Trauma Case Reports 41 (2022) 100692

Contents lists available at ScienceDirect

Trauma Case Reports

journal homepage: www.elsevier.com/locate/tcr

Case Report

A rare case of an open transverse patella fracture in a 5-year-old child

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ARTICLE INFO

Keywords:
Patella fracture
Paediatric
Transverse
Open

ABSTRACT

Patella fractures in children are rare accounting for 1 % of all paediatric fractures. Rarer still are transverse patella fractures in children with only 1 case previously described in the literature of a child less than the age of 6. We present the second case in the literature of a transverse patella fracture in a child, and the only case of a transverse fracture in a partially ossified patella in a 5-year-old. Our patient suffered an open patella fracture following fall with a flexed knee onto a broken tile. The case was successfully managed with adult fixation principles of patella fractures with a tension band wire construct. The patient had regular follow-up with knee radiographs showing a well healed fracture and a good range of motion of the knee at 3 months. The hardware was subsequently removed with no complications. In conclusion, we present an extremely rare case of an open transverse patella fracture in a child, utilising adult fixation principles of a patella which resulted in a successful outcome for the patient.

Introduction

Patella fractures in children are rare, accounting for approximately 1 % of all paediatric fractures. These are typically seen in children between the ages of 8–12 presenting as a sleeve-type fracture due to an osseous and or cartilaginous avulsion of the patella tendon [1].

It is extremely rare for a child to suffer from a transverse patella fracture, with only 1 case described in the literature of a child less than the age of 6. We present the second case in the literature of a transverse patella fracture in a child, and the only case of a transverse fracture in a partially ossified patella [2].

Case report

A 5-year-old female presented to the emergency department with a knee injury following a slip and fall. She was running on wet tiles where she slipped and landing with her right knee flexed onto the edge of a broken tile.

On examination, there was a transverse laceration over the prepatellar region. The knee was in a flexed position and the patient was

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https://doi.org/10.1016/j.tcr.2022.100692
Accepted 7 August 2022
Available online 8 August 2022
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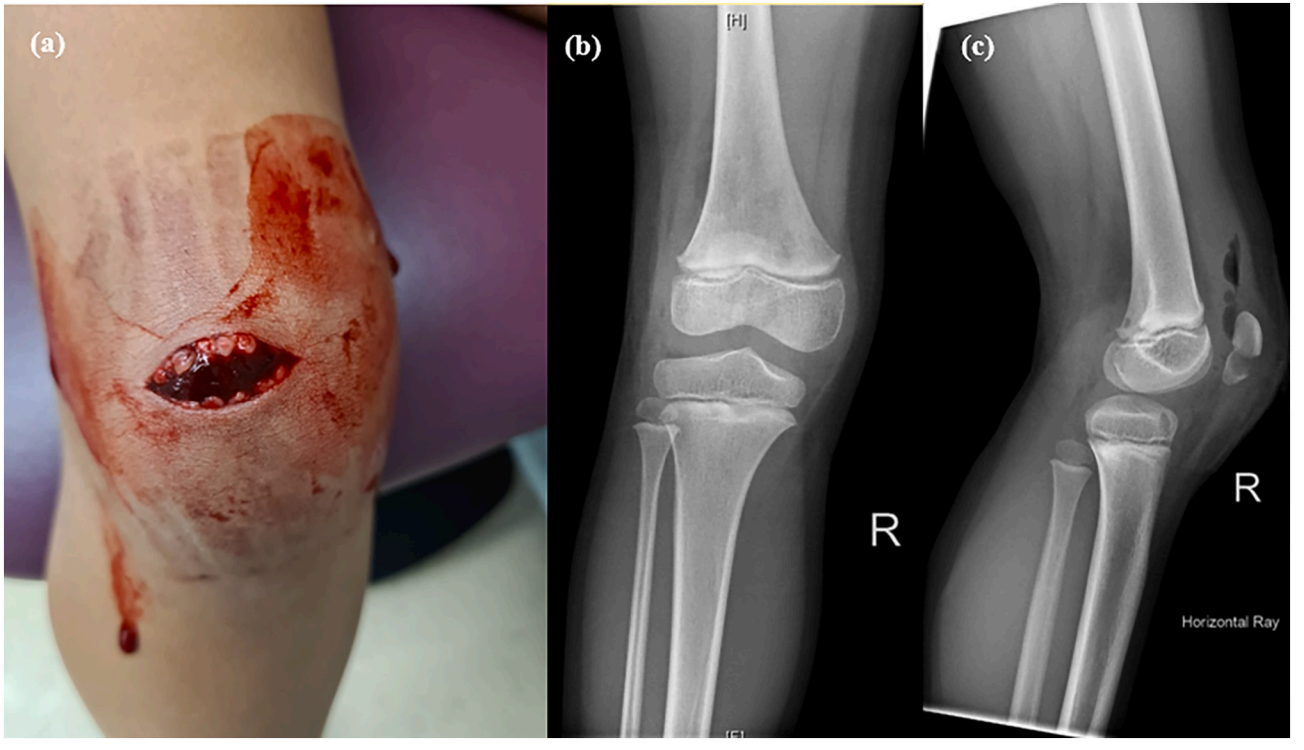

