

Groin pain in athletes – modern perspective

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Nonoperative treatment of chronic groin pain is long lasting and recurrence is quite common. Sports hernia and adductor tendinitis/tendinosis coexistence in a single patient is described in the literature. Several studies evaluated operative treatment that should enable pain elimination and fast return to sports activities.

Surgical procedures used for treating chronic groin pain should address the common causes of pain in this region. The literature shows us that adductor tendinosis occurs in one quarter of cases with sports hernia or may be present as isolated, and are to be treated in both cases by tenotomy. Genital branch of genitofemoral nerve resection together with ilioinguinal nerve neurolysis should also be performed in patients with sports hernia.

Gilmore's groin (1), groin pain syndrome (2), sportsman hernia, groin disruption, are the terms in literature trying to describe the syndrome encountered in athletes. It consists of chronic pain in pubic region, aggravated by athletic activity, and is found mostly in soccer and hockey players. Despite the conservative therapy and period of rest the pain tends to reoccur upon resumption of sport activities (3). A number of conditions have been described as cause of this syndrome. Many studies identified the cause of groin pain as sports hernia, adductor tendinopathy, obturator nerve entrapment and osteitis pubis (4). Conservative treatment is long-lasting and recurrence is common.

Surgical findings

Gilmore (1) described three typical surgical findings in groin pain: a torn external oblique aponeurosis, torn conjoined tendon and dehiscence between the torn conjoined tendon and the inguinal ligament. Another important cause of groin pain is enthesopathy at the site of insertion of the abdominal and the adductor muscles to the pubic bone (5,6). The adductor longus and the gracilis are generally affected. The rectus abdominis, the pyramidalis and the lateral aponeurosis of the obliquus externus abdominis, although not as frequently (5,7,8).

Frequent coexistence of adductor tendinitis/tendinosis and sports hernia in a single patient is described (9). Tissue contraction during embalming procedures is deforming perception during anatomical studies of pubic region (10). In the literature conjoint tendon is described as fusion of transversus and internal oblique muscle that inserts on to the pubic tubercle. There are reports claiming that these tendons do not actually insert on pubic tubercle but on rectus sheath above the pubic tubercle. Therefore constant straining in athletes commonly produces shearing at the level of external inguinal ring and not at the tubercle and symphysis level (7,11). That finding correlates with intraoperative findings of Gilmore and other authors performing herniorraphies for sportsman hernias claiming abnormality in external inguinal ring as a cause of pain. Posterior wall weakness and external inguinal ring dilatation produces genitofemoral nerve entrapment. Entrapment occurs at two levels, at the level of posterior inguinal wall where it penetrates and at the level of external inguinal ring (12–14).

Groin pain can also be caused by compression of the cutaneous branches of nerves found in this area. From Akita et al. results it is evident that the courses of the genital branches vary considerably, and it may have an important role in chronic groin pain produced by groin hernia (13). Entrapment by the ligaments

may be a reasonable candidate for the groin pain suffered by athletes. Posterior wall weakness of inguinal canal which cause entrapment of the genitofemoral and ilioinguinal nerve branches is also identified as a potential cause of chronic groin pain by some authors (5,15,16).

Other, rare causes of groin pain are femoroacetabular impingement, osteitis pubis, stress fractures, avulsion fractures, snapping hip syndrome, bursitis, hip joint pathology, traumatic myositis ossificans, referred lumbosacral pain, nerve entrapments/irritations, genitourinary abnormalities and intra-abdominal disorder (1,9,17,18).

Discussion

The highest frequency of groin pain is observed in soccer, ice-hockey and rugby. Chronic groin pain can cause disabling symptoms in athletes. Conservative treatment is often long-lasting and often fails and athletes are faced with the threat of career ending.

As seen in literature groin pain is a complex overuse syndrome with a number of potential causes. Sometimes it is very difficult to pinpoint a single entity and many papers agree on multiple causes of groin pain. The most frequent finding in such patients is the disruption of conjoined tendon from pubic tubercle and disruption of external oblique muscle aponeurosis (Gilmore).

