

Sports Hernia: What should we know?

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Abstract

Inguinal pain in sports patients is a clinical entity that presents considerable prevalence. The hernia of the sport consists of an abdominal pain syndrome in the lower floor of the abdomen and chronic inguinal pain with well-defined criteria for its diagnosis.

Conventional open or laparoscopic surgical treatment can be performed on failure of clinical treatment. The diagnosis and appropriate treatment for the hernia of the sport has been widely studied, still representing a challenge for its correct clinical and surgical management.

We review the results presented in the last 5 years regarding the evolutions in the diagnosis, clinical management and surgical treatment of the hernia of the sport in order to describe an updated review based on the current literature.

Keywords: Sports Hernia; Groin Pain; Pubalgia

Introduction

Sport hernia is a syndrome characterized by pain in the pubic and inguinal region presented by sportsmen, usually of high performance. In recent decades, it has been defined as chronic pain in the inguinal region, even though there is no consensus on its terminology (athlete's pubalgia, sports hernia, chronic inguinal pain syndrome and inguinal injury complex).

All the proposed terminologies describe a complex condition that is still poorly defined from the pathophysiological point of view however it has an incidence around 10 - 13% of all injuries presented by high-performance athletes [1,2].

Pain in the inguinal and pubic region also called tendon enthesitis of the long adductor muscle represents an important cause of withdrawal from sport for many athletes, demonstrating the importance of adequate diagnosis and treatment in this specific population.

The pubic region and a point where the kinematic forces intersect and the balance between the adductor and abdominal muscles determine the elasticity of the pubic symphysis, with wall weakness being a common cause of lingual pain [3].

Sportspeople commonly suffer from chronic inguinal pain and can become a debilitating condition, putting the athlete's career at risk. In most cases, the pain stems from a skeletal muscle problem, however for some patients it has been suggested that the pain may be attributed to a weakness of the inguinal canal [4].

Sport hernia and a controversial diagnosis of chronic pain in the inguinal region in athletes and physically active people, being a great diagnostic and therapeutic challenge, with no consensus based on available evidence to guide decision.

In 1980, Gilmore, *et al.* investigated a group of athletes with inguinal pain and started the hernia terminology of the sport, defining this condition as the enlargement of the external inguinal ring due to rupture of the aponeurosis of the external oblique muscle, joint tendon and dehiscence between the ligament inguinal and ruptured joint tendon [5,6].

This review aims to present current information on chronic lower abdominal and inguinal pain, on the complexity and treatment of which there is no consensus, as well as on our own clinical and practical experience.

Definition

Sport hernia as a new clinical condition has been defined with different terminologies, however inguinal pain in practitioners of high-performance physical activities configure this condition. It may accompany other pathologies that lead to inguinal pain such as tendinitis of the long abductor, pubic osteitis and pubic symphysisitis [7].

Inguinal pain usually has an acute onset and is mild with a location adjacent to the pubic tubercle, however there may be no clear evidence of the presence of hernias or other musculoskeletal conditions on physical examination, and at least three of the five clinical findings must be present to make the initial diagnosis of sport hernia [8]:

- 1) Sensitivity at the point where the joint tendon inserts into the pubic tubercle
- 2) Sensitivity to palpation of the internal inguinal ring
- 3) Pain or dilation in the external inguinal ring without evidence of hernia
- 4) Pain at the origin of the long adductor muscle of the thigh
- 5) Diffuse inguinal pain that extends to the perineum, inner thigh and crosses the midline.

Although there are different reasons for inguinal pain in athletes, we should not forget that there may be cases of inguinal hernia, sometimes asymptomatic, with sports hernia being a much more serious and limiting symptomatological injury, including the loss of pelvic stabilization during sport. Components associated with pelvic stabilization tend to be clearly compromised, such as inguinal rupture, pubic osteitis, adductor tendinopathy, obturator nerve shock and nervous irritation [9].

Pathology

Within the concept of sport hernia, the posterior wall of the inguinal canal (fascia transversalis) is weak, being present in more than 85% of patients investigated for inguinal pain with suspected inguinal hernia, being accompanied by weakness of the external oblique muscle aponeurosis [10]. This pathology cannot be seen in all cases, for this reason, other pathologies, such as dilation of the external ring, joint tendon injuries and dehiscence of the inguinal ligament should not be neglected.

