Interdisciplinary Journal of Acute Care
Volume 3, July/December 2022, Issue 2, pp.69-72
Journal homepage: www.ijac.lums.ac.ir

Femur Fracture in Newborn with Breech Presentation During Cesarean Section: A Rare Case but Possible Complication

Fatemeh Janani[1]

[1]School of Nursing and Midwifery, Social Determinants of Health Research Center, Lorestan University of Medical Sciences, Khorramabad, Iran.

ABSTRACT

Cesarean section is considered safer than vaginal delivery in terms of the risk of birth injury, which is more common in vaginal breech deliveries. However, such injuries can still occur in cesarean section. Femur fracture is one of the most common fractures of the lower extremity observed among newborns, although it is a relatively rare complication. A 3780 gr male infant was delivered at 38 weeks and 5 days by elective cesarean section for breech presentation. The newborn sustained a fracture of the right femur. A simple limb immobilization in extension led to the complete healing of the fracture without sequelae. The case report aims to increase awareness of the clinical complications of femur fracture during breech extraction in cesarean section.

Keywords: Cesarean section; Breech presentation; Trauma; Femur fracture; Case report

Introduction

Improving the quality of maternity care and focusing on mothers' and newborns' health have recently become priorities for governments and international health organizations. Despite the maternity care improvements, birth trauma remains a significant cause of neonatal complications, especially in developing countries [1, 2].

The range of birth injuries varies from simple bruising, swelling, and scarring caused by delivery instruments to the loss of neurological and motor function or, rarely, fractures of bones [3].

Birth injuries are typically more common in vaginal deliveries. However, fetal injury during Cesarean Section (CS) is not unprecedented, occurring in 0.8% - 1.1% of cases. Although CS protects against certain types of injuries, scalp lacerations, cephalohematoma, and fractures of long bones, especially the femur, and humerus, are commonly observed due to the thinning of the lower uterine segment and the pressure exerted by the uterus to expel the fetus [4].

A large number of studies reported an increased incidence of perinatal mortality and morbidity in breech presentation compared to cephalic presentation. Furthermore, the presence of complicating factors associated with breech presentations, such as preterm fetus, intrauterine growth restriction (IUGR), malposition maternal pelvis, multiple gestations, and fetal anomalies, makes vaginal delivery more challenging and significantly increases the likelihood of birth injuries [5].

It is estimated that three-quarters of long bone fractures occur during fetal birth in breech presentation and during vaginal delivery. Long bone fractures are reported in 0.1% of cases during CS and 0.5% during vaginal delivery [6, 7].

Neonatal femur fracture is one of the complications associated with breech presentation during birth, with an incidence rate between 0.077- 0.130 per 1,000 deliveries. Vaginal delivery, compared to CS,

*Corresponding author: *Fatemeh Janani, School of Nursing and Midwifery, Social Determinants of Health Research Center, Lorestan University of Medical Sciences, Khorramabad, Iran. Email:* janani37@yahoo.com
DOI: 10.22087/ijac.2022.457894.1010

carries a higher risk of neonatal femur fracture [3, 8, 9].

Considering the international and national protocols, elective and planned CS is considered a safe method for the termination of pregnancy in cases of breech presentation, which can effectively reduce the incidence of birth trauma [10].

In most cases, explaining the occurrence of birth injuries is challenging, which may lead to medical and legal complications for physicians and healthcare providers. Therefore, healthcare providers should identify risk factors before delivery using appropriate methods and intervene at the right time to minimize medical and legal consequences [4]. A case of femur fracture is reported in a neonate undergoing elective CS due to the breech presentation in our tertiary care center, Khoramabad, Iran.

Patient presentation

A 34-year-old woman, gravida 7, with a history of three vaginal deliveries, three miscarriages, and three living children, was referred to the labor ward with complaints of labor pain. Based on her last menstrual period and the first-trimester ultrasound, the patient's gestational age was determined to be 38 weeks and 5 days. No fetal abnormalities were reported on ultrasound, except for breech presentation.

The parents had no history of consanguinity or genetic disease, according to their statements, and the mother did not report any medical history during the pregnancy. Based on the vaginal examination, the patient was not in the active phase of labor. Given the term pregnancy and breech presentation, the client was administered spinal anesthesia, and a CS was performed with a lower uterine segment incision to terminate the pregnancy. A male neonate weighing 3,780 gr was delivered and immediately cried. The Apgar score at one and five minutes was 9.10 and 10.10, respectively. The neonate was immediately examined after birth, and no abnormal signs were observed.

