

## Acute Pain Problem: Muscle-Tendon Injuries in Athletics

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### Abstract

Athletics, as the queen of sports, is very demanding in physical sense. Due to numerous explosive, fast and strong movements in short time intervals, acute injuries often occur in various muscle groups. All of those injuries can leave permanent unwanted consequences on athlete's career, if they don't react adequately. In order to avoid that, it is important to react as soon as the first symptoms of a possible injury appear. It is necessary to determine and record exact anamnesis of the problem, determine diagnosis and treatment method, as well as including of controlled exercises which can contribute to a faster recovery, so that an athlete can bring their body to a good form and continue with trainings and competitions. The problem of acute pain in loin and upper leg area in athletes is represented in this short study.

**Keywords:** *Athletics; Injuries; Professional Sport; Skeletal Musculature*

### Introduction

Athletics includes the biggest number of various disciplines of cyclic acyclic character which are manifested from moderate to maximum intensity (running, jumps, throws). Therefore, player injuries are very different and in some occasions they can be fatal and can permanently disable the player for further training and continuing their career. In some athletic disciplines, injury risk is especially worrying (racers from 60 - 400m, long jumpers, high jumpers, triple jumpers, long-distance runners), they need significant help of medical staff. Injuries of lower caudal extremities occur often even in throwing disciplines (shot put, discus throw, javelin throw, hammer throw) in which, by logic, hands are more subjective to injuries. Having that in mind, sports doctors very often have a chance to see a wide spectre of athletes' problems, and most often those are bone breakage caused by elbow in throwing in shot put, javelin throw, Achilles tendon injury during running, low start, take-off, etc. Injuries and diseases represent big problem for athletes (at least the successful ones), since their personal income depends on their health status and results. It is natural that every athlete has a dream of winning gold medal on Olympic Games and reaching World record and therefore, they often push themselves to the limits in a physical and psychological sense [1,2]. Exactly because of their great motivation and desire for success, athletes are prone to neglect signs of over-training and so-called insignificant injuries which demand serious intervention of a coach or medical staff [3].

### Case Study

#### **Pain in muscles which draw upper leg**

#### **Description**

In racing, throwing and jumping disciplines acute pain very often occurs in upper leg area and loin area of athletes, and most often it occurs during the movements of twisting and turning (athletic throws, athletic jumps). During the performing of those movements, big

muscle forces, which are a few times bigger than the weight of the jumper or thrower, affect the surface. As a consequence of those forces, what occurs is a significant reaction force of the surface on the body of the athlete. Athletes complain about sudden and sharp pain in loin area, followed by a feeling of heat. The pain causes discomfort and impossibility of further training. Also, their further engagement in sports activity comes to a question, as well as a possibility of competition termination. That is very often a hard decision and because of that it is important to react as soon as possible, when there is a possibility of obtaining good diagnosis and treatment.

### Diagnosis and treatment

By palpatory examination, the pain can be discovered in tendon – bone joint or local in abdomen muscles which draw upper leg. Any passive distancing and drawing near of the muscles with resistance, which, during the starting bending, and later on stretching of the knee and hip, are performed in different scope of movement, in order to put pressure on all elements of muscle group which draws upper leg, also causes discomfort [2,4,5]. Because of the clear situation and localisation, additional research is usually not needed. However, in some athletes with muscle and symptomatic muscle-tendon joint, a clear disruption of the muscles can appear during ultrasound. The change which causes discomfort in tendon-bone joint is hardly seen during ultrasound and can be more clearly seen during magnetic resonance screening, except if deterioration occurs, in which case not even magnetic resonance is purposeful.

### Treatment

Acute treatment consists of applying of non-steroid anti-inflammatory medicine and in suitable rehabilitation protocol [5,6]. Improvement of the athlete's state is followed by exercises of eccentric strengthening of the muscles and appropriate muscle groups. Local corticosteroid injection is given if the patient does not react to previous therapy (usually pain in tendon-bone joint appears). If the pain appears again, some other pathological occurrence may be seen as a possibility, especially if the athletes are older, in which cases the appearance of symptoms points to tendinosis of muscles adductors. Just like in Achilles and other tendons, pathological change of the tendon is more often recognised as a cause of further symptom occurrence. Eccentric muscle strengthening is often named as a subject of numerous researches because it represents a starting point in treatment of such states, with extended recovery period up to four months, which represents a big problem for athletes [7].

