

Bilateral Intertrochanteric Femoral Fractures in an 11-Month-Old Infant: A Case Report

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ABSTRACT

Pediatric hip fractures are exceedingly rare, accounting for less than 1% of all pediatric fractures. Bilateral intertrochanteric femoral fractures in an infant are almost unheard of and raise significant concern for underlying causes such as high-energy trauma or non-accidental injury. We report an 11-month-old male infant who presented with bilateral intertrochanteric femur fractures under suspicious circumstances. The child's history was inconsistent with the injury pattern, prompting evaluation for non-accidental trauma. The infant was managed with prompt closed reduction and application of a bilateral hip spica cast. A full skeletal survey and metabolic workup were performed to identify any additional injuries or predisposing conditions. The fractures healed uneventfully after six weeks of immobilization, with follow-up showing satisfactory alignment and no complications. Investigations for osteogenesis imperfecta and other bone fragility disorders were negative. Child protection authorities were notified given the high suspicion of abuse. This case highlights an extremely rare presentation of simultaneous bilateral intertrochanteric fractures in an infant. It underscores the importance of considering child abuse in such scenarios, performing thorough evaluations to exclude underlying pathology, and instituting timely, appropriate management to achieve good outcomes.

Keywords: Pediatric hip fractures, Bilateral intertrochanteric femur fractures, non-accidental trauma, Child abuse, Infant



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1. Introduction

Hip fractures in children are exceptionally uncommon, comprising well under 1% of pediatric fractures (1). Such injuries typically result from high-energy trauma (e.g. motor vehicle accidents or falls from a significant height); a low-energy mechanism in a young child should prompt careful evaluation for underlying pathology or non-accidental trauma (1). Bilateral intertrochanteric femoral fractures in a child have been reported only a few times in the literature and are extraordinarily rare (2). To our

knowledge, bilateral intertrochanteric fractures in an infant of 11 months have not been previously reported in the context of possible child abuse.

Infants of this age are not yet ambulatory, and any femoral fracture in a non-walking child is highly concerning for non-accidental injury (3). In fact, studies have estimated that between one-quarter and over one-half of fractures in infants under one year of age may be caused by physical abuse (4).

No single fracture type is pathognomonic for abuse; instead, the overall injury pattern, the child's developmental ability, and the history provided must be considered (3, 5). Certain injury patterns – such as multiple fractures at different stages of healing, classic metaphyseal lesions (corner fractures), posterior rib fractures, or fractures of the scapula or outer clavicle – are strongly suggestive of non-accidental trauma in infants (5).

Given the potential dire consequences of missing an abusive injury, physicians must maintain a high index of suspicion when young children present with unusual or bilateral fractures (3, 6). We present here the case of an 11-month-old infant with bilateral intertrochanteric femur fractures, managed successfully with casting, and discuss the investigative approach and management considerations in light of this case. This study is a single-patient descriptive case report of an infant diagnosed with bilateral intertrochanteric femoral fractures.

Clinical data were collected retrospectively from the patients' medical records including demographic information, clinical presentation, imaging, laboratory findings, treatment, and follow-up outcomes. Radiographic evaluation includes anteroposterior pelvic and femur radiographs at presentation and during follow up. A complete skeletal survey was performed according to international guidelines for suspected non-accidental trauma in infants. The patient was followed clinically and radiographically for a minimum of four months after treatment to evaluate fracture healing.

2. Case Presentation

An 11-month-old male infant was brought to the emergency department by his mother with an inability to

move both legs after an incident earlier that day. The mother reported that the baby had “fallen off a low sofa onto the floor.” However, the mechanism as described appeared inconsistent with the severity of the injuries observed. The infant was crying inconsolably on presentation. Physical examination revealed pain, swelling, and tenderness localized to both proximal thighs and hips. There were no external bruises or skin marks around the hips or elsewhere on the body. The child was otherwise healthy with no prior medical history. Initial neurovascular examination of the lower extremities was normal. Given the atypical presentation, a thorough evaluation for possible non-accidental trauma was initiated in parallel with injury management. Radiographic evaluation demonstrated bilateral intertrochanteric femoral fractures. The anteroposterior pelvis X-ray showed transverse fractures through the intertrochanteric regions of both femurs with mild displacement. No other bony injuries were evident on the pelvis film. A full skeletal survey was performed according to standard guidelines for infants with suspicious injuries (4, 6). The survey did not reveal any old healing fractures or additional acute injuries. In particular, there were no rib fractures, vertebral compression fractures, or limb fractures apart from the bilateral proximal femurs. Laboratory investigations, including serum calcium, phosphate, alkaline phosphatase, and vitamin D levels, were within normal ranges.

