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ILIOPSOAS INJURY IN SOCCER PLAYERS

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ABSTRACT

Injuries to the iliopsoas muscle are rarely mentioned in the literature dealing with soccer-related trauma.

This report describes our experience in the successful diagnosis and treatment of iliopsoas injury in 40 professional soccer players. These injuries were not associated with direct external trauma to the muscle.

Anatomical and functional characteristics of the iliopsoas are reviewed as they relate to the diagnosis and to the treatment by direct local injection with corticosteroids. A safe anatomical approach to the iliopsoas below the inguinal ligament is described.

INTRODUCTION

Sports trauma varies greatly with different types of athletic activity. Collision sports such as American and Rugby football usually involve fractures and head injuries, whereas contact sports like soccer primarily produce trauma to joints, tendons and muscles of the legs (Ekstrand and Gillquist, 1983; Muckle, 1981). In many instances the abdominal muscles are also involved. Muscle injuries are usually caused by either direct trauma or strain. The diagnosis and treatment for most of these injuries has been well defined (Genety and Brunet-Guedj, 1980; O'Donoghue, 1970).

We observed a group of professional soccer players in whom the location and pattern of the pain were different from those previously described in the literature (Fig. 1). The pain was located in the lower abdominal quadrants, either unilaterally or bilaterally, frequently with radiation to the groin. These athletes presented a typical pattern of complaints. They denied direct trauma to the involved area. Characteristically the pain disappeared at rest and reappeared while playing. None of the players responded to conventional treatment and each became a diagnostic and therapeutic challenge. This group constitutes the basis of this report.

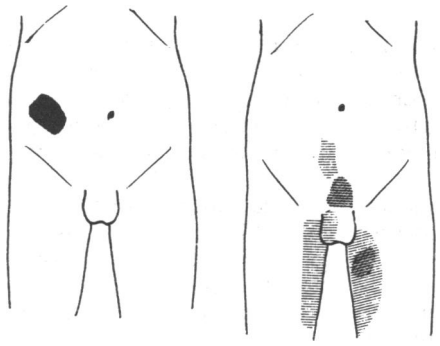

Fig. 1: Right — *Common sites of known musculotendinous pain syndromes;* Left — *Area of pain and tenderness in the iliopsoas syndrome.*

MATERIAL

During a period of two years 42 soccer players with the aforementioned pattern of pain were referred to us by their coaches and physicians. All were men, with an average age of 24 ± 4 years. All had previously undergone conventional treatment of muscle "overuse" injury such as rest, analgesics, systemic anti-inflammatory agents and local injections of procaine hydrocloride (Novocain) into the lower anterior abdominal wall.

DIAGNOSIS

The clinical signs were fairly uniform. All players exhibited lower abdominal pain, for the most part lateral to the rectus abdominis muscle and above the inguinal ligament. The pain was aggravated by effort, associated with flexion of the hip joint and the motion of forward kicking of the ball. There was no history of direct trauma to the area where the symptoms presented in any of the patients nor was there a history or signs of any trauma to other organs. The pain corresponded strictly to the location of the iliopsoas muscle or its tendon. It could be provoked by pressure on this area. Functional iliopsoas derangement could also be demonstrated. With the patient supine, active flexion of the thigh was performed against resistance by the hand of the examiner with or without simultaneous pressure on the muscle in the iliac fossa (Fig. 2). In some of the players abdominal wall tenderness was also observed, most frequently in the lower part of the rectus abdominis muscle. To exclude osseous or other injuries, roentgenographic and ultrasonic examinations were done. Osteitis ossificans of the pubis was revealed in one player and avulsion of the lesser trochanter in another. These two patients were excluded from the series. No pathological findings were found in any of the other players. Since the location of the pain corresponded strictly to the iliopsoas muscle and its tendon, iliopsoas injury was diagnosed. Myositis ossificans of the iliopsoas muscle has been described as a complication following tetanus by Thorseth in 1968.

