

TIBIAL TUBEROSITY AVULSION ASSOCIATED WITH PATELLAR TENDON AVULSION

D. GOODIER¹, N. MAFFULLI², C. J. GOOD¹

We report an adolescent boy with avulsion of the tibial tuberosity associated with avulsion of the patellar tendon. He underwent open reduction and internal fixation of his bone injury, and the patellar tendon was successfully reattached. The boy experienced a full recovery.

Keywords : knee injury ; sports injury ; epiphyseal lesion ; open reduction ; internal fixation.

Mots-clés : genou ; traumatisme de sport ; lésion épiphysaire ; réduction à ciel ouvert ; ostéosynthèse.

INTRODUCTION

Avulsion of the tibial tuberosity in adolescent sportsmen is uncommon (1, 6). Associated avulsion of the patellar tendon is a rare concomitant finding (5). We report a patient with such an injury. He was treated operatively and experienced a full recovery.

CASE REPORT

An eighteen year old boy of normal build and with no prior history of knee problems, including Osgood-Schlatter's lesion, experienced sudden pain in his left knee when he tripped trying to kick a football. The knee swelled immediately, and the patient was unable to straighten it or to bear weight on it.

He was brought to the Accident and Emergency Department, where, on examination, he was found to have a tense haemarthrosis. A defect was palpable at the site of his tibial tuberosity and there was a high riding patella. No active knee extension was possible. The contralateral knee was normal

with no evidence of Osgood-Schlatter's lesion or patella alta.

Radiographs of the knee (fig. 1) showed an Ogden type 2A avulsion fracture of the tibial tuberosity. A treatment plan consisting of surgical exploration with a view to open reduction and internal fixation was proposed and accepted by the patient. The operation was performed ten hours from the injury.

The tibial tuberosity was exposed through a longitudinal incision about 8 cm long. The tuberosity fragment had maintained an attachment to the anterior tibial plateau superiorly, the periosteum of its anterior surface was completely stripped off. The patellar tendon was attached to the periosteum and therefore detached from the tibial tuberosity.

The fracture was reduced and the tendon reduced over the anterior surface, then fixed using a 6.5 mm AO partially threaded cancellous screw with a washer (fig. 2). The tendon was sutured to the surrounding fascia and periosteum using heavy vicryl sutures. The wound was closed over a suction drain, the leg immobilised in an above knee plaster-of-Paris backslab.

A full cylinder cast was applied on the third post-operative day and the patient mobilised. When fully weight bearing on his injured leg, on the fourth post-operative day, he was discharged

¹ Department of Orthopaedics, Newham General Hospital, Glen Road, Plaistow, London E13 8RU, United Kingdom.

² Department of Orthopaedic Surgery, University of Aberdeen Medical School, Polwarth Building, Foresterhill, Aberdeen AB9 2ZD, Scotland, United Kingdom.

Correspondence and reprints : N. Maffulli.



Fig. 1. — Lateral view at presentation. A type 2A (according to Ogden) avulsion fracture of the tibial tuberosity is present. A high riding patella is evident.



Fig. 2. — Radiograph following open reduction and internal fixation. Anatomical reduction has been achieved. The patella tendon has been re-inserted, and the patella now lies in its anatomical position.

home. The cast was removed at six weeks from the operation and intensive mobilisation started. The patient was able to swim after one week (seven weeks from the injury) and to cycle after three weeks (nine weeks from the injury). He regained full and painless range of motion of the knee by five weeks (eleven weeks from the injury) and started gentle jogging at eight weeks (fourteen weeks from the injury). At eighteen weeks from the injury he was totally asymptomatic, had a residual thigh girth discrepancy (measured 10 cm proximally to the upper patellar margin) of 1.5 cm, and resumed recreational sporting activities.

When last reviewed, fifteen months from the injury, he had returned to competitive school sport and had no functional impairment. There

was still a one cm difference in thigh girth and no difference in leg length.

DISCUSSION

Avulsion of the tibial tuberosity is uncommon (4, 8). More common in adolescents boys, the presence of Osgood Schlatter's lesion seems to be a predisposing factor (3, 4, 6, 8). Several associated injuries have been described, including compartment syndrome (7), meniscal injuries (2) and patellar tendon injuries (1, 5).

The mechanism of injury usually consists of violent knee flexion against a tightly contracted quadriceps, or a violent quadriceps contraction with a fixed foot (4). For the patellar tendon to

be avulsed, as in the case presented, the extensor mechanism of the knee must fail at two sites, i. e. at the epiphysis of the anterior tibial tuberosity and at the insertion of the patellar tendon into the tuberosity.

The synchronous failure at both sites would imply perfectly balanced forces at both. However, it is more likely that the initial injury is the avulsion of the tibial tuberosity produced by the sudden flexion of the knee against the maximally contracted quadriceps complex. When the bony fragment has been inverted, the continuation of the applied force would strip the patellar tendon in a retrograde manner until complete detachment occurs. At this point, there is complete discontinuity of the extensor mechanism of the knee.

This complex injury is rare (5), but its existence implies that avulsion injuries of the tibial tuberosity in which there is incomplete ability to extend the knee should be treated by open exploration and reduction, as closed manipulation (1, 6) may overlook the associated tendon lesion, failing to restore the continuity of the extensor mechanism of the knee.

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SAMENVATTING

D. GOODIER, N. MAFFULLI, C. J. GOOD. Afrukking van de tuberositas tibiae met avulsie van de kniepees.

De auteurs beschrijven een afrukking van de tuberositas tibiae, geassocieerd met een avulsie van de kniepees bij een adolescent. De fractuur werd bloedig gereponeerd en gefixeerd met behulp van osteosynthese; de kniepees werd gehecht. De functionele recuperatie was volledig.

RÉSUMÉ

D. GOODIER, N. MAFFULLI, C. J. GOOD. Arrachement de la tubérosité tibiale associée à une avulsion du tendon rotulien.

Les auteurs présentent un cas d'arrachement de la tubérosité tibiale, associée à une avulsion du tendon rotulien chez un adolescent. L'arrachement tubérositaire fut traité par ostéosynthèse et le tendon rotulien fut réinséré avec succès. La récupération fonctionnelle fut complète.