Fig. 1. (a) Clinical photo of knee demonstrating transverse laceration prepatellar region. (b) Anteroposterior and (c) lateral radiographs of the right knee demonstrating an open transverse patella fracture with gas in the knee joint.

unable to perform a straight leg raise. Non weight bearing radiographs of the knee were then performed which demonstrated a transverse patella fracture with gas in the knee joint representing an open fracture which communicated with the external environment (Fig. 1).

The patient was taken to the operating theatre for wound exploration and operative fixation of the patella fracture. The transverse wound was extended proximally and distally in a longitudinal fashion to gain exposure of the patella and to explore the wound. The central ossified portion of the patella as well as the surrounding un-ossified cartilaginous anlage was disrupted. The fracture was distracted to wash the knee joint with normal saline. The fracture edges were then carefully debrided. Reduction of the patella fracture was performed and held with a clamp. We then proceeded to fix the fracture with two 1.6 mm Kirschner (K) wires and a 1.2 mm tension band wire. The tension band wire was placed as close to the surrounding patella cartilage as possible and then tensioned. The wires were cut, bent proximally, and pulled distally for the bent ends to be as close to the cartilage as possible.

Intraoperative imaging was performed to confirm anatomical reduction and correct placement of the tension band wire construct. Although intraoperative imaging appeared to show the tension band and bent K-wires away from the partially ossified patella, this was not the case and appeared as such due to the cartilage being radiolucent (Fig. 2). The wound was then closed with non-absorbable interrupted sutures and dressed. An above knee back-slab was then applied. Post operatively, the patient was allowed to weight bear as tolerated, given a further 24 h of intravenous antibiotics and discharged home the following day.

At the 2-week wound review, the wound had healed with no signs of infection. The plaster was changed to a full cast for a further 2 weeks allowing the patient to weight bear as tolerated. After 4 weeks a gradual knee flexion protocol was implemented. Radiographs at 2 months demonstrated a healed patella fracture with internal fixation in situ (Fig. 3). The patient had a good range of motion at 3 months with the hardware subsequently removed.

Discussion

Patella fractures in children are rare, with only 1 previous description of a patella fracture in a child less than 6 years of age in a non-ossified patella. Our case is the only description of a transverse patella fracture occurring in a partially ossified patella in a child under the age of 6.

