

TIBIAL TUBEROSITY AVULSION ASSOCIATED WITH PATELLAR TENDON AVULSION

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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 ; injuries ; sports injuries ; epiphyseal lesions ; open reduction ; internal fixation.

Mots-clés : traumatisme ; genou ; sport ; lésion épiphysaire ; réduction sanglante ; 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 18-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 had a tense hemarthrosis. 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 10 hours after 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 and the leg immobilized in an above-knee plaster-of-Paris backslab.

A full cylinder cast was applied on the third postoperative day and the patient was mobilized. When he was able to bear full weight on his injured leg, on the fourth postoperative day, he was

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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 patellar tendon has been reinserted, and the patella now lies in its anatomical position.

discharged home. The cast was removed at 6 weeks from the operation and intensive mobilization started. The patient was able to swim after one week (7 weeks from the injury) and to cycle after 3 weeks (9 weeks from the injury). He regained full and painless range of motion of the knee by 5 weeks (11 weeks from the injury), and started gentle jogging at 8 weeks (14 weeks from the injury). At 18 weeks from the injury he was totally asymptomatic. He had a residual thigh girth discrepancy (measured 10 cm proximally to the upper patellar margin) of 1.5 cm and he was able to resume recreational sporting activities.

When last reviewed, 15 months from the injury, he had returned to competitive school sports and

he had no functional impairment. There was still a one-cm difference in thigh girth but no difference in leg length.

DISCUSSION

Avulsion of the tibial tuberosity is uncommon (4, 8). It is common in adolescent 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 cause the surgeon to overlook the associated tendon lesion and fail 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, geassocieerd aan een 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 met succes 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, associé 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.