

## In which Cases it is Proper to Perform MRI to Diagnose Rupture - Tear of Rectus Femoris or Vastus Intermedius? An Objective from the Point of View of Muscle - Injuries in Sports

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### Abstract

Muscle injuries are the most common injuries in sports (it varies from 10 to 45% depending on sport activity and quality - amateur or professional sport) [1,2]. The formation of fibrotic tissue <scar> will compromise the muscle function [3]. Despite conservative treatment presents adequate functional results in the majority of athletes who have muscle injury (especially in partial tears) the consequences of treatment failure can compromise the return to sport (especially competitive) [1].

The biarticular muscles, such as quadriceps femoris and especially femoris rectus or vastus intermedius, present higher risk of ruptures - tears due to excentric contraction. The prevalent type of injuries are stretching injuries [1,2,4,5]. The rupture occurs in ball kicking (soccer - football), jump (soccer, volleyball, basketball, handball), acceleration phase of running (athletics, football, basketball, handball) or in contraction against resistance. Although conservative treatment leads to good results, but inadequate to achieve same sport results as previous, due to lower muscle strength, surgical treatment with postoperative rehabilitation program shows better outcomes (especially for athletes of competitive sports versus amateur athletes) [6].

**Keywords:** MRI; Rectus Femoris; Vastus Intermedius

### Introduction

Muscle injuries are the most common injuries in sports (it varies from 10 to 45% depending on sport activity and quality - amateur or professional sport) [1,2].

### Case Report

Patient is an 18 year old male amateur soccer player. Last 8 years he is training with academy and this is his first year as senior player. He used to practice 3 times per week (90 minutes) and plays one time a week. He passed his medical - cardiological and ergometrical tests. He did not mentioned any other illnesses and he was negative to infection by Covid-19 (he is fully vaccinated). He does not smoke or consume any alcohol. He does not use any anabolic medicaments or food supplements. He presented to our office complaining for decreased - lower muscle strength of his left foot

(he use usually the right foot) which had an accumulating course in duration of last week (after one week). He could not remember any direct hit, occurring of symptomatology after ball kicking or acceleration of running or any predisposing activity. He complained for mild pain. He referred previous conservative treatment with CEBI protocol (cold therapy, elevation, bandaging and immobilization) as suggested by medical doctor who attended trainings and games. Clinical examination revealed sensitivity during palpation, almost normal range of motion, decreased muscle strength of affected foot, without palpable gap or knee extension gap.

He was examined by x-ray (without bone lesions), ultrasound (possible rupture of rectus femoris, in need of MRI evaluation) and eventually MRI to confirm the presence of lesion of rectus femoris and to classify it stage. Muscle injuries are classified by O Donoghue [7] in 3 grades according to size and functional loss:

- Grade I: Irrelevant tissue lesions.
- Grade II: Tissue lesions associated with strength reduction.
- Grade III: Complete rupture of the muscle -tendon complex and complete functional loss.

The lesion of our athlete was classified as grade II. He developed small contusion. It was suggested to him to be treated surgically for better outcome and he gave his consent. In few days he will be operated. Also, it was explained to him that he will follow immobilization for three weeks and physiotherapy - rehabilitation program.

### Discussion

First of all in this case we showed the need of MRI and its prevalence versus ultrasound as it gives us the ability to classify the grade of muscle injury and accordingly the strategy of treatment in cases that clinical picture is mild.

Second. If there is a need for quick return to sports as in young adults where the muscle strength is important not only for sport, but also for quality of life the surgical treatment has better outcomes versus conservative treatment (but there is need to report more cases and to plan and organize studies to have evidences for the abovementioned statement).

### Conclusion

In young adult sportsmen (professional, amateur) with mild symptomatology of rupture-strain of rectus femoris or other muscles of quadriceps group the clinical examination must be supported except usual x-ray (for logical exclusion of bone pathology) and ultrasound (non-radioactive, safe, but low contrast ability especially to classify the grade of muscle injury) also with an MRI after acute phase (usually until one week) for better approach and ability to classify the grade of rupture to plan strategies of treatment with preference for surgical intervention in muscle injuries above grade II. There is need to report more cases and to plan and organize studies to have evidences for the abovementioned statement.

### Conflicts of Interest

The authors declare no conflicts of interest.

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