though the obstetrician is more vigilant during elective cesareans, long bone fracture can still happen during childbirth by elective cesarean. Adequate care is to be taken by operating obstetrician during extraction of child and giving traction on the limb. It is prudent on the part of the operating obstetrician and pediatrician to initiate appropriate investigations and management on the slightest suspicion to prevent future deformities and disabilities.

### Conflict of Interest

Nil

## Consent

The authors confirm that informed consent was obtained from the patient for publication of this case report

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