

A Rare Case Report on Bilateral Intertrochanteric Fractures in a Child Following Child Abuse

RAGHAVENDRA S KEMHAVI¹, BOBLEE JAMES²

ABSTRACT

Diagnosis of non accidental injury needs careful history elicitation, proper examination and thorough workup including blood investigation and radiological assessment to avoid misdiagnosis or under diagnosis. Correct diagnosis and reporting would avoid possible similar incidents in the future. Four-year-old female child brought to our hospital by her mother with apparent history of fall from height. Following detailed examination and radiological assessment we suspected of child abuse. Child had multiple fractures in different stages of healing which included bilateral intertrochanteric fractures. Child was operated for bilateral intertrochanteric fractures which appeared relatively fresh compared to other old malunited fractures with open reduction and fixation with titanium elastic nailing and was immobilized by hip spica. Two months postoperatively, there was complete radiological union of fractures and child was being counseled by child psychologist.

Keywords: Corner fracture, Hip fracture, Hip spica, Physeal injury

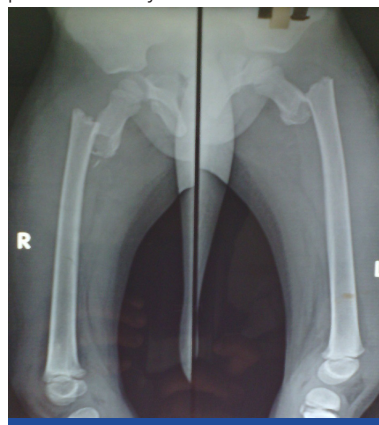
CASE REPORT

Four-year-old girl child was brought to our casualty by her mother with history of pain and deformity over both upper thighs and inability to walk following history of fall from heights as told by mother. We admitted the child on emergency basis without suspecting foul play. On examination there were deformities over both upper thighs associated with significant tenderness. There was pain and tenderness over dorsolumbar junction. There were no obvious external skin injuries. There were no distal neurovascular deficits. Further careful examination revealed deformities over right elbow with bony irregularities over right supracondylar humerus region. Similar bony irregularities were seen on left elbow as well as left knee though there were no deformities over these regions. All these signs of multiple fractures at different duration, made us to think in terms of child abuse. However, we did not find skin bruises on any part of the body. Retrospectively when we tried eliciting detailed history from the mother, it never looked convincing and correlating with nature of injury and also, history-telling by her varied from examiner to examiner. She adamantly denied being involved in child abuse. There appeared delay in seeking medical attention also with present and past injuries. Radiological assessment almost gave us confirmation of child abuse. It showed multiple fractures at different stages of healing. It showed bilateral intertrochanteric fractures (Delbet type IV) [Table/Fig-1,2] and D11 vertebral minimal

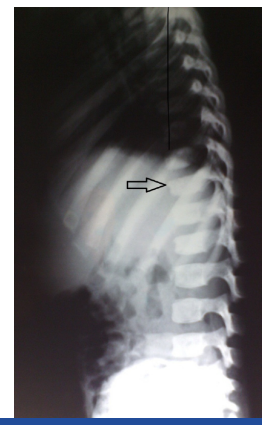
wedge compression fractures [Table/Fig-3] which appeared relatively fresh compared to other fractures. Other fractures which appeared old radiologically were right sided malunited supracondylar humerus fracture [Table/Fig-4a&b], left proximal ulnar fracture [Table/Fig-5] and right sided united proximal tibial metaphyseal fracture with physeal injury [Table/Fig-6a&b]. In a child with multiple fractures, differential diagnosis includes accidental trauma, non accidental trauma, osteogenesis imperfecta, metabolic bone disease and congenital insensitivity to pain [1]. Specific radiological features like multiple fractures in different stages of healing, metaphyseal fractures, bilateral fractures, vertebral fractures and long bone fractures which are classically described in nonaccidental trauma made us to differentiate from accidental trauma. Osteogenesis imperfecta was ruled out easily by absence of typical radiological features seen in that condition, absence of blue sclera, normal dentition and absence of family history. Serum calcium, phosphorus and alkaline phosphatase levels were normal ruling out metabolic bone disease. Child had sensitivity to pain and other sensations and hence congenital insensitivity syndrome was ruled out. Considering suspicious history and radiological findings, we strongly considered child abuse and police was informed. After thorough investigation by them, mother accepted that she was aware of abuse on her child and the crime was committed by her male neighbour. Both are in police custody as of now.