There were no clinical stigmata of osteogenesis imperfecta (such as blue sclerae or dentinogenesis imperfecta), and thus heritable bone fragility was considered unlikely. The clinical and investigative workup therefore, pointed toward trauma as the cause of the fractures, with a strong concern for inflicted injury given the history and age.

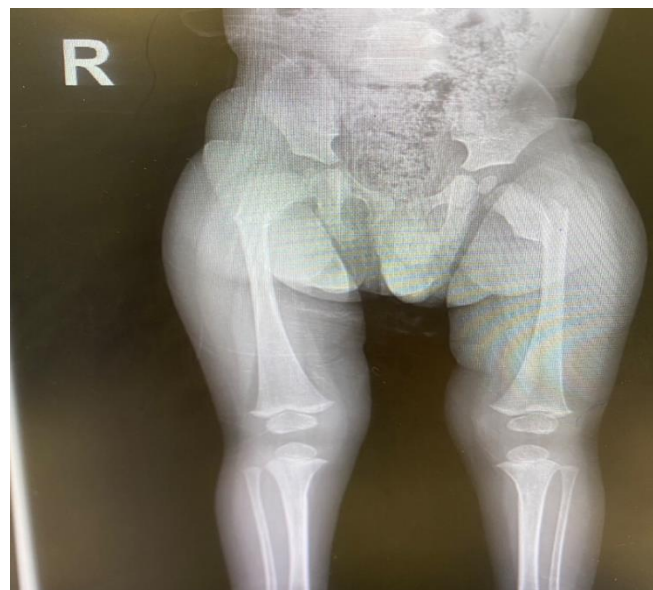


Figure 1. Preoperative radiograph showing bilateral intertrochanteric fractures. (Prepared by Authors, 2026).

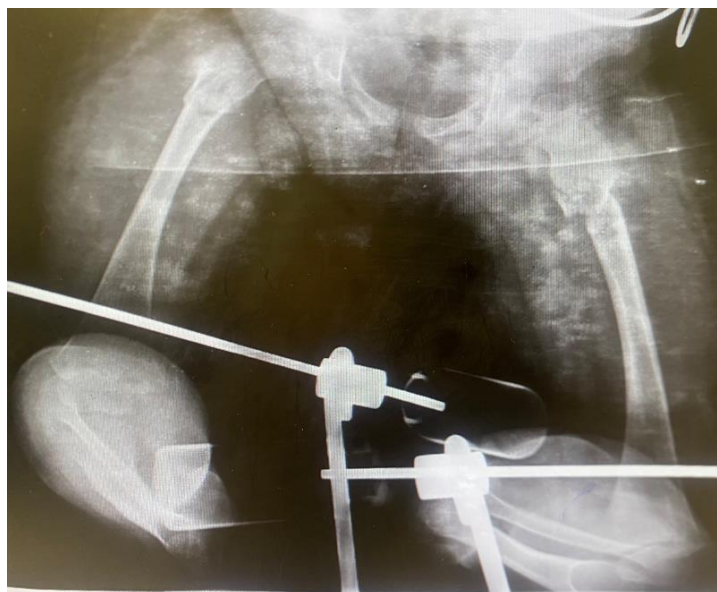


Figure 2. Post-treatment radiograph after placing bilateral distal femoral pin. (Prepared by Authors, 2026).



Figure 3. Post-treatment ap radiograph after 7 days from trauma. (Prepared by Authors, 2026).



Figure 4. post-treatment lateral radiograph after 7 days from trauma. (Prepared by Authors, 2026).