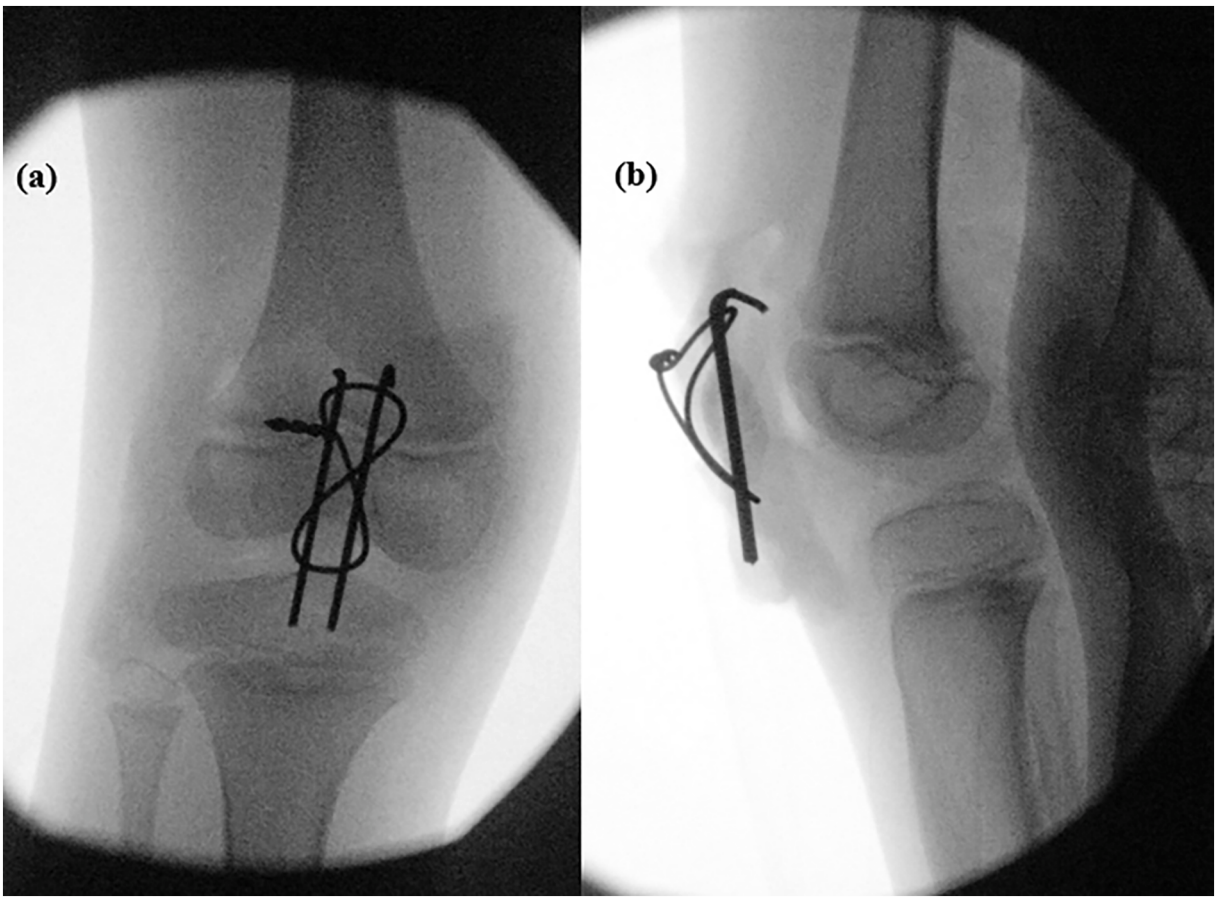

Fig. 2. (a) Intraoperative imaging of anteroposterior and (b) lateral view of the knee demonstrating tension band fixation of the patella fracture.

