CASE REPORT

Battered baby syndrome with severe malrotation deformities of all long bones of lower extremities: A case report

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Introduction

The term ‘battered baby syndrome’ is defined a clinical condition, usually in children under 3 years of age, who have suffered non-accidental injury, on one or more occasions, by an adult in a position of trust, generally a parent, guardian or a foster parent. The injuries may be minimal or severe, sometimes even fatal and there may be associated deprivation of care and nutrition. It is very common to find a discrepancy between the history and the clinical findings. The neglect and lack of care in these children may result in complications and deformities. We treated a child who was presented with extensive deformities of both lower limbs. The inconsistent history and lack of initial treatment strongly suggested physical abuse. The presence of malunited fractures in all long bones of both lower extremities with excessive callus formation was diagnostic. It was a challenge to treat such severe rotational deformities with corrective osteotomies in a single stage procedure. Though battered baby syndrome and skeletal injuries are common, this was a unique case in terms of the severity of the deformities and the demanding surgical procedure. There is little in the literature concerning the acute correction of rotational deformities of multiple long bones with more than 180° of derotation in single stage procedure.

Case report

A 40-month-old child, first product of a non-consanguineous marriage, was brought for the first time to the out patient department by his mother. The birth history consisted of a full term normal delivery, with normal developmental milestones. The child had bilateral lower limb deformities and had been unable to walk for 6 months. The mother gave a vague history of some trauma to both the lower limbs around 4–6 months previously, for which no treatment had been given. She gave no history of any other trauma but she mentioned that the child sustained burns about eight months previously, again in circumstances which were unclear. The
child had a younger sibling who was 6 months old. A history of unwanted pregnancy was elicited from the mother, which had forced the parents to marry. On general examination, the child was of average build and nutrition, with no obvious systemic abnormality. He had normal intellect and milestones. Upper limb examination revealed no deformity or signs suggestive of previous trauma. Both buttocks showed scar marks with skin hyper-pigmentation resulting from burns.

The right lower limb (Fig. 1a and b) showed an external rotational deformity of the femur, with the patella facing antero-laterally at about 15°. The foot was 90° internally rotated, the tibia showed an anterior angulation of 20° at the distal third and the femur showed a varus deformity of 10° at the distal third. There was no tenderness and no demonstrable abnormal mobility. Localised thickening of bone was present at the lower third of the thigh and the leg, without any skin adherence. The segmental lengths of the femur and tibia were 27 and 22 cm, respectively.

The left lower limb (Fig. 1a and b) showed a true shortening of one cm compared to the right side. The patella was facing laterally with an external rotation deformity of 90°. The foot was rotated a further 90° externally with respect to the knee, i.e. 180° with respect to the iliac crest and thus facing posteriorly. There was no angular deformity in either the femur or tibia. There was a localised thickening of the bone in the middle third of the thigh and the leg, without any skin adherence. The segmental lengths of the femur and tibia were 28 and 22 cm, respectively.

There were scars present on both lower limbs, but no contractures. The hips, knees and ankles had a full range of motion, without any associated pain. There was no vascular or neurological deficit in either lower limb. Spine, skull and rib examination revealed no abnormalities.

The X-ray examination of right femur and tibia (Fig. 2) showed a malunited oblique fracture at the junction of the middle and lower thirds of the right femur, showing abundant callus formation, with a varus angulation of 10°. An overriding of 0.5 cm was also seen at the fracture site. X-ray of the left femur showed a malunited fracture in the middle third, with the distal fragment rotated externally by 90°, such that the knee appeared as a lateral view in the antero-posterior X-ray. An overriding of 1.5 cm was also seen at the fracture site. The X-ray of the right tibia and fibula showed a malunited fracture in the distal tibia with a 20° anterior angulation of the distal fragment and a severe rotational malalignment. There was a malunited fracture of the shaft of the fibula at a higher level (Fig. 3).

The X-ray of the left tibia and fibula showed a malunited distal fracture, with a 90° external rotation malalignment of the distal fragment, i.e. a 180° rotational malalignment with respect to the prox-
Battered baby syndrome with severe malrotation deformities

**Figure 2** Pre-operative X-rays of the patient (antero-posterior views of bilateral femur and tibia–fibula) malunited fractures of shafts of long bones of both lower limbs, with abundant callus formation.

**Figure 3** (a) Post-operative clinical photograph of the patient as seen from front showing complete correction of the left-sided deformities and right-sided leg deformities. A residual external rotation deformity of the right-sided femur can be appreciated which is within acceptable limit. (b) Post-operative clinical photograph of the patient as seen from behind showing correction of deformities and persistent scar marks of burns on the buttocks and thighs.
imal femur. A malunited fracture of the shaft of the fibula at was also seen at the same level.

The procedures performed were a combination of bilateral single stage derotation osteotomies of the both tibias and the left femur. The patient was positioned supine. The approach included a lateral incision for the left femur and medial and lateral incisions at different levels for both sided tibias. The osteotomies were then performed to achieve the desired alignment. The left femoral osteotomy was made at the level of the malunited fracture. No corrective osteotomy was performed on the right femur. The tibial osteotomies were performed at different levels on the two sides. The alignment was checked under an image intensifier. The wounds were closed over a suction drain. Post-operatively the patient was immobilised in a hip spica for 10 days. No internal fixation was used, so as to permit further correction of any residual deformities.

The patient was seen again after 10 days for suture removal and the spica was replaced by bilateral toe to groin casts. These were continued for 6 weeks, after which the casts were removed and check X-rays were taken.

The post-operative follow up X-ray (Fig. 4) of the patient showed that the left femur showed complete correction of the rotational deformity and overriding, union of the osteotomy with abundant callus formation, and a restoration of the knee alignment. The right tibia and fibula showed correction of the deformity, with the distal fragment in normal alignment, with both the anterior angulation and the rotational malalignment corrected. The deformity of the left tibia and fibula was completely corrected, with the distal fragment in normal alignment and the 90° external rotation of distal fragment completely corrected. As no correction was attempted at the site of malunion of the right femur, the post-operative X-rays showed persistent deformity with abundant callus formation at the fracture site and a varus angulation of 10° and external rotation of the distal fragment. A persistent overriding of 0.5 cm was also seen.

References