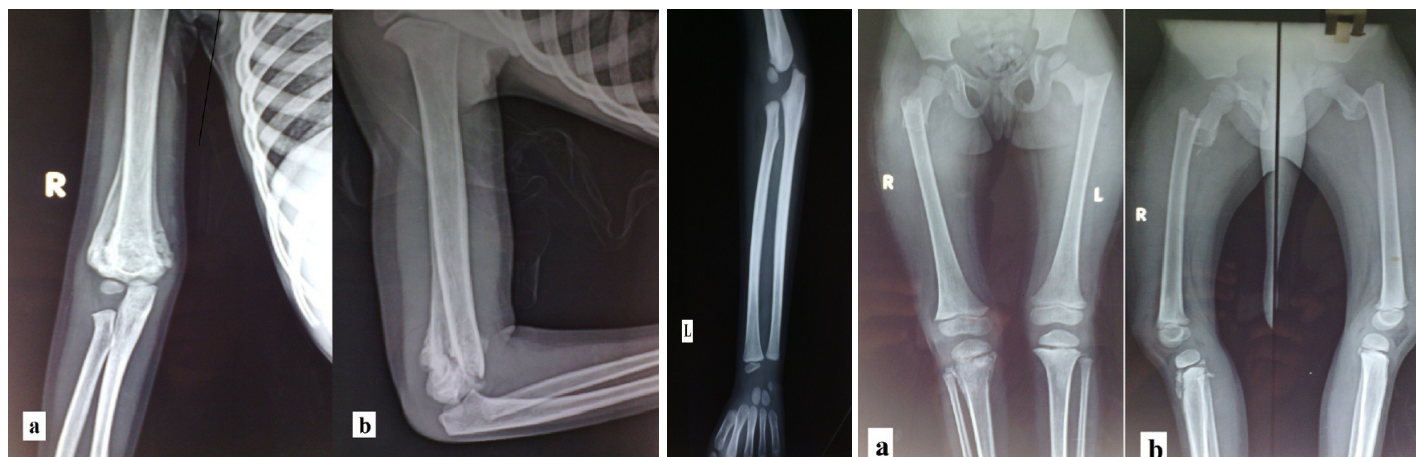
[Table/Fig-1]: Pelvis radiograph showing bilateral intertrochanteric fractures, displaced



[Table/Fig-2]: Lateral radiograph of both hip showing distal fragment in flexion relation to proximal fragment



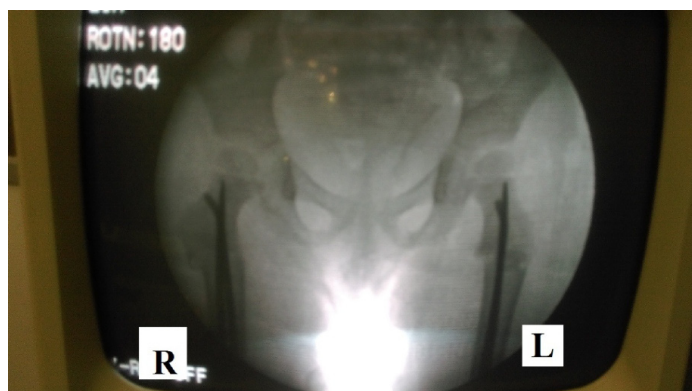
[Table/Fig-3]: Lateral dorsolumbar spine radiograph showing minimal compression fracture at D11 vertebra (arrow)



[Table/Fig-4a,b]: Anteroposterior and lateral radiographs of right elbow showing old malunited supracondylar humerus fracture

[Table/Fig-5]: Showing left proximal ulnar united fracture

[Table/Fig-6a,b]: Anteroposterior and lateral radiographs of both lower limbs showing malunited proximal tibial metaphyseal fracture with physeal injury on right side



[Table/Fig-7]: Showing intraoperative fluoroscopic picture showing fracture fixation using titanium nail



[Table/Fig-8]: Postoperative radiograph at six weeks showing complete fracture union at bilateral intertrochanter with titanium nail in situ

Meanwhile after thorough workup, child was operated with open reduction and internal fixation of fractures with titanium elastic nail of 3mm size since by closed reduction we could not reduce fracture [Table/Fig-7]. Postoperatively child was immobilized with hip-spica. Wedge compression at D11 vertebra was managed conservatively. Older fractures at right supracondylar humerus, left proximal ulna and right proximal tibia were managed conservatively. Child was followed up for two months postoperatively. Six weeks postoperatively, hip spica was removed and plain radiograph showed complete fracture union [Table/Fig-8]. Surgical wounds healed completely. Child was started on in-bed mobilization at six weeks. Gait training has been initiated. Psychological therapy with the help of counselor has also been provided.

