



Fracture of the tibial tubercle in athletic adolescent

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ABSTRACT

Avulsion fractures of the tibial tuberosity are uncommon. There occur in well-developed, muscular athletic male individuals nearing skeletal maturity. The authors present a case of an 15-year-old boy who has a type IIB avulsion-fracture of the tibial tubercle. Surgical treatment gives an excellent outcome. We compare it with the literature.

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Keywords

Avulsion-fracture,
Osgood-Shlatter,
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Introduction

The avulsion fracture of the tibial tuberosity (ATT) is rare. The first case was published in 1853 by deMorgan (1). It preferentially found among the boy at the end of growth in a sports activity. The diagnosis is confirmed by a standard radiological assessment. Ogden classification (2) is widely used for adopting a therapeutic strategy based on the stage of the fracture. We relate a case of avulsion fracture of the left TTA in an adolescent of 15 years during a basketball game.

Clinical observation:

It is a 15 year old boy, who as history repeated pain in the TTA and a similar fracture in his brother treated conservatively there 3 years, having presented after a jump during a basketball game a total pain and functional impairment in his left knee.

Physical examination found edema and ecchymosis compared with TTA loss of active extension of the left knee. The neurovascular examination nervous is normal and no evidence for a syndrome boxes. Plain radio graphs showed a fracture avulsion of the tibial tubercle, classified according to stage IIB Ogden classification (2).

The patient underwent open reduction at home by a first middle way. The bone fragment was provided by the two cortical screws without washers. The intraoperative exploration was not objectified associated lesions of the patellar tendon, meniscus and central pivot. After a year of decline the patient has recovered a full knee mobility, sports recovery was permitted at 6 months.

Discussion:

Avulsion fracture of the tibial tubercle is a rare trauma injury. It represents 3% of all proximal tibial fractures (3) and less than 1% of all epiphyseal disorders (4,5). The sporting male teenager is the stomping ground (6). The women's involvement is much rarer (7,8). Bilateral involvement is extremely rare (9).

The most incriminating sports are basketball and high jump (6), this is explained by the frequency hopping and pulse responsible for tensile stress on the patellar tendon TTA taken. Avulsion fracture of the tibial tubercle in our patient occurred during a basketball game which is consistent with literature data. Running, football and gymnastics come in second place. Rare

cases occurring during walking and diving have been reported (10).

Two main mechanisms have been described (6). The first is a sudden contraction of the quadriceps knee extension occurring during jumps in basketball, mechanism responsible for the avulsion fracture of the tibial tubercle in our young athletes. The second is a fast passive knee flexion against a contracted quadriceps common mechanism in the high jump.

The history of our patient suggest to Osgood Schlatter associated. Indeed, this association is common, Ogden and Murphy (2) reported nine cases out of 15, and Peyroux Mathevon (11) found 5 of 5 cases. Authors believe that Osgood Schlatter alter the biomechanical strength of the cartilage TTA (12).

Pain and functional impairment are constants. The presence of a knee hemarthrosis may have two explanations is that it is a type III fracture Ogden responsible for the dissemination of fracture hematoma to the joint through the epiphyseal line (6) or damage to the central or hub associated meniscal (6,10). The knee is flexed from 20 to 30 °, any active extension is impossible. The nervous and vascular examination for signs for a compartment syndrome should be systematic (10). Our patient did not have these complications. The diagnosis is confirmed by radiological assessment standard for classifying the fracture classification according to Ogden (2,12) (Figure 1). In our patient, there is a fracture-type IIB. CT is not necessary for preoperative planning. MRI may be indicated if an ACL injury or meniscus associated (6) is suspected.

Orthopaedic treatment is indicated for fractures IA and type II fractures scarce and III non-displaced (6,10). It consists of a cast immobilization knee extended for a period of six weeks without support. Surgical treatment is indicated in all displaced fractures (6,10). Some authors such Wiss et al (14) recommend a route first para patellar lateral to spare infra patellar nerve fibers of the saphenous nerve whose achievement is a source of neuromas and hypoesthesia infra patellar very inconvenient for the patient. We opted for a middle vertical path, we did not have these complications. The reduction is generally easy rescue after periosteum and bone can be made by screws or pins depending on the size of the fragment and

comminuting. An exploration of the patellar tendon, quadriceps and center pivot should be the rule. Frankel et al (15) reported 2 cases of avulsion fracture of the tibial tubercle associated with patellar tendon avulsion that required tendon suture protected by strapping. The post operative immobilization is 6 weeks. Ergun et al (16) recommend them immediate passive rehabilitation.



Figure 1: Anteroposterior radiograph of the left knee



Figure 2: Lateral radiograph of the same knee showing avulsion of the tibial tubercle



Figure 3: X-ray control after screwing effect profile

Most published series report excellent results with full recovery of knee mobility. Bolesta and Fitch (5) in their series of 16 cases are made after a 15-month decline of 87.5% excellent results. Ogden et al (2) reported 93% of asymptomatic patients after treatment. Chow et al (17) in a series of 16 patients reported following a decline of 3.7 years 100% good results, only one patient required not to take an intense sporting activity. Our patient recovered a normal knee mobility after two months and was able to resume his sporting activity at 6 months.



Figure 4: X-ray control, incidence of side

Conclusion:

Avulsion fracture of the tibial tubercle is rare, affecting mainly young male athlete. The association avulsion of the tibial tubercle and Osgood-Schlatter disease is long known. The diagnosis is easy after a standard radiological assessment and research associated lesions is the rule. Ogden classification is the reference and guide therapeutic strategy. The prognosis is usually excellent.

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