On the second day of life, the mother reported bruising and swelling of the neonate's right thigh, accompanied by pain and tenderness upon palpation.

The right femoral fracture and dislocation were diagnosed through an orthopedic consultation, lower extremity ultrasound, and radiographs (anteroposterior and lateral views of the femur, Figs. 1 and 2). The bone structure appeared normal. The levels of serum calcium, phosphorus, and alkaline phosphatase were within normal limits.

The neonate was immediately transferred to the neonatal intensive care unit (NICU) and examined by an orthopedic specialist. The neonate was placed in a short leg splint, with traction and immobilization of the leg.

The neonate was hospitalized for three days and subsequently discharged with medical care instructions, parental counseling, and recommendations for weekly follow-up visits.

The neonate's general condition was stable during the hospitalization, and breastfeeding was normal.

A three-month follow-up evaluation showed uncomplicated healing of the right femur fracture. Based on the study reports, the average time interval from birth to diagnosis of the fracture was 1.5 days; in this case, the fracture was diagnosed on the second day of life.

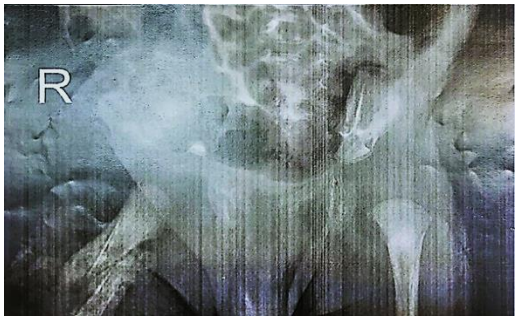

Figure 1. Lower limb radiograph in AP view

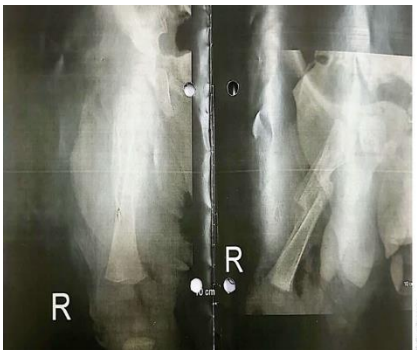

Figure 2 - Lateral view of the infant's lower limb

Discussion

Fetal bone fractures during CS have been reported rarely. The fractures of the femur, skull, tibia, forearm, and, less commonly, the humerus have been documented in challenging extractions, especially in breech deliveries [11]. Breech presentation, accounting for approximately 3–4% of fetal presentations, is recognized as a risk factor for perinatal morbidity and mortality. While vaginal delivery in breech presentation poses a higher risk of femoral fractures compared to CS, such injuries have been reported rarely during CS [11, 12].

Basha et al., in a ten-year retrospective study conducted at a teaching hospital, evaluated the frequency and outcomes of neonatal long bone fractures. Their findings highlighted prematurity, abnormal fetal presentations, and multiple pregnancies as contributing factors to long bone fractures. Furthermore, the aforementioned study identified femoral fractures as the most prevalent type of fracture associated with CS [4], as failure to diagnose these fractures promptly can lead to severe consequences, ranging from damage to surrounding soft tissues (e.g., vessels, nerves, and muscles) to disruption of femoral bone growth, and subsequently mobility disorders, disability, and chronic pain in the affected limb [13].

Femoral fractures during CS can occur due to excessive traction of the lower extremities or difficulty extracting the fetus from the uterus, accompanied by abnormal sounds, such as a "click," during fetal delivery. However, these fractures may go undiagnosed initially due to the absence of overt symptoms. In the present study, the femoral fracture and dislocation diagnosis was confirmed on the second day of life [9].

Similar studies categorized the diagnosis of neonatal long bone fractures, including femoral fractures, into early diagnosis immediately after birth and delayed diagnosis occurring days after delivery groups [12].

Some predisposing factors contributing to femoral fractures during CS include low or high birth weight, advanced maternal age, preterm delivery, uterine fibroids, emergency CS, abnormal presentations, abnormal fetal positioning, and multiple gestation. [9]

The maneuvers performed during CS, along with small uterine incisions or inadequate uterine relaxation, may lead to fetal limb fractures during extraction. In addition, complications such as fetal entrapment within the pelvis in breech presentations, especially incomplete breech presentations, are recognized as risk factors associated with femoral fractures during CS [6].