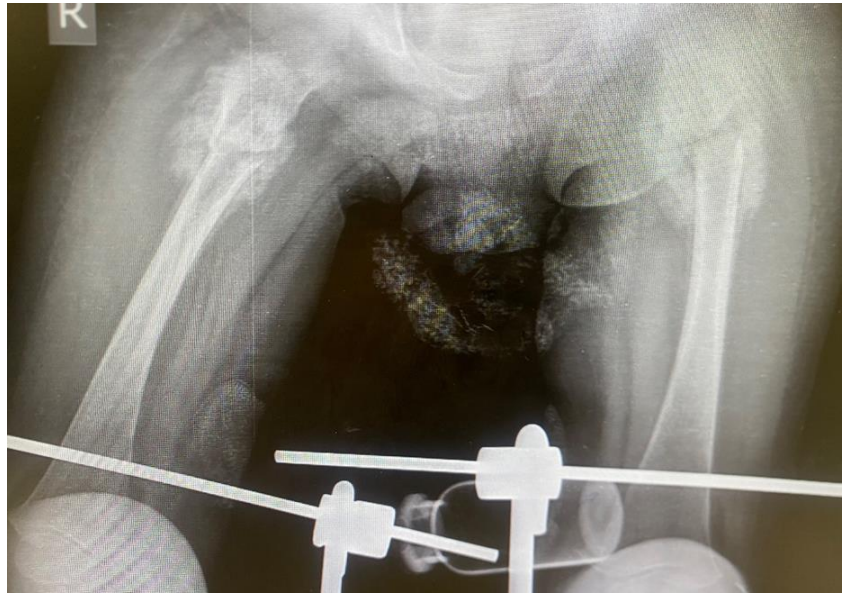


Figure 5. Post-treatment ap radiograph after 14 days from trauma. (Prepared by Authors, 2026).



Figure 6. Post-treatment ap radiograph after 20 days from trauma. (Prepared by Authors, 2026).



Figure 7. Post-treatment lateral radiograph after 20 days from trauma. (Prepared by Authors, 2026).

The orthopedic management was planned promptly. Under general anesthesia bilateral proximal femoral pin was placed for traction. Then a 1 kg weight was tied to the traction on each side and it was under traction for 2 weeks and then it was placed in the operating room under brief anesthesia and a spica cast was placed. The infant underwent a gentle closed reduction of both femoral fractures. Satisfactory alignment was achieved bilaterally

by manipulation under fluoroscopic guidance. A bilateral hip spica cast was then applied, with the hips immobilized in approximately 45° of flexion and moderate abduction to maintain reduction. Post-reduction X-rays confirmed the acceptable position of the fracture fragments on both the right and left sides. The child was kept for observation in the hospital overnight and had an uneventful immediate postoperative course.



Figure 8. Post-treatment radiograph after 6 week showing alignment and hip spica cast in place. (Prepared by Authors, 2026).

The hip spica cast was maintained for a total of six weeks. During this period, the family was instructed on cast care and encouraged to ensure the child's comfort and nutrition to optimize healing. At the six-week follow-up, the cast was removed and repeat radiographs demonstrated complete fracture union bilaterally with abundant callus bridging the fracture sites. The alignment of the femoral neck and shaft on both sides was near-anatomic, with normal neck-shaft angles on both sides. The infant's hip range of motion was gently tested and found to be developing appropriately, with no signs of pain. The child was observed over the next several weeks to gradually return to painless spontaneous movements of the lower limbs.

By three months post-injury, he had resumed crawling and pulling to stand without apparent difficulty. Leg lengths were equal and there were no clinical signs of avascular necrosis of the femoral heads at the latest follow-up (four months post-injury).

In parallel with fracture management, the case was investigated for potential non-accidental trauma. Given the inconsistency of the injury with the history provided, hospital authorities activated a child protection team. Social service and law enforcement agencies were notified. The infant's mother eventually admitted that the explanation given initially was incomplete.

While details remain under investigation, it was acknowledged that the child may have been handled roughly by a caregiver. The case was managed as

suspected physical abuse. The child was discharged to the care of a relative under supervision while child protective services continued further evaluation.

4. Discussion

Bilateral intertrochanteric fractures in an infant represent an extremely rare injury pattern. Pediatric hip fractures of any kind are scarce, especially in children under one year of age (1). Gilban et al. reported a previous case of simultaneous bilateral cervico-trochanteric (basicervical) femoral fractures in a child, which was attributed to high-energy accidental trauma.

