Unusual patellar tendon injury in an adolescent runner with generalised ligamentous laxity

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Abstract
A case is reported of an acute traction injury of the patellar tendon in a boy of 14 with joint hypermobility. Such injuries are unusual but early diagnosis and surgical repair lead to a good long term out-
come. In adolescents participating in sports, the awareness of the possibility of a rare knee extensor mechanism injury is essential for a successful outcome.


Key terms: patellar traction injury; joint hypermobility; adolescence

Acute traction injuries of the patellar tendon occur infrequently during childhood and adolescence. They are usually sustained during sporting activities such as competitive running or the takeoff or landing phase of a jump. Before the fusion of the tibial tuberosity apophysis with the shaft (at 16 to 19 years), the proximal tibial growth plate is the common site of failure of the knee extensor mechanism, resulting in avulsion of the tibial tuberosity. We report a case of an adolescent with a spontaneous complete stripping of the distal end of the patellar tendon from its tuberosity attachment, with no bony avulsion. It is interesting that the characteristics of the hypermobility syndrome (HMS) whose benign nature has been questioned recently, were present in this boy.

Case report
A 14 year old schoolboy runner was running on an even surface, performing short distance pace accelerations. While walking soon after having completed this exercise he felt sudden pain in his left knee, followed by inability to bear any weight on that leg. He presented in casualty with tenderness and moderate swelling over the patellar tendon. He was unable to perform active straight leg raising. An x ray revealed a high riding patella (fig 1), suggesting a complete rupture of the patellar tendon. Surgical exploration was undertaken within 12 hours. The patellar tendon was found completely detached from the tibial tuberosity (fig 2), with no bony fragments avulsed. The tendon was repaired with conventional techniques: two layers of two vicryl sutures to the surrounding periosteum and fascia. Postoperatively a long leg plaster cylinder was applied for six weeks before mobilisation was started. The boy had a full pain-free range of movement and was able to fully weight-bear at the eight week follow up. He was running without problems when reviewed six months later. On clinical examination generalised joint hypermobility was found and a total score of eight in Beighton's nine point scale1 of joint hypermobility criteria was measured.

Discussion
Patellar tendon traction injuries may be classified as either acute or chronic. Acute traction injuries are generally uncommon at any age, occurring most often at the inferior pole of the patella or rarely through the mid-substance of the tendon. Before the age of skeletal maturity, the equivalent injury is avulsion fracture of the unfused tibial tuberosity (proximal tibial apophysis) since the weak site of the extensor mechanism of the developing knee is the growth plate of the proximal tibial apophysis. This bony avulsion commonly presents as a subacute or (more usually) as a chronic condition such as Osgood-Schlatter’s disease. It may be seen as an acute condition following direct trauma or excessive traction force, occasionally with partial avulsion of the patellar tendon as a concurrent injury,2 but this is rare. Complete avulsion of the patellar tendon from its distal insertion without bony detachment has previously been reported only once, in a 14 year old boy competing in the high jump who was also treated successfully with early surgical repair.3

We report here an unusual spontaneous presentation of an acute injury which belongs to a group of injuries usually requiring a significant traction force at the moment of occurrence. In this case there was clearly no vigorous muscle contraction at the moment of tendon rupture. Ruptures of the patellar tendon can occur spontaneously, and occasionally bilaterally, in older patients, usually in association with degenerative bone, tendon (especially following local steroid injections), or connective tissue diseases. However, there was no history of any systemic disease or previous knee problems in this boy.

Another interesting finding was the presence of the hypermobility syndrome (defined as generalised ligamentous laxity in the absence of demonstrable systemic rheumatological disease). This syndrome is seen in a substantial proportion of healthy individuals with no ill effects and frequently considered an advantage in activities such as sports or dancing, where
greater flexibility is an asset. However an increasing number of reports have linked various musculoskeletal problems with this syndrome.4 5 Although any aetiological relation of the acute injury reported here with the hypermobility syndrome is rather speculative, spontaneous ruptures of the Achilles tendon have been associated with the hypermobility syndrome.5

Early diagnosis and surgical repair leads to excellent results in all acute knee extensor mechanism ruptures and the rare type of injury presented here followed this rule. The diagnosis may not be instantly apparent, especially in an unusual presentation with no bony avulsion and without the typical history of sudden pain and loss of function during effort in competitive sporting activities. Indeed, in a series with similar injuries in adults6 the rate of misdiagnosed ruptures at the initial examination was as high as 28%. Therefore, in adolescents participating in sports, the awareness of the possibility of a rare knee extensor mechanism injury is essential for a successful outcome.