

Bilateral proximal tibia fracture

M. J. G. Andriessen · E. C. J. L. Mattens ·
C. Sleeboom · H. A. Heij

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Abstract A bilateral fracture of the proximal tibia is rare in children. We describe a girl with a bilateral fracture just distal of the epiphyseal plate after minimal trauma.

Keywords Proximal tibia fracture · Bilateral · Children

Case report

A 14-year-old girl was presented to the emergency department because of the suspicion of bilateral tibia fracture. During gymnastics at school, she injured herself while attempting to jump on a mini trampoline. She fell and was unable to stand up by herself. She was a healthy adolescent girl, without past history. She took no medications. Body mass index was 21. Her menarche was over 1 year ago.

M. J. G. Andriessen · E. C. J. L. Mattens · C. Sleeboom ·
H. A. Heij

Department of Paediatric Surgery,
Paediatric Surgical Center Amsterdam,
Vrije Universiteit Medical Centre,
Postbus 7057, 1007 MB Amsterdam, The Netherlands

C. Sleeboom
e-mail: c.sleeboom@vumc.nl

H. A. Heij
e-mail: ha.heij@vumc.nl

Present Address:

M. J. G. Andriessen (✉)
Surgical Department, Westfriesgasthuis, Hoorn, The Netherlands
e-mail: m.j.g.andriessen@westfriesgasthuis.nl

Present Address:

E. C. J. L. Mattens
Surgical Department,
Bethesda ziekenhuis Hoozevee, Hoozevee, The Netherlands
e-mail: mattens.e@bethesda.nl

Physical examination showed a painful swelling below both knees. In both legs, neurovascular findings were normal.

X-ray of the knee showed bilateral proximal tibial fracture. The fractures start in an oblique plane through the growth plate of the anterior tibial apophysis and then go horizontally through the proximal tibial metaphysis. It could be classified as an unusual Salter 2 type of fracture (Fig. 1).

We performed a closed reduction under general anaesthesia and applied bilateral above-knee plaster cast for 6 weeks (Fig. 2).

Weight bearing in the casts was allowed after 4 weeks.

Bone density measurement (BDM) 4 weeks after the trauma was normal (+1.7SD). When the cast was removed after 6 weeks, she was allowed to resume her usual activities (Fig. 3).

Unfortunately, 4 weeks after removal of the casts, she had a minor bike accident leading to pain and inability to move her right knee. X-ray showed an apophyseal avulsion fracture (Ogden 3A) (Fig. 4).

Open reduction and internal fixation with two cannulated screws were performed (Fig. 5).

After the operation, a non-weight bearing above-knee circular cast was applied to her right leg for 5 weeks. Seven months after the operation, the screws were removed. She had no complaints and was discharged from further outpatient clinic visits.

Discussion

Fractures of the proximal tibia are uncommon in children, representing less than 1.8% of all fractures of the long bones in childhood and adolescence [3]. They frequently

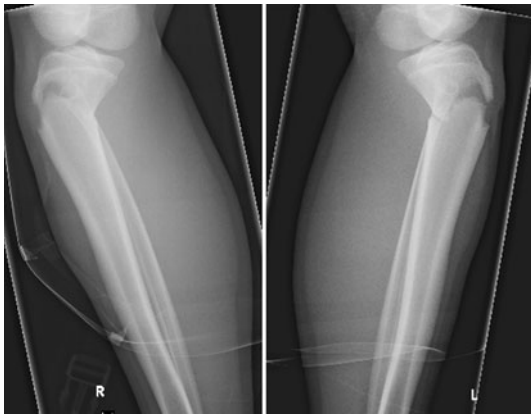


Fig. 1 Trauma; bilateral proximal tibia fracture



Fig. 2 X-ray after closed reduction

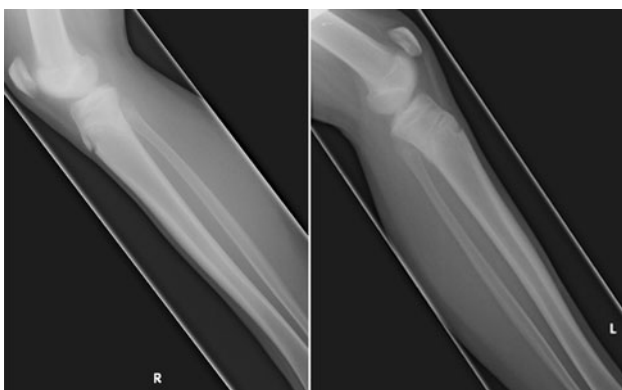


Fig. 3 X-ray after 6 weeks of immobilisation

occur bilaterally after inadequate trauma in obese male adolescents [2, 3]. In adolescence, fracture rate rises significantly both because of increased physical activity as well as changes in bone turnover at the menarche [1].



Fig. 4 (Partial) re-fracture: apophyseal fracture of the right tibia



Fig. 5 After internal fixation

The mechanism of trauma in our patient is a forced quadriceps contraction with the knee in flexion. This trauma mechanism is only described in boys, with a mean age of 15 years [2, 4]. They mostly are obese [2, 3]. The type of fracture that results in literature is a Salter Harris II fracture with a proximal displacement of the anterior epiphysis [4, 5].

However, this case is different. The patient is a 14-year-old girl, with a normal BMI (21), and she had bilateral proximal tibia fractures just distal from the epiphyseal plate instead of epiphyseal fractures, probably because a large part of her epiphyseal plates were closed already. However, the closure of the plate is not totally achieved, since the physis of the anterior apophysis is still open, which explains the type of fracture observed in this case, as well as the subsequent refracture. Closed reduction with above-knee cast for 6 weeks, which we performed, is a good treatment in fractures that are not severely displaced, like in our patient [2–4, 6]. If anatomical reduction is not achieved using closed methods, an open reduction is necessary, followed by internal fixation [3, 4, 6].

Unfortunately, after a new minor trauma, she had a second fracture of her proximal tibia on the right site. This was not really a re-fracture, but an apophyseal avulsion fracture. This may suggest that only the dorsal part of the fracture was healed properly and might be that strong that only on the ventral site an apophysial avulsion fracture occurred.

Conclusion

Bilateral fractures of the proximal tibia are very rare, especially in girls. Closed reduction is a good treatment, but (partial) re-fracture may occur.

Conflict of interest We declare there is no conflict of interests.

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