

Muscle injuries of the triceps surae

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Triceps surae muscle is comprised of the gastrocnemius and s, which insert together in the posterior aspect of the calcaneus. Innervation comes from the medial sciatic popliteus nerve (S1-S2).

Ethiopathology

- 1) Direct trauma: injury may be caused by collision against another player, hard object or floor; type and severity of injury will be determined by the violence of the trauma and whether the muscle was relaxed or contracted.
- 2) Indirect trauma: very specific of sports activity and caused by a greater demand than the muscle's contraction and elasticity properties. Take off and landing in jumping, acceleration or deceleration in sprinting, zig-zag running, kicking or movements against resistance may all increase injury occurrence. Predisposing factors: a) lack of training or training errors: special mention to a proper warm-up and cool down, as well as to choosing the right sports wear and material. b) Hygienic and nutritional errors: insufficient sleep, rest or rehydration, imbalanced diet, extreme temperatures and doping substances (anabolic). c) Individual criteria: age and not sex appears to be an important predisposing factor in injury risk and mainly in muscle injury location. Some authors relate a low maximal oxygen consumption with a higher injury risk.

Clinical Classification

Grade I muscle strain: refers to muscle excessive stretching, contraction or benign contusion, where there is just a simple tissue and chemical disarray or microscopic injury. Injury circumstances may not be reminded and pain appears late or with low intensity allowing the athlete to continue with his activity. Although muscle appearance and mobility are well preserved, palpation reveals a localized painful and contracted muscle. Active movements may be normal but painful when performed against resistance.

Grade II muscle strain: when there is more severe damage with rupture of several muscle fibres and local bleeding. The take off phase, sudden acceleration or deceleration and a violent contusion may be cited among the most common mechanisms of injury. Pain is intense, of sudden onset and sometimes with a pinpoint sensation. The athlete needs to quit his activity and may limp. Inspection reveals a late echymosis and surface modification. Palpation reveals localized or diffuse pain. Muscle mobility is diminished and active movement painful.

Grade III muscle strain: where there is a partial or total muscle rupture. Mechanism may be any of the already mentioned or a violent kick (rectus femoris). An audible pop is followed by immediate and intense pain. The athlete is not able to continue his activity and shows a marked limp or is unable to walk. A very painful palpable defect, also visible on inspection, is present together with swelling, induration and tenderness of the affected area. Muscle mobility is diminished or absent and active movements are painful and weaker.

Diagnosis

Diagnosis should be based in: a) detailed description of the mechanism of injury and onset of pain. b) Precise palpation focused on localizing the pain, contracted area or defect. c) Muscle echography, NMRI, etc. The differential diagnosis is with: Achilles tendon rupture, medial gastrocnemius avulsion, arteritis and phlebitis of lower limbs. Complications (ossifications, blood cystis, infected blood collection. Thrombo-phlebitis, fibrous scars, persistent residual pain) are almost always secondary to some error and may remain unmasked for a long time. Reinjuries are due to too early or intense return.

Treatment

Phase I. Treatment during the first 72 hours should be based in early criotherapy, compressive bandage and non weight bearing. If needed mild pain relievers, but no antiinflammatories, may be used.

Phase II. With the definitive diagnosis and in agreement with the physiotherapists we establish the treatment protocol (manual, modalities and specific exercises). Recovery is monitored according to daily progress. Depending on the severity of the injury, this phase may last from 1 to 3-4 or even more weeks.

Phase III. The player starts training with a fitness coach specifically dedicated to injuries recovery. In continuous contact with the physician and physiotherapists, he establishes a physical and strength training program that will



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prepare the player for his return with the rest of the team. This phase will last 10 to 15 days.

Phase IV. Once the player starts training with his team-mates, his evolution will still be monitored and specific exercises and physiotherapy treatment recommended to avoid recurrences.

Errors that should be avoided: 1) Allowing weight bearing when the injury is severe. 2) Reducing the recovery period because of the pressure of coach and/or player. 3) Early massage of the injured area. 4) Immobilization with rigid cast (thrombosis risk). 5) Starting functional recovery before healing. 6) Injecting or trying to aspirate the blood collection (infection risk).