Implementing precise fetal evacuation maneuver technique during CS, ensuring adequate analgesia and uterine relaxation, and exercising caution during fetal evacuation can significantly reduce the likelihood of fetal limb injuries and associated trauma [9].

It is recommended to minimize the risk of such injuries to avoid excessive traction during fetal delivery, which can be hazardous, and instead ensure that the uterine incision is sufficiently extended [6, 14].

The surgical team's vigilance in identifying abnormal auditory cues, such as a "click" during neonatal delivery, with prompt clinical examination and radiographic and ultrasonographic imaging, is essential for the timely diagnosis and management of femoral fractures [9]. Although multiple therapeutic approaches exist for treating femur fractures, limb immobilization typically leads to full recovery.

Conclusion

The likelihood of birth injuries in breech presentation is rare but possible during CS compared to vaginal delivery. Identifying risk factors and predispositions plays a pivotal role in preventing and reducing birth-related injuries such as femoral fractures. The thorough examination of neonates in the initial hours of life by pediatric specialists and the medical team is essential, especially in breech presentation, for timely diagnosis and management of birth-related injuries.

References

1. World Health Organization. WHO recommendation on respectful maternity care during labour and childbirth. Geneva: World Health Organization. 2018.

2. Guidelines Review Committee M, Newborn, Child & Adolescent Health & Ageing (MCA), Sexual and Reproductive Health and Research (SRH). WHO recommendations: intrapartum care for a positive childbirth experience 2018. Available from: https://www.who.int/publications/i/item/9789241550215.

3. Chaturvedi A, Chaturvedi A, Stanescu AL, Blickman JG, Meyers SP. Mechanical birth-related trauma to the neonate: An imaging perspective. Insights into imaging. 2018 Feb;9:103-18.

4. Meshram RM, Shinde SS, Mahajan SV, Gholap S, Nayak AD. Fracture of humerus in a newborn during cesarean section: A case report. Indian Journal of Case Reports. 2019 Nov 28;5(6):533-5.

5. Rehm A, Promod P, Ogilvy-Stuart A. Neonatal birth fractures: a retrospective tertiary maternity hospital review. Journal of Obstetrics and Gynaecology. 2020 May 18;40(4):485-90.

6. Ulici A, Herdea A, Dragomirescu MC, Lungu CN. Obstetric fractures in caesarean delivery and risk factors as evaluated by paediatric surgeons. International Orthopaedics. 2022 Nov;46(11):2611-7.

7. Awariwar MD, Iqbal MS, Jayamol MA, Bhat V. Management of a neonatal femoral shaft fracture following breech presentation: A case report. Journal of Marine Medical Society. 2022 Jul 1;24(Suppl 1):S104-6.

8. Kancherla R, Sankineani SR, Naranje S, Rijal L, Kumar R, Ansari T, Trikha V. Birth-related femoral fracture in newborns: risk factors and management. Journal of children's orthopaedics. 2012 Jul;6(3):177-80.

9. Papi L, Gori F, Turco S, Perutelli A. Femoral fracture during cesarean section: a case of professional liability? Case presentation and review of the literature. Archives of Clinical and Medical Case Reports. 2019;3(5):242-9.

10. Savchenko J, Lindqvist PG, Wendel SB. External cephalic version for breech presentation: The guideline landscape and a quest for an optimal approach. European Journal of Obstetrics & Gynecology and Reproductive Biology. 2020 Dec 1;255:197-202.

11. Dave PK, Chouhan P, Gupta V, Mishra R, Jain M, Bapat M, Tilgam M, Patidar A, Patil P, Dave C, Faruqui SA. Caesarean section and left femur fracture in breech presentation in a primipara. New Indian J Obgyn. 2020;7(1):102-4.

12. Vellingiri K, Venkataraman S, Shanthappa AH, Seenappa H. Femur shaft fracture in newborns: a report of two cases. Cureus. 2021 Jan 5;13(1).

13. Kanai Y, Honda Y, Honda T, Sanpei M. Delayed birth-related femur fracture after cesarean section: a case report. American Journal of Perinatology Reports. 2018 Jul;8(03):e158-60.

14. Curtelin C, Delille E, Bailly C, Equy V, Hoffmann P, Courvoisier A, Riethmuller D. Femoral fracture during breech vaginal delivery: A case report. Journal of Gynecology Obstetrics and Human Reproduction. 2022 Mar 1;51(3):102310.