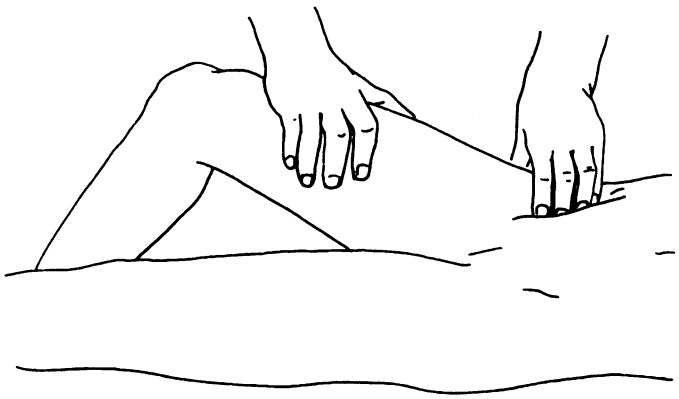

Fig. 2: Method of examination to elicit pain and tenderness in the iliopsoas syndrome.

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TREATMENT

With the diagnosis of iliopsoas involvement, this group of patients underwent treatment with corticosteroid in procaine solution injection to the specific area. With the patient supine, the muscle was palpated in the iliac fossa and below the lateral part of the inguinal ligament (Fig. 3). Localisation of the site of injection was aided by direct palpation and provocation of pain. Forty milligrams of methylprednisolone (Depomedrol) in 4-5 ml of Novocain 2% were injected subfascially to a depth of 1-1½ cm so that the injected material would disperse over the whole area of the muscle. All patients were followed for a minimum period of six months from the last injection.

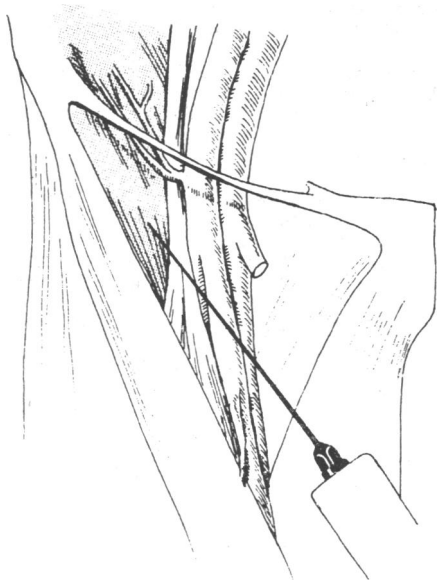

Fig. 3: The anatomy of the iliopsoas muscle in the region of the inguinal ligament and the site of the safe therapeutic injection.

RESULTS

Injection through the lower anterior abdominal area into the muscle was carried out in 40 patients. Thirty-five had immediate satisfactory results and after 2-3 days of rest returned to their usual athletic activities. In five patients recovery was delayed beyond the expected period and an additional injection was performed. In 10 players symptoms returned within a month and they required up to three repeated infiltrations. Subsequent to the last injection, the patients were free of symptoms or findings on examination for the duration of the follow-up (minimum of six months).

Complications from the procedure were all minor and temporary in nature. Regional anaesthesia lasting for 1-2 hours occurred in the area of distribution of the lateral femoral-cutaneous nerve in 24 patients and in the femoral nerve distribution in one instance. The latter was the result of an incidental infiltration of the femoral nerve at the level of the inguinal ligament. The injection is directed to the muscle lateral to the neuro-vascular bundle, to attempt to avoid nerve involvement.

DISCUSSION

The purpose of this report is to call attention to a relatively common soccer injury, namely, injury to the iliopsoas muscle and its tendon. Despite the relative frequency of this condition, it has received only cursory mention in the literature (Ekstrand and Gillquist, 1983; Genety and Brunet-Guedj, 1980, O'Donoghue, 1970).

The psoas major and the iliacus muscles originate retroperitoneally within the abdomen and a major portion of both muscles lies in the retroperitoneal space. Due to this anatomical location, iliopsoas pain, sometimes referred to as "iliopsoas syndrome", is a condition known to simulate a number of intra-abdominal pathological conditions such as appendicitis, gynaecological disorders and femoral or inguinal hernia (Bentley, 1981; Glauber et al, 1967).

