



Bilateral Clavicle Fracture: A Rare Presentation of a Common Form of Orthopedic Birth Injury

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Abstract

A female newborn presented at day-1 with isolated right clavicle crepitus after vaginal delivery by certified nurse midwives. Shoulder dystocia was suspected at birth but delivery was successful with the sole aid of suprapubic pressure. The adequate weight-for-gestational-age female newborn (3605Gr. at 39Wk.) was vigorous at birth and no resuscitation was needed. Bilateral clavicle fracture was later confirmed by radiographic studies and associated birth injuries like brachial plexus paralysis were excluded during newborn physical exam screening. Outcome was favorable with complete recovery after three weeks of conservative treatment under orthopedic guidance.

Keywords

Birth injuries, Bone fractures, Clavicle, Neonate

Abbreviations

Gr: Grams, Wk: Weeks (postconceptional age)

Introduction

Bilateral clavicle fracture (CF) is a rare presentation of one of the most common forms of orthopedic birth injury [1,2]. Bilateral CF has been reported [3]. Unilateral CF incidence estimates vary greatly [1,4-7], especially if we consider undetected fractures at initial hospital discharge (up to 40% of all live births in some settings) [8]. Recent data point to an incidence of 0.6-1.6% of unilateral CF complicating vaginal delivery births [4-6].

CF is a benign and usually self-limiting injury resulting from mechanical stress forces applied to the fetus during the passage through the birth canal [7]. It is commonly associated with shoulder dystocia and to a lesser extent with brachial plexus injury, although the interrelation between these different entities has been difficult to interpret and is still under investigation [6].

CF may present with clavicular crepitus, palpable bony irregularity and sternocleidomastoid muscle spasm. Pain or discomfort may occur with variable degree of upper limb movement limitation. Moro reflex is usually absent or diminished but may be entirely normal. Peripheral nerve damage exclusion is mandatory as it has the potential to complicate an otherwise favorable prognosis. Radiographic studies confirm the fracture [9].

Incomplete diaphyseal fractures of the clavicle are the most common and frequently missed [3]. When misalignment occurs the medial fragment is pulled upwards by the action of the sternocleidomastoid muscle whereas the lateral fragment is pulled downward as a result of upper limb traction. Treatment is conservative. Fracture stabilization is not indicated in bilateral CF and/or thoracic trauma [9,10]. Associated nerve injury may require specific rehabilitation exercises and nerve reconstruction or nerve graft surgery in severe cases (avulsion) [11].

Other predisposing factors that contribute independently to increasing the risk of CF include fetal birth weight greater than 4250 Gr., advanced gestational age (> 42Wk.), protracted labor, multiparity and short second stage of labor [6]. Prophylactic use of the McRobert's maneuver with or without the application of suprapubic pressure has not proved superior to therapeutic obstetric maneuvers in preventing birth trauma and unfavorable outcomes in cases of shoulder dystocia [12]. Recent data suggest that clinicians should use the therapeutic maneuver most likely to result in a successful delivery [13].

Case Report

A 24 h year-old female newborn presented with isolated right clavicle crepitus on physical examination and displaced bilateral clavicle fractures on radiograph studies after vaginal delivery by certified nurse midwives. Although shoulder dystocia was suspected at the time no instrumentation was needed: delivery was successful after resorting to suprapubic pressure measures. The adequate weight-for-gestational-age newborn (3605 gr at 39wk) was vigorous at birth with no criteria for asphyxia (Apgar index: 9 at 1minute; 10 at 5 minutes) and no need for resuscitation. A complete physical exam was performed at day-1 with exclusion of associated birth injuries including peripheral nerve injury: active and passive limb movements were unaffected on both sides and did not elicit any pain or cause discomfort, Moro reflex and grasp reflex were both present and symmetrical. Gestation was uneventful.

The mother's obstetric history included a vacuum delivery of a healthy female baby (2700 gr at 38wk) four years earlier with no documented birth injuries. There was no other relevant family history.