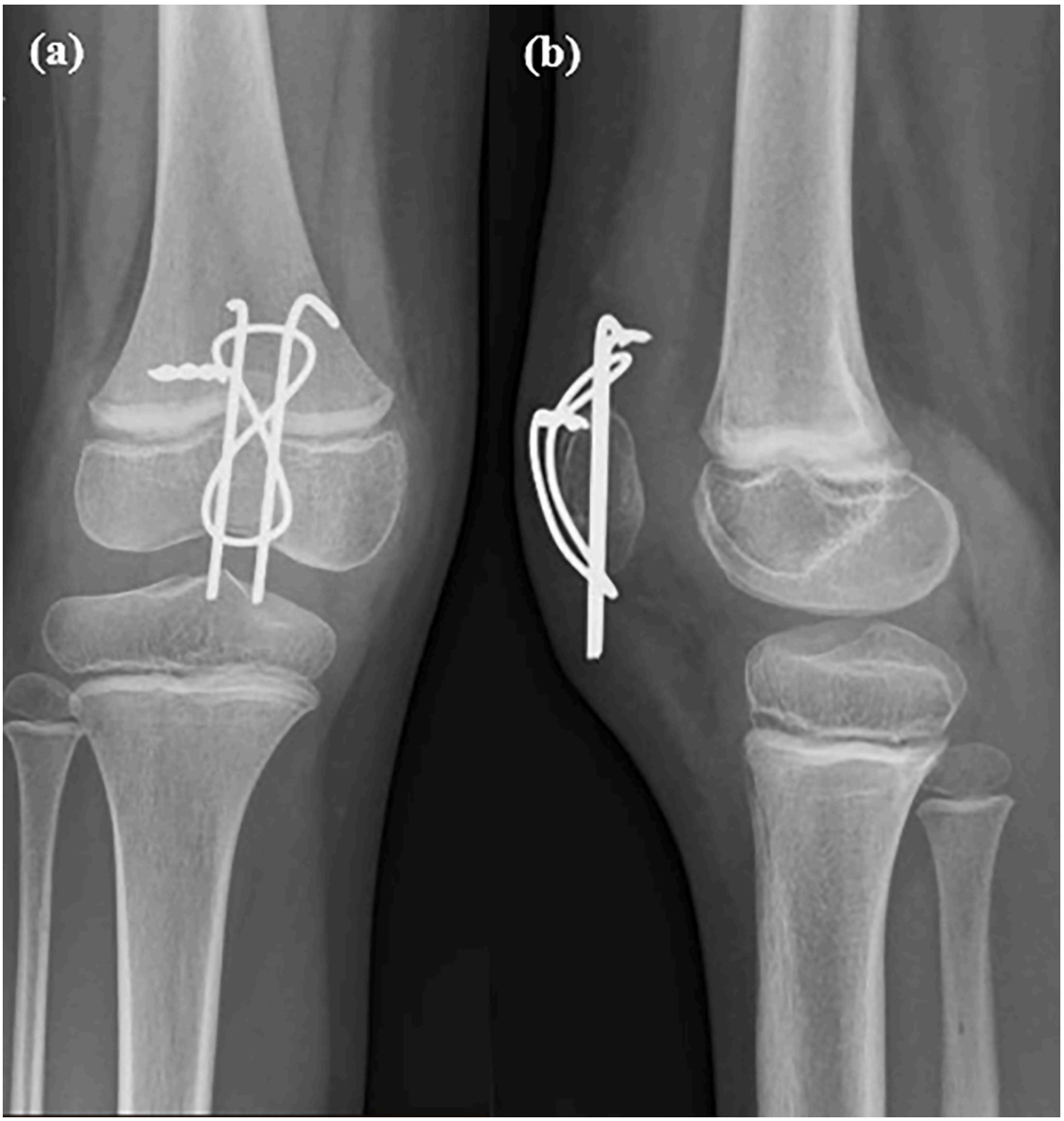

Fig. 3. (a) Anteroposterior and (b) lateral weight bearing knee radiographs 2 months after operation showing a healed patella fracture.

The patella ossifies between 3 and 6 years of age centrally from multiple ossification centres. It then ossifies in a central to peripheral fashion, leaving a peripheral osseo-chondrous rim as it ossifies. This anatomy was evident in our case with central ossification of the patella surrounded by a thick cartilaginous shell [3].

Options for management of patella fractures include fixation with tension band wire construct, circumferential cerclage wires, or osteosynthesis with lag screws. In our case, the patient had enough ossified patella which allowed for passage of K-wires and fixation with a tension band wire. The patient healed well and had a good outcome after surgery with wires removed 3 months post operation [4].

Gowtham et al., described the only case in the literature of an open transverse patella fracture in a 2-year-old with a non-ossified patella. The patient suffered an open patella fracture from a sickle. In this case, the authors used a different fixation technique than our case utilising trans-cartilagenous sutures as the above options described were not viable due to a non-ossified patella [2].

In conclusion, our case report describes an extremely rare presentation of an open transverse patella fracture in a child less than 6 years of age, being the first of its description in a partially ossified patella. This case demonstrates successful use of adult fixation of an extremely rare fracture pattern in a child.

Informed patient consent

The authors declare informed consent was obtained from the patient's next of kin.

Declaration of competing interest

Each author certifies that he or she has no commercial associations that might pose a conflict of interest in connection with the submitted article. Declarations of interest: none.

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