(2, 7). Our case appears unique as it involves bilateral true intertrochanteric fractures in an infant, with a strong suspicion of non-accidental trauma as the cause. Infants of 11 months are not ambulatory; therefore, it is highly unusual for such severe injuries to occur in the absence of either a major accident or inflicted force. Clinicians must be vigilant in such scenarios. Any femoral fracture in a non-walking child should prompt an evaluation for non-accidental trauma (3, 8). In our case, the red flags included an implausible history and bilateral injury, which raised immediate concern.

When evaluating possible child abuse cases, a careful and thorough approach is required. A detailed history is essential, and discrepancies or delays in seeking care should heighten suspicion (3). On examination, one should look for bruises or other signs of trauma that might be hidden by clothing (3). In infants, bruising can be subtle or absent even in the presence of fractures (3, 5). A

skeletal survey is a critical investigation in all children under two years of age with suspicious fractures, as recommended by pediatric guidelines (4, 6). This series of radiographs can identify old fractures in various stages of healing, which are highly indicative of past abuse (4, 6). In more than 70% of abused infants under one year, multiple fractures of differing ages are present on imaging (1). In our patient, the skeletal survey fortunately did not reveal additional injuries.

Differential diagnoses for multiple unexplained fractures in infancy include not only trauma (accidental or inflicted) but also conditions predisposing to bone fragility. Osteogenesis imperfecta is one of them. However, OI is usually accompanied by characteristic features (6). Our patient lacked these features, and laboratory tests showed normal bone metabolism, effectively ruling out OI and metabolic bone disease. Certain rare conditions like congenital insensitivity to pain were also considered; in this disorder, infants may suffer injuries due to a lack of pain perception, but our patient had normal pain responses (1). A comprehensive evaluation excluded these alternative causes and supported the conclusion that the injuries were traumatic in origin. Given the strong suspicion of non-accidental injury (NAI), it was imperative not only to treat the fractures but also to protect the child from potential further harm (3). Timely reporting and intervention can prevent such outcomes. In our case, the involvement of child protective services led to safeguarding measures for the infant. The identification of abuse, if confirmed, allows for appropriate legal actions and counseling for the family. Even as physicians focus on the orthopedic management, they have a duty to report suspected child abuse to authorities as part of comprehensive care (4, 6).

Historically, treatment of pediatric hip fractures often involved immobilization in spica casts or traction, but outcomes were poor and complication rates high with non-operative management (1). Complications of these injuries include avascular necrosis (osteonecrosis) of the femoral head, coxa vara (varus malalignment of the femoral neck), non-union, malunion, and premature closure of the growth plate leading to limb length discrepancy (1, 9). In the established classification of pediatric hip fractures by Delbet, our patient's fractures are type IV (intertrochanteric) injuries. Type IV intertrochanteric fractures have a much lower incidence of AVN (on the order of 10–15%) compared with Delbet type I (9). Nevertheless, any pediatric hip fracture must be treated urgently to minimize the risk of AVN and other complications. Evidence suggests that achieving an anatomic reduction and stable internal fixation within 24 hours of injury is the current standard of care for displaced pediatric proximal femur fractures (9, 10). Early operative management has been associated with improved outcomes and a reduced rate of complications (9, 10).

In our patient, we achieved an excellent reduction with a traction and hip spica cast, avoiding surgical fixation. Casting in this age group can be successful, given that infants have rapid healing and a large remaining growth

potential to correct minor residual angulation. That said, closed reduction in small children should be performed with care, and if a satisfactory alignment cannot be obtained or maintained in a cast, surgical fixation (for example, with flexible intramedullary nails or pins) may be necessary even in infants. In a similar reported case of bilateral proximal femur fractures in a slightly older child, open reduction and internal fixation with elastic nails were utilized because closed methods did not achieve adequate alignment (2, 10). Our case demonstrates that conservative management by traction and spica casting can result in excellent healing for bilateral intertrochanteric fractures in an infant, provided that reduction is successful and closely monitored. Throughout treatment, vigilant follow-up is required. We monitored our patient for signs of AVN of the femoral head (such as loss of hip motion or radiographic changes), as well as for coxa vara deformity. At four months post-injury, there were no clinical or radiographic indications of AVN, and the femoral neck angles were within normal limits, indicating that serious complications were avoided.

