Soft Tissue Injuries

- Acute muscle injuries
- Achilles tendon injuries
- Groin injuries

Please note that the material in these pages is presented as a general guide to sports injuries and should not be regarded as specific advice on any individual's injury, diagnosis or treatment. We welcome any general comments and suggestions about the content of these advice pages.

Patients suffering acute muscle injuries

1. A careful history and clinical examination is required to establish a correct diagnosis of soft tissue injury with bleeding or muscle rupture.
2. The extent of a muscle injury and bleeding can be confirmed with ultrasound, MRI, or CT, where ultrasound is primarily recommended because of availability and low cost.
3. A pressure bandage (tightly drawn elastic bandage) tied as soon as possible after the injury is the most important measure in the acute phase of management of a soft tissue injury. The bleeding stops immediately when the pressure is applied.
4. Icing, elevation and rest do not reduce the blood flow in the musculature to an extent that can influence acute muscle bleeding.
5. If a large partial or total muscle rupture or extensive muscle bleeding is suspected, the patient should be referred immediately to a specialist.
6. A subtotal or total muscle rupture should be operated acutely if the bleeding is extensive and there is a risk of development of compartment syndrome. A corresponding injury can be operated at a later stage if the function is poor, agonists are lacking or are too few, or if calcification (myositis ossificans) makes it impossible to attain good function. Special consideration should be taken with resuturing of musculature (many anchors that are knotted together) to attain optimal durability of the sutures.
7. Activity improves durability in the healing muscle tissue. Full loading after an extensive partial rupture requires 6-8 weeks of progressive mobilization. Physiotherapy should thus be started as soon as possible after the injury.
8. Inactivity and immobilisation impair the durability of the healing muscle tissue and delay the return to free activity.
Patients suffering from Achilles tendon injuries

1. Different etiological factors and diagnoses should be considered with long-term pain conditions in and around the Achilles tendon. A chronic condition is defined as a condition that has symptoms lasting 2-3 months which remain despite adequate non-operative treatment.

2. Physical activity is probably etiologically important. Between 20% and 30% of patients, however, do not associate the symptoms with sports.

3. Training factors (extrinsic factors) and biomechanical deviations (intrinsic factors) are presumed to cause chronic Achillodynia, but scientific evidence for this is lacking. Rheumatological, infection and immunological factors as well as medical side effects (ciprofloxacin) should also be taken into consideration.

4. Epidemiological data with correct definitions and exposure are lacking. Textbooks state that Achillodynia make up 6-18% of sports injuries in the lower extremities.

5. If the macro- and micro-scopic findings are lacking, the symptomatic diagnosis should be based on the history and clinical examination. 
   **Proximal Achillodynia:** pain and tenderness in the middle or upper part of the tendon, often combined with a limited, palpable, hard resistance in the tendon. 
   **Distal Achillodynia:** pain and tenderness at the insertion of the tendon.

6. If surgical findings are available, a pathoanatomical diagnosis can be established.  
   **Tendinosis:** often a distinct resistance in the medial or central part of the tendon. The cross-section is matt and greyish in colour and the fibre structures are partly destroyed. The pathogenesis and etiology are not clearly understood. 
   **Partial rupture:** macroscopically distinct continuity breaks engaging a part of the tendon. 
   **Paratendinitis:** infiltration of inflammatory cells in the paratenon or in the peritendinous connective tissue. 
   **Tendinitis:** infiltration of inflammatory cells in the tendon.

7. The diagnosis is often established clinically. Changes in the tendon can be shown with ultrasound or MRI.

8. According to present experience, an evaluation for surgery should be made 3 months after the onset of the symptoms, after non-operative treatment including alternative training and muscular (eccentric) training. Surgery can be performed in the outpatient clinic under local anaesthesia, aimed at removal of the devitalized tissue and peritendinous adhesions.

9. Cortisone should not be injected in or near the Achilles tendon in athletes with chronic Achillodynia. The effect is doubtful in the short term. The risk of side effects can be great.

10. Immobilization can be used for a short time: up to one week for acute Achillodynia, and for up to two weeks after surgical treatment. This relieves pain and speeds up the wound healing. However, negative effects on durability greatly counteract the short term symptom relief.
11. Acute rupture of the Achilles tendon gives rise to typical symptoms in the form of a sudden stabbing pain. Also, the patients tend to seek acute medical care. This condition is characterized by an inability to do a strong plantar flexion, a positive Thomson's test and the finding of a defect in the ligament on palpation. With a typical history and the above clinical findings, the ligament rupture is always total.

12. The treatment of an acute Achilles ligament rupture is based on individual demands on function. Young people and physically active individuals should be operated on in the acute period. Early mobilization is recommended, but it takes between three and six months of rehabilitation for full strength of the ligament to be regained.

Athletes suffering from groin pain

1. The definition of groin pain in athletes should be based on the symptom picture and may relate to a number of conditions that cause pain in the groin region.

2. As consensus on definition and diagnosis is lacking, there are no valid epidemiological data. The incidence of groin pain in football players has been estimated to be 0.8/1000 hours exposition.

3. Injuries to the adductor-tendon and/or muscle are the most common diagnosis. Causal association between the patient's groin pain and clinical palpation tenderness over adductor musculature is not established. Hemiography shows that hernia or abdominal-wall weakness is present in many athletes with groin pain but also in many asymptomatic cases. Causal association between pathological herniography and the patient's pain has not been shown. Commonly occurring diagnoses include nerve entrapment, stress fractures in the femoral neck and pelvis, urogenital conditions and pain radiation from the back.

4. Trauma and loading or inflammation can be the genesis of the groin pain. Traumatic injuries can include rupture of the adductor tendon or muscle. Overuse conditions include stress reactions in the pubis or stress fracture of the pubic ramus. Inflammatory conditions can include tenoperiostitis, prostatism, lymphadenitis and sacroiliitis.

5. Pain associated with a hernia can come from: (1) the hernial sac itself (2) contents of the hernial sac (3) the tissues affected by the sac or by the failing posterior wall of the inguinal canal. Possible explanations for the pain are an expanding hernia with stretching of the peritoneum, a narrow hernia canal where the hernia contents and peritoneum can be incarcerated, and an increased abdominal pressure with Valsalva's maneuver and exertion can spread via the hernia and cause nerve entrapment. Local anatomical conditions and the particular developmental stage of a hernia will influence the symptoms.

6. Chronic groin pain with a duration of over a month, which has already been treated with rest and possible anti-inflammatory medication, is
both difficult to diagnose and to evaluate. This can depend on the clinical picture and be made more difficult due to secondary symptoms.

7. Indication of surgical treatment depends on the duration of the symptoms, the way the symptoms affect the patient, the treatments which have been tried, the investigations which have been carried out and the findings of these investigations.

8. There are no documented preventive measures. Stretching of the adductor musculature and strengthening of the adductors and abdominal muscles as well as a gradual increase in training to avoid overuse have been put forward as possible methods of preventing groin injuries.

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