Bilateral femoral fracture in an infant following a road traffic accident

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Abstract
Fractures of the long bones of newborn and infant usually occur particularly in the context of child abuse (or Silverman syndrome) or obstetrical traumas. Bilateral femur fracture at this age in the context of road traffic accident is extremely rare. We report a rare bilateral femoral fracture which occurred following a road traffic accident in an infant of 5 months old. In the first instance a unilateral diaphyseal fracture of the left femur was diagnosed and treated by a Spica cast in a peripheral hospital near the site of the accident. It was only after his transfer to a General (Reference) Hospital that the second diaphyseal fracture of the contralateral femur was diagnosed and then treatment was adjusted accordingly.

Keywords: Femur; bilateral fracture, road traffic accident; infant.

1. Introduction
Fracture of the femur in the newborn and infant femoral fracture occurring outside the usual context of obstetric trauma or child abuse is rare. A bilateral femoral fracture in an infant occurring after a road traffic accident is still extremely rare. This case report is the third known case to the best of our knowledge. The favoring factor is probably related in one hand to particular African context where road safety rules are not being followed. On the other hand, the diagnosis of the 2 fractures made in 2 stages (first near the scene of the accident and then in a Referral Hospital), also reflects the difficulties of care in impoverished African environment. The age of the infant, the special family background, could also lead to a discussion on abuse.

2. Case report
This was the child M.P., a boy of 5 months old who was involved in a road traffic accident with the mother on the highway.

In the history of this child, it was noted that he was born at term with a birth weight of 2.900 kg, without any abnormal features. He is the 3rd child in a family of three children whose first two aged respectively 17 and 15 years were born out of wedlock during the time the mother was following up with her education and was single. Neither the baby nor the mother had their seat belts on. The vehicle was said to have somersaulted before coming to a halt. The child slipped off from her mother’s arms during these movements and was projected onto the floor of the vehicle from where he was rescued.

The first care of this child was given in a health facility near the site of the accident. The clinical examination and radiological investigation of the thigh and hip revealed a mid-shaft transverse fracture of the left femur (Figure 1). An initial left Spica cast was applied in this hospital. The mother on the other hand presented a mid-diaphyseal comminuted fracture of the right humerus associated with a mid-diaphyseal fracture of ipsilateral radius and ulna giving a clinical feature of a “floating elbow”. The mother and the child were subsequently transferred to General (Reference) Hospital.

Upon arrival at the Reference Hospital, the second day following the accident, clinical examination revealed a functional impairment of the right lower limb, a hockey stick deformity of the thigh associated with pain on movement. Additional radiographs requested showed a displaced transverse mid-diaphyseal fracture of the right femur (Figure 2). We then removed the first left Spica cast and replaced it with a bilateral Spica cast. Radiologic control at Day 21 (Figure 3) showed an early consolidation with callus formation on both sides. At
Day 45 we completely removed the Spica cast and the radiologic examination showed a good fusiform callus (Figure 4).

Fig 1: 1st diagnosed diaphyseal fracture of the femur occurred in a road traffic accident.

Fig 2: M.P, 5 months: 2nd diagnosed diaphyseal fracture on the 2nd day after road traffic accident at arrival at the Reference Hospital.

Fig 3: M.P, 6 months: Control radiograph with the Spica cast at Day 21: we noticed a beginning of formation of the callus.

Fig 4: Last control radiograph at Day 45 after removal of the bilateral Spica cast.

3. Discussion
Fractures of the femur in infants are usually reported in the context of child abuse, obstetric injuries or in cases of epilepsy. Bilateral diaphyseal fracture of the femur resulting from a road traffic accident in a baby without other associated lesions is an extremely rare clinical entity. The case report of the infant 5 months occurred in an African context characterized by bad state of the roads, the non-application of safety rules and regulations which is obligatory elsewhere (wearing of seat belt, alcohol test), disorganized emergency services or transportation of the injured. Very often the injured are transported to the nearest hospital and not necessarily that which can provide the most appropriate care in terms of equipment and hospital staff. And also a thorough clinical examination and a comparative plain X-ray radiography of the limbs (mandatory in growing children) would have diagnosed the bilateral fracture earlier and hence immobilization of the lower limbs by a bilateral Spica cast. This was done only when the child was admitted at the Reference Hospital.

Should we remove all tort origin of this rare bilateral fracture of the femur in a child of this age? The spectacular and unique nature of the circumstances of the accident, in a child who was found himself thrown away on the floor of a vehicle that rolled over and got away without head injury or loss of consciousness, this can raise doubts.

Only 2 cases of bilateral femoral fracture in a similar context have been cited in the literature, to the best of our knowledge, reported by Conners and Ochsenschlager [1] then by Smith [2] in children of 9 months and 4 years. These authors implicated the inadequacy of the safety belt for their age. Beals [3], in a study of 80 cases of femoral fractures in children aged 5 years, reported that 30% are attributed to child abuse and only 8.5% are due to violent trauma. He gave a sort of sketch of the child victim of abuse that is a child less than a year old with a history of brain injury and bilateral fractures. All these correspond well to our case except the history of cerebral trauma that has not been highlighted. Ours was 5 months old and presented with a bilateral traumatic injury. It is increasingly recognized that child abuse is a global phenomenon. For Belsey [4], it is estimated from 13 to 20 cases per 100,000 live births in countries with reliable data. Very little is known about the importance of this phenomenon in Africa. Recent studies conducted in Nigeria by Bode [5] then by Osifo [6] showed that the phenomenon is particularly linked to poverty, ignorance leading to abandonment, neglect, and physical mutilations of children primarily affected by birth defects.

Other unusual femoral fractures in children are reported associated with birth trauma particularly during cesarean section for breech presentation, (Cebesoy [7], Vasa and Kim [8], Matsubara et al [9], Mc Collough and Mc Carthy [10], also reported a rare case of bilateral fracture-separation of the distal femoral epiphysis following a home delivery. Paris et al [11] also reported a rare case of proximal epiphyseal fracture-separation of femur which occurred following hypertonic epileptic seizures. They attributed the occurrence of this phenomenon to bone fragility caused by drugs treatment. Finally, periarticular fractures of iatrogenic origin were reported by Simonian [12] as a result of overzealous rehabilitation of joint stiffness of a child.

4. Conclusion
The case we reported has showed us that it is imperative to do the broadest possible clinical assessment of damage in an injured child who does not speak and complimented by systematic comparative radiographs. This should be done despite the nature of poverty in the African environment so as not to miss a serious bone injury. The literature suggests that in any bilateral lesion of the femur in a child of less than a year, we must first think of eliminating child abuse which is peculiar in the African family and cultural settings.
5. Reference