5. Conclusion

Bilateral intertrochanteric femoral fractures in an infant are exceedingly rare and should raise immediate concern for severe trauma or non-accidental injury. This case underscores the necessity of considering child abuse in unusual pediatric fracture presentations. A thorough evaluation – including skeletal survey and metabolic workup – is essential to distinguish accidental trauma from possible abuse and to rule out underlying bone disorders. Early, aggressive management of the fractures, with anatomic reduction and appropriate immobilization or fixation, can result in successful healing even in very young patients. By promptly recognizing the red flags of non-accidental trauma and coordinating with child protection services, healthcare providers can not only treat the injuries but also help safeguard the child's well-being. Timely intervention and multidisciplinary management were key to the favorable outcome in this infant's case, highlighting important lessons for clinicians faced with similar presentations.

6. Declarations

6.1 Acknowledgments

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6.2 Ethical Considerations

Written informed consent was obtained from the patient's parents for publication of this case report and accompanying images. The study was conducted in

accordance with the principles of the Declaration of Helsinki.

6.3 Authors' Contributions

A.N. managed the patient, conceived the study, and supervised the manuscript. S.S. contributed to the literature review, interpretation of clinical findings, and critical revision of the manuscript. S.R.A. collected the clinical data, prepared the manuscript draft, and coordinated the submission process. All authors read and approved the final version of the manuscript and accepted responsibility for the integrity of the work.

6.4 Conflict of Interest

The authors declare that they have no conflicts of interest regarding the publication of this article.

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6.6 Using Artificial Intelligence Tools (AI Tools)

Artificial intelligence (AI) tools were used only for language editing and improvement of the manuscript. All scientific content, clinical interpretation, and final revisions were performed and approved by the authors, who take full responsibility for the accuracy and integrity of the manuscript.

References

1. Dial BL, Lark RK. Pediatric proximal femur fractures. *J Orthop.* 2018;15(2):529-35. [DOI:10.1016/j.jor.2018.03.039] [PMID] [PMCID]
2. Gilban HM, Mirdad TM, Jenyo M. Simultaneous post traumatic bilateral cervico-trochanteric femoral neck fractures in a child: a case report. *West Afr J Med.* 2005;24(4):348-9. [DOI:10.4314/wajm.v24i4.28235] [PMID]
3. Kocher MS, Kasser JR. Orthopaedic aspects of child abuse. *J Am Acad Orthop Surg.* 2000;8(1):10-20. [DOI:10.5435/00124635-200001000-00002] [PMID]
4. Chauvin-Kimoff L, Allard-Dansereau C, Colbourne M. The medical assessment of fractures in suspected child maltreatment: Infants and young children with skeletal injury. *Paediatr Child Health.* 2018;23(2):156-60. [DOI:10.1093/pch/pxx131] [PMID] [PMCID]
5. Jayakumar P, Barry M, Ramachandran M. Orthopaedic aspects of paediatric non-accidental injury. *J Bone Joint Surg Br.* 2010;92(2):189-95. [DOI:10.1302/0301-620X.92B2.22923] [PMID]
6. Flaherty EG, Perez-Rossello JM, Levine MA, Hennrikus WL. Evaluating children with fractures for child physical abuse. *Pediatrics.* 2014;133(2):e477-89.
7. Scherl SA, Miller L, Lively N, Russinoff S, Sullivan CM, Tornetta P, 3rd. Accidental and nonaccidental femur fractures in children. *Clin Orthop Relat Res.* 2000(376):96-105. [DOI:10.1097/00003086-200007000-00014] [PMID]
8. Baldwin K, Pandya NK, Wolfgruber H, Drummond DS, Hosalkar HS. Femur fractures in the pediatric population: abuse or accidental trauma? *Clin Orthop Relat Res.* 2011;469(3):798-804. [DOI:10.1007/s11999-010-1339-z] [PMID] [PMCID]
9. Bali K, Sudesh P, Patel S, Kumar V, Saini U, Dhillon MS. Pediatric femoral neck fractures: our 10 years of experience. *Clin Orthop Surg.* 2011;3(4):302-8. [DOI:10.4055/cios.2011.3.4.302] [PMID] [PMCID]
10. Loder RT, Feinberg JR. Orthopaedic injuries in children with nonaccidental trauma: demographics and incidence from the 2000 kids' inpatient database. *J Pediatr Orthop.* 2007;27(4):421-6. [DOI:10.1097/01.bpb.0000271328.79481.07] [PMID]