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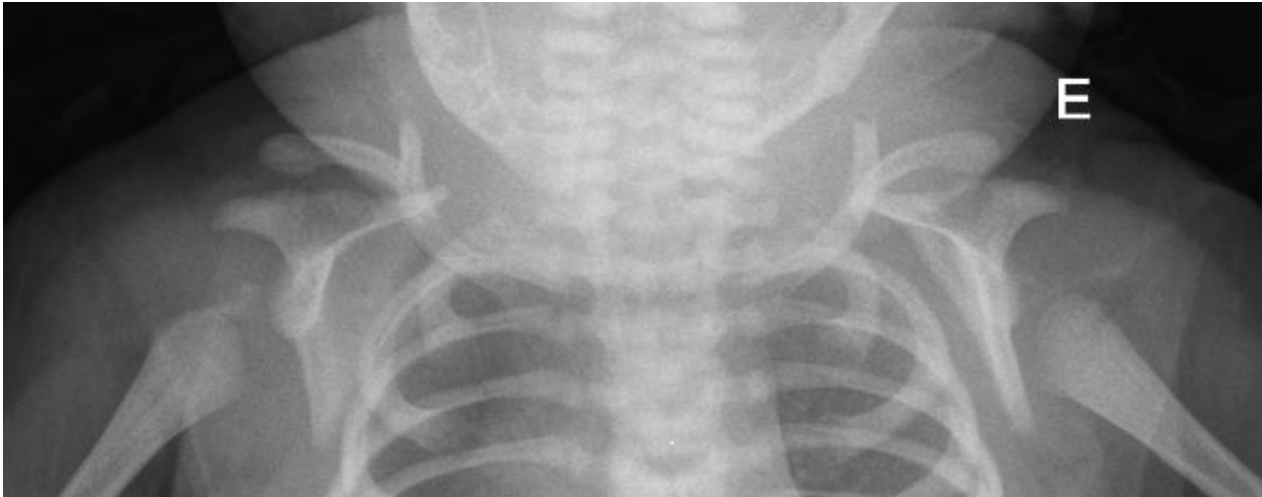


Figure 1: Newborn upper chest radiography at day 1 showing completely misaligned diaphyseal fractures on both clavicles.



Figure 2: Newborn upper chest radiography at day 21 showing consolidated diaphyseal fractures on both clavicles (bony callus).

Investigations

Clavicle radiographic studies confirmed a diagnosis of bilateral clavicle fracture. Bilateral misaligned diaphyseal clavicle fractures are visible on [figure 1](#).

Treatment

After orthopedic consultation conservative measures were proposed to the mother: minimal handling and avoidance of tight clothing until further clinical follow-up within three weeks. The newborn was discharged at day three.

Outcome and follow-up

Complete resolution of bone fracture was documented at three-weeks of age during orthopedic consultation ([Figure 2](#)). Neither bone distortion nor peripheral nerve damage were found. The baby was discharged from orthopedic consultation and neurodevelopment is to be assessed during regular paediatric follow-up.

Discussion

Bilateral CF fracture is a rare presentation of a common orthopedic birth injury, commonly associated with shoulder dystocia that is secondary to mechanical stress forces applied to the fetus in utero and most commonly during passage through birth canal [9,10]. Many fractures are undiagnosed at first hospital discharge as newborns are asymptomatic especially if there is no peripheral nerve damage as we verified in the reported case [8].

To our knowledge bilateral CF birth injuries reports are scarce and all report additional injuries. Kanik A, et al. [3] report a series of two macrosomic newborn babies with bilateral CF and associated brachial plexus palsy: the first male newborn (38wk, 4200 g - 97th percentile) presented with bilateral *Erb-Duchenne* paralysis with

complete recovery after two months of conservative treatment; the second male newborn (34wk, 3200 g - <97th percentile) presented with bilateral *Erb-Duchenne* paralysis and a small pneumomediastinum with complete recovery after two months of conservative treatment as well. Shoulder dystocia and normal birth-weight-for-age in our case are in accordance with the reported series; female gender and absence of associated birth injuries, especially brachial plexus paralysis, make our report rather unusual.

Published evidence of bilateral CF seems to suggest that fetuses may have been exposed to greater mechanical forces that predisposed them to additional birth injuries. We suspect similar cases of isolated bilateral CF may be under diagnosed as isolated unilateral CF has been well documented [6], or there may be some degree of report bias as prognosis is generally favorable for both unilateral and bilateral fractures [2].

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