Fracture of the tibial tubercle with a Stener-like lesion of the patellar tendon: a case report

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ABSTRACT

Fractures of the tibial tubercle account for less than 1% of paediatric orthopaedic injuries. We report a case of a 15-year-old boy presenting with a Stener-like lesion of the patellar tendon associated with a fracture of the tibial tubercle. There have been no previously reported cases of this type of injury in the literature. Treatment with open reduction and internal fixation of the fracture along with a repair of the patellar tendon can result in an excellent functional outcome.

KEYWORDS

Patellar tendon – Fracture Knee

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Introduction

Fractures of the tibial tubercle are rare and are generally seen in the paediatric population as they near skeletal maturity. The ossification centre of the proximal tibial physis closes from posterior to anterior and from proximal to distal. This leaves the physis of the tibial tubercle at greater risk of injury when the proximal tibial physis is only partly closed. This fracture pattern is therefore usually seen in patients between 12–15 years of age and is noted to be more common in males. The described mechanism of injury is one of eccentric quadriceps contraction with the knee in flexion. This results in a large force from the extensor mechanism being applied to the tibial tubercle with the potential for an avulsion-type fracture.¹

In 1962, Bertil Stener first described an injury to the ulna collateral ligament of the thumb where the ligament was found to have ‘folded over to point proximally’. The interposition of this ruptured ligament prevented a closed reduction of the fracture. He reported the need for an open reduction technique to remove the interposed ruptured ligament, repair it to the anatomical position and stabilise the associated avulsion fracture.²

Our case report describes a fracture of the tibial tubercle where the patellar tendon was found to be avulsed and folded in on itself (Fig 1). The interposition of the patellar tendon within the fracture site would have prevented a closed reduction with percutaneous fixation of the fracture and resulted in a non-functioning extensor mechanism. We discuss how this injury was managed surgically with open reduction, stabilisation of the fracture and repair of the ruptured patellar tendon.

Case history

A 15-year-old boy presented with an injury to his left knee that was sustained during a football tackle. He had no

Figure 1 Illustration of Stener-like lesion of the patellar tendon.

Figure 2 Preoperative x-ray, lateral view.

Figure 3 Preoperative computed tomography.

medical comorbidities and had no previous history of trauma to this lower limb. Clinical examination revealed a large knee joint effusion, prominence of the tibial tubercle and an inability to straight leg raise.

Initial radiographs taken in the accident and emergency department demonstrated a fracture of the tibial tubercle (Fig 2). The fracture pattern and displacement was further evaluated with computed tomography (Fig 3). Application of the Ogden classification grades this fracture as a type IIa injury based on the radiology.

At the time of surgery, an anterior midline incision was made centred over the tibial tubercle. After superficial dissection we discovered that the patellar tendon had inverted and was tucked inside the fracture site (Figs 4 and 5). Once the distal end of the patellar tendon had been extracted from the fracture site the fracture was anatomically reduced and secured with K-wires. Fracture fixation

Figure 4 Intraoperative photograph of patellar tendon inverted into fracture site.

Figure 5 Intraoperative photograph of patellar tendon removed from fracture site.

Figure 6 Postoperative x-ray anteroposterior view.

Figure 7 Postoperative x-ray, lateral view.

was achieved with 4-mm cannulated screws. A single bone anchor was then used to reattach the patellar tendon to the proximal tibia.

Postoperatively, the patient was immobilised in a splint with the leg in extension for two weeks and was advised to partial weight bear. The allowed range of movement of the knee was then gradually increased in the six weeks following surgery. Clinical review at six weeks revealed an intact

extensor mechanism with active straight leg raise and knee range of movement from 0–90 degrees of flexion. Radiologically, the fracture remained anatomically reduced (Figs 6 and 7).

Discussion

The management of displaced tibial tubercle fractures is usually surgical. The principles of treatment include anatomical reduction of the fracture and restoration of the extensor mechanism. However, some literature suggests that a closed reduction with percutaneous fixation or casting of these Ogden type II fractures is an appropriate management strategy.^{3,4} In our experience of managing these injuries, the soft-tissue stripping and patellar tendon disruption is often not appreciated when reviewing the radiographs in isolation. In our case report, we have identified a situation where a tibial tubercle fracture was associated with a Stener-like lesion involving the patellar tendon (Fig 1). Open exploration of this injury was imperative to extract the interposed patellar tendon from the fracture site and achieve adequate fracture reduction and fixation. It also allowed for reattachment of the patellar tendon to its distal insertion with the use of a suture bone anchor.

Although this is the only reported case of a Stener-like lesion of the patellar tendon associated with a tibial tubercle fracture, it highlights the need for an open exploration of any displaced tibial tubercle fracture. Gaining anatomical reduction of the fracture is less likely to result in growth arrest from this secondary ossification centre, which may lead to genu recurvatum. It also allows for a stable reconstruction on the extensor mechanism and repair of any associated soft-tissue damage resulting from this type of injury.

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