The two muscles enter the thigh behind the lateral part of the inguinal ligament and merge to form the iliopsoas tendon which inserts into the lesser trochanter of the femur and into the area below it (Fig. 4). The muscle is covered by a fascial sheath which may communicate with the capsule of the hip joint forming a synovial bursa. The lateral cutaneous femoral nerve is included in the sheath anteriorly. Below the inguinal ligament the iliopsoas muscle emerges superficially. Here it is not covered by other structures and is lateral to the bordering neurovascular elements. Thus this is the area where it is most accessible for safe percutaneous injections.

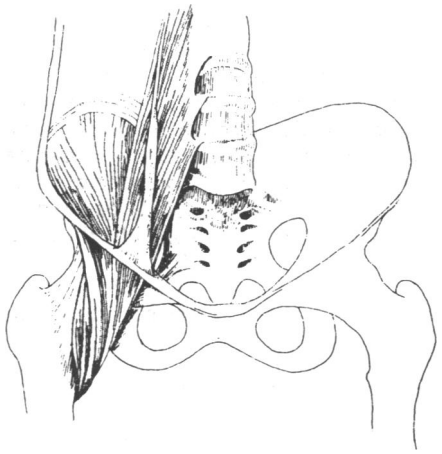

Fig. 4: Anatomic configuration of psoas major and iliac muscle.

The iliopsoas muscle is the most important flexor of the thigh. Flexion of the thigh by the iliopsoas muscle produces slight rotation of the femur because of the relation of the muscle to the axis of rotation of the femur. When sitting with legs outstretched, the heels can be elevated only by action of the iliopsoas muscle, other flexors of the thigh being inactive (Ludloff's sign). When the muscle is injured, this action cannot be performed without resulting pain. Iliopsoas derangement can also be demonstrated with the patient supine when flexion of the thigh is performed against opposition by the hand of the examiner with simultaneous pressure on the muscle in the iliacus fossa or below the inguinal ligament (Fig. 2). This sign was positive in all patients. Ludlof's sign is described clearly by Thorseth (1968).

When the lower limbs are in line with the trunk, the rectus femoris and other muscles assist in flexion of the hip. When the lower limbs are not aligned with the trunk, the iliopsoas muscle may be forced to act without participation of other flexors, resulting in excessive strain. It is assumed by some such as Fitzgerald (1969) and LaBan et al (1965) that the iliopsoas muscle is exposed to injury when flexed maximally and then forced to stretch. These conditions occur in the game of soccer.

The pathogenesis of the iliopsoas injuries may be either a tear, a haematoma, or, less frequently, ruptures or synovitis (Gertzbien and Evans, 1972; Glauber et al, 1967; Kohaus et al, 1980, Penkava, 1980). The diagnosis should be based on both history and physical findings. A roentgenogram will demonstrate pathological changes in bony structures, particularly in the area of origin of the psoas muscle, namely, the L_2-L_5

vertebrae, or at the tendinous insertion (i.e. lesser trochanter). Intervertebral disc injury should be considered. Involvement of intra-abdominal organs in proximity to the iliopsoas muscle should be excluded.

Although the exact pathology of iliopsoas muscle injury has not been well defined, local subfascial injection of steroids has frequently been used in its treatment. This approach is based on the potent anti-inflammatory action of certain corticosteroids (Bentley, 1981).

When using corticosteroid in this manner, several factors should be considered: The anti-inflammatory action, the local and systemic effects, and the dosage and volume used. Systemic side effects have not been reported with infrequent, low dose, local injections of steroid, but local side effects have occurred. The most frequently reported side effect has been subcutaneous atrophy of the skin associated with depigmentation, teleangectasis and striae (Beardwell, 1967; Bentley, 1981). No such side effects were encountered in our series.

It is stressed in the literature that corticosteroids should not be injected into tendons since this can lead to tendon degeneration and rupture (Bentley, 1981). Whether this damage is caused by a direct steroid effect or is the consequence of the injected volumes of fluids into dense avascular tissue is uncertain. It is, however, a preventable complication. Performed correctly, the injection should be directed accurately into a definite synovial or fascial sheath, thus avoiding injection into a tendon.

Treatment with injection of steroids should be considered with the diagnosis of iliopsoas injury. The injections should be subfascial to a depth of 1-1½ cm via the accessible area of the muscle (Figs. 1 and 3).

In summary, this report describes our experience in the diagnosis of iliopsoas injuries and their successful treatment using direct subfascial injections of corticosteroids.

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