In football, as in other sports, muscle injuries can be either strain injuries or contusions from a direct external force. Muscle strain injuries are particularly common in female\(^1\) and male football players and account for: (i) approximately 10 - 30% of all football injuries;\(^2\) and (ii) 15% of more severe injuries.\(^3\) In elite football players muscle strain injuries account for an even larger proportion of injuries (31 - 43%).\(^4\) Such injuries occur most commonly in the thigh (8 - 22% of football injuries, mostly hamstring injuries), groin (hip adductors), and calf muscles.\(^5,6\)

A large number of studies have been conducted to identify possible risk factors for muscle strain injuries in football. The results of these studies show that the most important risk factors for such injuries are previous injuries (hamstring and groin),\(^7\) reduced muscle strength and muscle strength imbalances (reduced hamstring to quadriceps strength ratio),\(^7,8\) reduced pre-season range of motion (ROM),\(^9,10\) reduced core muscle strength, and delayed activation of the transversus abdominis muscle.\(^11\) The following were not identified as significant risk factors for hamstring strains: age, body size, limb dominance and playing position.\(^12\)

Diagnosis of a muscle strain injury is based on a detailed history of the mechanism of injury and the presence of symptoms (acute pain, loss of function, swelling). A careful clinical examination to determine the exact anatomical location and grade of the injury is needed. Soft-tissue diagnostic ultrasound and magnetic resonance imaging (MRI) are very important special investigations that will assist the specialist in confirming the clinical diagnosis of a muscle injury.\(^13\)

The treatment of acute muscle strain injuries has been reviewed\(^14\) and is based on the stage of the injury. The immediate management of a player who has just sustained an acute muscle strain injury is: (i) to remove the player from the field; (ii) to apply ice (5-minute intervals for 4 sessions, every 60 minutes) and compression to the area; and (iii) to elevate the limb. In the acute inflammatory phase (2 - 72 hours after injury) the management principles are to use analgesics (paracetamol with/without codeine) in the first 24 - 48 hours, and to avoid the use of non-steroidal anti-inflammatory drugs (NSAIDs) as there is evidence that these agents may have a negative effect on tissue healing. Clinical assessment should be repeated at 24 - 48 hours, and if signs of inflammation are still present a short course (5 - 7 days) of NSAIDs may be commenced. In the early repair phase of a muscle after injury, mobilisation and use of therapeutic ultrasound (in the first 7 - 10 days after injury) have been shown to improve healing of muscle tissue.\(^15\) In recent years there has been considerable interest in the potential use of growth factors and stem cells to improve healing\(^16\) in the early repair phase. Currently, the most popular technique is platelet-rich plasma (PRP) injections.\(^17\)

In general, these techniques are promising but require further scientific investigation to determine efficacy and safety. Currently, the World Anti-Doping Agency (WADA)'s rules related to doping state that intramuscular injections with PRP require a TUE (therapeutic use exemption – essentially an application for permission to use), but other forms of use (e.g. local infiltration) merely require a Declaration of Use (DoU). After the acute inflammatory and early repair phases tissue healing and remodelling take place. During this time active rehabilitation of the muscle injury is the main focus. Traditional rehabilitation, consisting of flexibility training and restoring of muscle strength, is important, but there is evidence that specific consideration should be given to the lumbar spine, sacro-iliac and pelvic alignment and postural control mechanisms.\(^18\)

Guidelines with regard to the return to play after a muscle injury are important for the attending sports physician, but there is no clear consensus on these guidelines.\(^19\) It is well established that there is a high risk of recurrent injury during the first 12 weeks after injury.\(^20\) The following are clinical guidelines for return to play after a muscle injury:

- There must be no pain, weakness, stiffness, tenderness or pain with muscle contraction.

- A full range of motion must be restored and the football player must perform normally during full functional sports-specific testing. It has been suggested that isokinetic muscle strength testing should show normal concentric and eccentric muscle strength (within 10% of the non-injured side) and normal muscle strength ratios must be present (concentric agonist/eccentric antagonist).

- Normal muscle activity patterns must be restored before the player can return to full play.

It has been shown that muscle strain injuries in football can be prevented by football-specific balance training in a dose-response fashion.\(^21\) Therefore, in addition to strengthening of the muscles,\(^22\) in particular eccentric training,\(^23\) neuromuscular and proprioceptive training are important components of a muscle injury prevention programme in football.\(^24\)

References


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