



Update Article

Hamstring injuries: update article[☆]

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ABSTRACT

Hamstring (HS) muscle injuries are the most common injury in sports. They are correlated to long rehabilitations and have a great tendency to recur. The HS consist of the long head of the biceps femoris, semitendinosus, and semimembranosus. The patient's clinical presentation depends on the characteristics of the lesion, which may vary from strain to avulsions of the proximal insertion. The most recognized risk factor is a previous injury. Magnetic resonance imaging is the method of choice for the injury diagnosis and classification. Many classification systems have been proposed; the current classifications aim to describe the injury and correlate it to the prognosis. The treatment is conservative, with the use of anti-inflammatory drugs in the acute phase followed by a muscle rehabilitation program. Proximal avulsions have shown better results with surgical repair. When the patient is pain free, shows recovery of strength and muscle flexibility, and can perform the sport's movements, he/she is able to return to play. Prevention programs based on eccentric strengthening of the muscles have been indicated both to prevent the initial injury as well as preventing recurrence.

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Lesões dos isquiotibiais: artigo de atualização

RESUMO

As lesões dos músculos isquiotibiais (IT) são as mais comuns do esporte e estão correlacionadas com um longo tempo de reabilitação e apresentam uma grande tendência de recidiva. Os IT são compostos pela cabeça longa do bíceps femoral, semitendíneo e semimembranoso. A apresentação clínica do paciente depende das características da lesão, que podem variar desde um estiramento até avulsões da inserção proximal. O fator de risco mais reconhecido é a lesão prévia. A ressonância magnética é o exame de escolha para

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o diagnóstico e classificação da lesão. Muitos sistemas de classificação têm sido propostos; os mais atuais objetivam descrever a lesão e correlacioná-la com o seu prognóstico. O tratamento das lesões é conservador, com o uso de medicações anti-inflamatórias na fase aguda, seguido do programa de reabilitação. As lesões por avulsão proximal têm apresentado melhores resultados com o reparo cirúrgico. Quando o paciente está sem dor, apresenta recuperação da força e do alongamento muscular e consegue fazer os movimentos do esporte, está apto para retornar à atividade física. Programas de prevenção, baseados no fortalecimento excêntrico da musculatura, têm sido indicados tanto para evitar a lesão inicial como a recidiva.

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Introduction

Historically, hamstring (HS) injuries are described as frustrating for athletes as they are correlated with a long rehabilitation time; they have a tendency to recur and return to sport is unpredictable.^{1,2}

Not all injuries are similar. They range from mild muscle damage to complete tear of muscle fibers. Furthermore, as with the characteristics of the lesions, rehabilitation time is also variable.^{3,4}

HS injuries are the most common in sports. They are the most frequently reported injuries in soccer, accounting for 37% of the muscular injuries observed in that sport, which is the most popular in the world, with over 275 million practitioners.^{5,6}

Injury incidence is estimated at 3–4.1/1000 h of competition and 0.4–0.5/1000 h of training. A mean increase of 4% per year has been reported; the rate of injuries occurring in training sessions has increased more than that of those occurring during competitive activities.^{7,8}

After the injury, runners need 16 weeks, on average, to return to sport without restrictions, while dancers can take up to 50 weeks. In professional soccer, the athlete remains, on average, 14 days away from competitive activities. HS injury is the main cause of injury absence.^{2,7,9,10}

In addition to soccer, injuries are common in sports such as football, Australian football, track and field, and water skiing. The most common trauma mechanism is indirect trauma; injuries tend to occur during non-contact activities, and running is the primary activity. Sports that require ballistic movements of the lower limb, such as skiing, dancing, and skating, are associated with proximal avulsion of the HS tendons.^{3,11}

The myotendinous junction (MTJ) is the most vulnerable part of the muscle, tendon, and bone junction; the more proximal the injury, the longer the return to sport activity.^{11,12}

Of all muscle injuries, those of HS have one of the highest recurrence rates, which is estimated to range between 12% and 33%. Recurrence is the most common complication of HS lesions.^{2,6,7}

Anatomy

The HS muscle group consists of the semitendinosus (ST), semimembranosus (SM), and the long head of the biceps femoris (LHBF). These three muscles originate in the ischial tuberosity (IT) as a common tendon, passing through the hip and knee joints; they are biarticular muscles and are innervated by the tibial portion of the sciatic nerve. In the posterior region of the thigh, the short head of the biceps femoris (SHBF), which originates in the posterolateral region of the femur in the linea aspera and in the supracondylar ridge, is added to the HS group. Thus, the SHBF is a monoarticular muscle innervated by the common fibular nerve (Fig. 1).^{2,3,5}

In an anatomical study of the HS, Van der Made et al.¹¹ described that the HS is divided into two portions, upper and lower. The upper portion is subdivided into two facets. The lateral facet is the origin of SM, whereas the medial facet is the origin of the ST and LHBF, which also has origins in the sacrotuberal ligament.²

The ST and SM extend to the posteromedial region of the thigh, with insertions in the pes anserinus and the posteromedial corner of the knee and tibia, respectively. In an agonistic pattern, these muscles act in knee flexion and medial rotation, as well as in hip extension; laterally, the LHBF acts in an isolated manner proximally, extending the hip and posterior stabilizing the pelvis. The distal tendon that is inserted in the head of the fibula is formed distally, after the addition of the SHBF fibers, which flex the knee with the thigh in extension.^{1-3,5}

To date, no hypothesis has been able to correlate injury patterns with the anatomical structure based solely on the length of the muscle, tendon, or MTJ. It is thought that the muscular architecture, due to the proximal and distal orientations of the tendons, leads to a resulting force that is misaligned with the muscular fibers, predisposing to injury. A tendinous structure in the ST divides it into two parts. This raphe may play a role in protecting against gross injuries of this muscle.¹¹

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