Disruption of posterior inguinal wall is pinpointed as the main cause of pain by many authors that treated chronic groin pain. Multiple and different pathologic finding often coexist in a single patient. Akita et al concluded that ilioinguinal and genital branch of genitofemoral nerve may be the most critical nerves in etiopathology of chronic groin pain. Muschaweck et al described genitofemoral nerve entrapment along with posterior wall weakness as a complex cause of pain in sports hernia. Number of papers present adductor tendinosis as the leading cause of pain in this region and adductor tenotomy reporting good results in the treatment of chronic groin pain (9,16). The cause of all of these conditions is chronic repetitive stress at the abdominal – adductor junction and are inseparable.

This range of findings are suggestive of common etiology overuse syndrome that develops in one direction but does not exclude the coexistence of other pathological conditions. Overuse injuries caused by repetitive stress and muscle imbalance tend to progress towards chronic injuries of the groin that can manifest

themselves in a range of predominantly occult hernias, adductor tendinosis, nerve entrapment syndromes.

In order to reduce the pathology to a minimum it is absolutely necessary the correct balance between the adductors and abdominal muscles. Frequent cause of pathologic changes in groin area is disbalance in strength of adductor and abdominal wall muscles (5). Two conditions may occur concomitantly in the same patient, osteitis pubis and chronic adductor tendinosis, and it may be difficult to distinguish one from the other. Positive lateral compression test and pain over the pubis, helps distinguishing osteitis pubis from other conditions, such as chronic adductor tendinosis. MRI of pubic region is recommended for distinction and should be performed obligatory in order to choose between operative or conservative treatment (19).

In case of operative treatment all pathologic conditions should be considered in order not to oversee an important cause of pain that can be present along with posterior wall weakness. Many papers note the importance of coexisting adductor tendinosis in patients with sports hernia. Coexistence of nerve entrapment neuralgia with sports hernia is also acknowledged (13,16,20). Ekstrand and Hilding found the majority of injured patients had more than one potential cause of pain (21).

Groin region has complex anatomy at the junction of three regions. Findings on fresh cadaver dissections speak in favor of a common etiology (7,8). Groin pain is an overuse syndrome of muscle to bone junction and - dependent on duration and type of sports - produces different predominant pathological findings (9,10).

Treatment of patient with chronic groin pain is complex and surgery has its role in it. It enables faster return to sports and recovery (5,16,20). Majority of patients have signs of occult hernia on physical exam and dynamic ultrasound, so reinforcement of posterior wall is necessary. After operative treatment of groin pain nerve entrapment can cause persistent pain and it is prudent and sufficient to resect genital branch of genitofemoral nerve and perform ilioinguinal nerve neurolysis (13,16,22). The most common cause of operative treatment failure is adductor tendinosis which is frequently present with the signs of sports hernia, but can occur as an isolated entity.

The key diagnostic method for sports hernia diagnosis is dynamic ultrasound of posterior wall of inguinal canal (8,23,20).

In order to avoid recurrence or failure of operative treatment the common causes of pain should be addressed and these are posterior wall weakness, adductor tendinosis and nerve entrapment neuralgia. One must also be aware of femoroacetabular impingement and osteitis pubis presence which can also lead to failure of surgical treatment. MRI should be obligatory in order to choose between surgical or conservative therapy in patients with symptoms of adductor tendinosis, osteitis pubis and femoroacetabular impingement (24,25).

Conclusion

Disruption of posterior inguinal wall is pinpointed as the main cause of pain by many authors that treated chronic groin pain. In cases of sports hernia Shouldice repair should be performed with resection of the genital branch of genitofemoral nerve and ilioinguinal nerve neurolysis. When adductor tendinosis is present, adductor tenotomy should be performed to enable resumption of presurgery level of activity, free of pain.

Dynamic ultrasound is the key in decision making in diagnosing a sports hernia that can be successfully treated surgically. MRI should be obligatory in order to choose between surgical or conservative therapy.

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