DISCUSSION

Child abuse is important health issue globally which can lead to significant physical and psychological morbidity in children. Worst part about child abuse is most incidents are unreported. Child abuse can be in the form of physical, sexual, psychological or neglect. Proper history elicitation and careful examination is required before coming to a conclusion of child abuse since it is a sensitive issue. No parent will volunteer that they have abused their own child. Examiner should always be suspicious when history does not match with a nature and magnitude of injury. When honest history is difficult to elicit to arrive at correct diagnosis, investigative modalities like blood investigations and radiological assessment will be helpful in arriving at proper diagnosis. In our case too, initial history telling by mother always seemed suspicious. But radiological studies along with blood investigations with retrospective history elicitation from parent with aid of police helped us to arrive at correct diagnosis.

Child abuses are misdiagnosed or underdiagnosed many times. But each time we come across such incidents, it is always better to document and report since repeat occurrences of such acts are seen in 30-50% of patients [2]. In our case too, abuse had reoccurred since it was left unreported in the beginning. Abuse can occur at any age though most commonly seen in infants [3]. Most common manifestations of child abuse are bruises followed by fractures. In our case we did not notice bruises which could be due to delayed presentation of patient to hospital or could be due to blunt force trauma where bruises are unlikely, like in fistful injuries or following stepping on the person. Fractures seen in child abuse are characteristic though no fracture is pathognomonic. However, multiple fractures at different stages of healing, metaphyseal fractures (corner fractures), posterior rib fractures, vertebral fractures, skull fractures, scapular fractures and lateral end of clavicle fractures can be highly indicative of non accidental injuries [4].

Paediatric hip fractures are rare and constitute less than 1% among paediatric fractures. Bilateral intertrochanteric fractures in children are very rare and have been reported very few times in literature [5]. However, so far to best of our knowledge such bilateral injury has never been reported following non-accidental injury. Delbet classified hip fractures into four types. Type-I fractures are transepiphyseal separations, with or without dislocation of the femoral head from the acetabulum, type II are transcervical, type III are cervicotrochanteric and type IV are intertrochanteric fractures. Though incidence of paediatric hip fractures are low, they need proper treatment since they are associated with high incidences of complications like avascular necrosis of head of femur, coxa vara, nonunion, premature physeal closure, delayed union and shortening of limb [6]. Incidence of avascular necrosis of head of femur is 100% in type I, 50% in type II, 27% in type III and 14% in type IV Delbet's fractures.

Incidence also depends on initial displacement of fracture, age and time of surgery [7].

CONCLUSION

Bilateral intertrochanteric fractures in a child are rare injuries following accidental injury or following child abuse. To avoid misdiagnosis or underdiagnosis of child abuse, proper history taking, careful examination and investigative modalities like blood investigations and radiological assessment are required.

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REFERENCES

- [1] Flaherty EG, Perez-Rossello JM, Levine MA, et al. Evaluating children with fractures for child physical abuse. *Pediatrics*. 2014;133:e477.
- [2] Kocher MS, Kasser JR. Orthopaedic aspects of child abuse. *J Am Acad Orthop Surg*. 2000;8:10–20.
- [3] Loder RT, Feinberg JR. Orthopaedic injuries in children with nonaccidental trauma: demographics and incidence from the 2000 kids' inpatient database. *J Pediatr Orthop*. 2007;27:421–26.
- [4] Jayakumar P, Barry M, Ramachandran M. Orthopaedic aspects of paediatric non-accidental injury. *J Bone Joint Surg Br*. 2010;92(2):189–95.
- [5] Gilban HM, Mirdad TM, Jenyo M. Simultaneous post traumatic bilateral cervico-trochanteric femoral neck fractures in a child: a case report. *West African Journal of Medicine*. 2005;24(4):348–49.
- [6] 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):302–08. doi: 10.4055/cios.2011.3.4.302
- [7] Moon ES, Mehlman CT. Risk factors for avascular necrosis after femoral neck fractures in children: 25 Cincinnati cases and meta-analysis of 360 cases. *J Orthop Trauma*. 2006;20(5):323–29.

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