



Case Report

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Isolated Vastus Intermedius Rupture in A 28year Old Male: A Case Report and Review of Literature

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Abstract

Introduction: Quadriceps injuries are common. Isolated ruptures of the vastus intermedius are rare. There is a limited number of studies in literature on isolated injuries to the vastus intermedius.

Case Presentation: A case of a healthy 28-year-old patient presenting with reduced mobility and pain following a traumatic injury who sustained an isolated rupture of the vastus intermedius muscle. The rupture of the vastus intermedius tendon was diagnosed on magnetic resonance imaging (MRI). The patient was managed conservatively with a period of rest following by 3 months of Physical therapy and made a complete recovery by 5 months post injury.

Conclusion: Quadricep tendons ruptures generally occur due to degenerative changes and are associated with risk factors. This case is a young 28-year-old patient with a traumatic rupture of their vastus intermedius tendon. This type of injury is rare, however can present with significant symptoms that may result in the development of compartment syndrome that should be closely monitored.

Keywords: Quadriceps; Vastus Intermedius; Trauma; Magnetic Resonance Imaging

Introduction

Isolated vastus intermedius injuries are rare and there are limited studies in the literature. There have only been 5 described cases in the literature, the first in 2007, all males between 22-48 years of age. Of these cases 2 underwent surgery to repair the tendon with 1 re-rupture. The case of re-rupture was a patient with a history of steroid use. The other 3 cases were managed conservatively, and all reported good outcomes with regards to range of motion, gait, and function [1,2,9].

Quadriceps tendon injuries generally occur following the 4th decade [5,6] and usually involve the rectus femoris muscle [3]. The vastus intermedius is a component of the quadriceps muscle group and is a part of the extensor apparatus of the knee to help function the power of knee extension. The aim of this case study is to present a case report of a 28-year-old patient presenting with an isolated

Vastus Intermedius rupture following a rugby league injury. The injury is discussed with relevant anatomy and biomechanics associated.

Case Presentation

Patient Information: A 28-year-old, healthy patient presented to the Emergency Department with a history of left anterior thigh pain with reduced weight bearing after a rugby game. The patient sustained a direct blow from an opponents' knee to their anterior thigh. The patient had no previous history of left lower limb trauma, no past medical history and was on no medications including steroids or fluoroquinolones.

Clinical Findings: On physical examination there was no joint effusion to the hip or knee and no ligamentous injury to the knee.

The anterior thigh was swollen and tender (Figure 1). There was no obvious palpable deficit in the muscle. Their knee range of motion (ROM) was 0 to 30 degrees of flexion.

Diagnostic Assessment: X-ray at time of injury shows a large knee effusion but no fracture. They were treated with analgesia,

given crutches and assessed by a Physiotherapist. A follow up MRI ordered at 2 weeks post injury confirmed a 16cm x 8cm x 7xm haematoma with rupture of the distal insertion of Vastus Intermedius (Figure 2) with no fracture or ligamentous injury sustained.



Figure 1: Photograph of patients injured extremity.

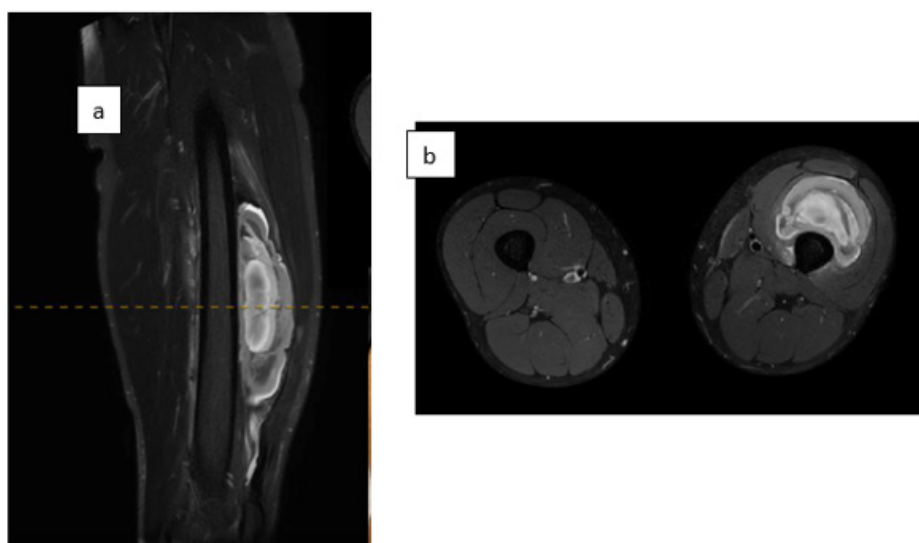


Figure 2: T2 sequence reveals rupture of the tendon on sagittal (a), axial (b) views.

Therapeutic Intervention: The patient seen by a doctor and a physiotherapist in the emergency department at time of presentation and given instructions to rest, ice, elevate the leg. They were given crutches and advised to weight bear as tolerated with crutches and wean off the crutches over the following two weeks. They were informed to monitor signs and symptoms for compartment syndrome. The patient attended an outpatient Physiotherapy clinic and commenced quadriceps activation exercises from week 3 which then progressed to a graduated return

to run/sport program. This included soft tissue massage, active and passive quadriceps and hip flexor stretching. Over the following 2 months the patient started to perform strength exercises including lunges, single and double leg squats. The patient also progressed to running at 6 weeks post injury. The patient was able to return to rugby 3 months following injury. The patient was finally discharged following their 5-month review with no residual symptoms and had returned to full function.

Discussion

The vastus intermedius is a component of the quadriceps muscle along with the rectus femoris, vastus lateralis and vastus medius within the anterior compartment of the thigh [7]. The muscle has only recently been reported as a component of the lateral part of the extensor apparatus of the knee [4,6]. Injuries to the rectus femoris are the most common [3]. Rupture of the quadriceps is more common after the 4th decade and in the presence of risk factors such as steroid use and degenerative changes [10]. Younger patients usually present following trauma. The most common mechanism of injury being eccentric overloading of the extensor mechanism with the knee in a flexed position [2].

The vastus intermedius forms the deepest layer of the patella tendon which is arranged in a tri-laminar fashion with the quadriceps femoris being the most superficial and the vastus lateralis and medius forming the intermediate layer [1]. The vastus intermedius muscle nerve supply comes from the posterior divisions of the femoral nerve with its arterial supply through individual branches of the transverse branches of the lateral femoral circumflex artery [7]. The muscle origin is from the proximal two thirds of the anterolateral surface of the greater trochanter and its distal portion converges towards the patella where it forms part of the patella tendon [1]. Its function is both to power knee extension along with prevent knee flexion, similar to that of the other components of the extensor apparatus [4]. Whilst it has been hypothesized that it is significant in terms of stabilizing motion of the patella by counteracting the forces of the medial components of the quadriceps group [4,7,11].

MRI imaging is the most sensitive and therefore the technique of choice for evaluating acute tendon injuries [3]. There are few high-quality studies that examine the Vastus Intermedius muscle anatomy and characteristics [6], and therefore further research is needed to establish its clinical relevance and choice of treatment. In conclusion, this case of an isolated rupture of the vastus intermedius tendon was treated conservatively and with appropriate Physiotherapy and made a full recovery. The patient was regularly followed up, which allowed for clear documentation of the recovery. The lesson from this is that all cases in the literature to date which have been managed conservatively have all had good

outcomes and therefore is the recommended method of treatment for this injury.

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Conflict of Interest

No Conflict of Interest.

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