### Pain in quadriceps muscle

#### Description

From anatomical aspect, quadriceps muscle group (mm.quadriceps femoris) also includes front knee connection which fixes the patella. It is often injured due to activity of eccentric load on muscles which connect the two joints. Injuries are not surprising and they happen mostly in sports in which there is a fast muscle extension (stretching), for example low start in sprint running, high jump, shot put by rational variant, spear throwing etc. Avulsion of frontal lower thigh thorn in the place of joining of tertiary muscle rarely occurs in adults. True upper leg muscle (thigh) injuries usually relate to tearing of the middle part of the muscle, while in younger generations, apophysitis or avulsion of true upper leg muscle (thigh muscle) appears from the frontal lower thigh thorn.

#### Diagnosis

Diagnosis of this injury is confirmed by clinical examination. However, if avulsion fracture is a possible situation, X-ray or ultrasound is used for the confirmation of the diagnosis [8]. Ultrasound is used more often when the level of disruption which occurred due to injury is supposed to be determined, and also appearance of hematoma or possible increase of ossifying myositis. Myositis can appear after contusion, or later development of intra-muscle hematoma in the area of quadriceps muscle (mm.quadriceps femoris).

#### Treatment

Primarily, following of appropriate rehabilitation protocol is necessary. Since the repetition of these injuries is not rare due to inadequate rehabilitation, the athlete can return to activities only when it is determined that symptoms do not exist anymore.

### Pain in upper leg (thigh) hamstring

#### Description

Because there are numerous structures in the back part of the upper leg, the pain in the back area is diagnosed harder than in frontal thigh hamstring [4]. Acute injuries of back upper leg hamstring occur usually in sprinters during the sudden leg raise (Figure 1) Spasm, which occurs after the injury, can cause different levels of leg weakness [9].



**Figure 1:** Tyson Gay-USA (Track and Field: 100m, 200m, 400m, Relay 4 x 100m and 4 x 400m)<sup>1</sup> .

#### Diagnosis

Injury scope is determined based on clinical examination. Serious injuries are classified as third-level injuries. The pain appears due to tendon stretching and in tests with additional loads, during which the athlete usually manages to localise the pain in an injured area. Ultrasound is a useful diagnostic method in this case as well and it is used for evaluation of the seriousness of the injury and in case of deep muscle tearing and for finding of possible hematoma. Injuries which require starting point of back thigh hamstring muscle tendon are more frequent in adolescents and can be clearly noticed on X-ray [8,10].

#### Treatment

It is necessary to follow usual guidelines. Besides that, accelerated programs have shown to be very successful in decrease of time spent on treatment, and the only downside of this approach is the possibility of injury reoccurring [6].

Avulsion injuries in athletes usually occur after a long recovery period. Surgical intervention is usually not needed, except if a big tendon fragment separation occurs and the recovery proves not to be successful. If it is needed, attachment of the torn part is conducted surgically [11]. If the injury treatment proves to be unsuccessful, chronic damage to back thigh hamstring muscle tendon can occur, because seating nerve stretches near long head of biceps thigh muscle. Exactly at that problematic point, the nerve may be affected by tissue damage. In some cases, surgical intervention is necessary [2].

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Eugene<sup>1</sup>- July 05: Tyson Gay falls to the track in pain at the back turn of the men's 200 meter quarter-finals during day seven of the U.S. Track and Field Olympic Trials at Hayward Field on July 5, 2008 in Eugene, Oregon. (Photo by Jonathan Ferrey/Getty Images)

### Conclusion

Acute pain in the area of loin and upper leg is a very big problem for all athletes. Acute injuries are most often caused by unexpected sudden explosive and strong movements. The slightest, seemingly harmless injury of the mentioned muscle groups can harm the athlete for a longer period, which certainly is not good news. It is not good either for an athlete or for trainers who carefully choose and strive to achieve good results, especially if the injury occurs during the competition period. It is utterly important to observe this problem as soon as possible and establish a good and accurate diagnosis by using modern medical devices and commence adequate treatment. The extent to which this treatment will be successful depends largely on the degree of the injury, the time of noticing of injuries, good rehabilitation and the physical predispositions of each individual contestant.

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