Physical examination is essential for diagnosis and can help diagnose pathologies such as pubic osteitis, pubic branch rupture, bursitis, slippery epiphysis, acetabular damage, femuroacetabular impingement and early osteoarthritis [11].

During the maneuvers of the exam, not only the pathologies of the hip, but also the potentials of the abdominal rectus concomitant or damage to the adductor tendon should also be investigated. Pain in the lower and lateral parts of the inguinal ligament may be indicative of pathology of the hip or injury to the long adductor, while pain above the inguinal ligament may indicate pain related to the hernia of the sport. In addition, it must be remembered that damage to the hamstring muscle can also result in inguinal pain.

Clinical Presentation

Approximately 90% of patients are men and the main symptom is exercise-related inguinal pain. Pain is typically referred to the lower lateral aspect of the abdominal wall and may radiate to the testis, perineum, suprapubic region, long adductor branch and internal surface of the femur.

The pain starts slightly and gradually with a sudden onset, often worsening with active movement during sport, and may progress gradually to pain at rest or even during usual activities. The duration of pain is variable, between 1 and 2 days after exercise, evolving with a feeling of muscle stiffness and limited movement, decreasing with rest and returning with the beginning of physical activity [11,12].

During the physical examination, painful perception in the inguinal canal is evident at the Valsalva maneuver, and there is also increased sensitivity in the region close to the iliac crest ipsilateral to pain. The forced hip adduction test can be painful and the supine adductor compression test with hip flexion is usually positive [13].

The diagnosis of sport hernia should not be based only on clinical evaluation, but in the context of clinical history, physical examination and subsidiary imaging tests. After reviewing the literature, we considered that the diagnostic approach should be multidisciplinary, including orthopedists, physiotherapists, urologists and neurosurgeons in all cases.

Imaging methods

There is no consensus on the ideal imaging method for the investigation of sports hernia or for chronic inguinal pain, however secondary injuries such as bony or tendon injuries can be ruled out initially with specific imaging tests.

Simple radiography can reveal bone abnormalities, dysplasias, pathological fractures or even indicate bone resorption in osteitis. Bone scintigraphy can be used to diagnose stress fractures in suspected cases.

Magnetic resonance imaging (MRI) proved to be important in the evaluation of the athlete's inguinal region, not only because it allows the diagnosis of inguinal hernias as other pathologies such as pubic osteitis, hip osteonecrosis, soft tissue pathologies, bursitis and tendonitis. MRI has become the method of initial investigation in these patients, with some series presenting a sensitivity of the method for diagnosis of around 68% [14].

Omar, *et al.* published a pattern on MRI reinforcing its role in the diagnosis of sports hernia, listing reliable diagnostic findings such as identification of abnormalities in the fascial layers of the rectus abdominis and long adductor, tenoperiosteal dehiscence, edema of the rectus abdominis muscle and atrophy in the place of insertion of ligaments and pubic tendons [15].

Dynamic ultrasonography has shown to be a promising method for the diagnosis of sports hernia, being able to identify the protrusion of the transversalis fascia during Valsalva, being able to visualize even small protrusions in the posterior inguinal wall that are sometimes asymptomatic. Garvey, *et al.* claim that it is necessary to have a significant bulging in the inguinal canal in conjunction with damage to the joint tendon to consider the existence of sports hernia [16].

The combination of diagnostic methods can be very useful for the diagnosis, and most reports and case series recommend the use of at least ultrasound and MRI to confirm the diagnosis.

Conservative treatment

Sportsmen diagnosed with sports hernia should receive initially conservative treatment for 3 - 6 months with multidisciplinary monitoring in order to stabilize the pelvic pathology. The initial recommendation for active sportspeople is to rest for 4 weeks and use symptomatic medication (non-steroidal anti-inflammatory drugs) associated with intensive physical therapy.

After the initial treatment, the patient's reevaluation and rehabilitation with return to sports should be discussed with the multidisciplinary team with the athlete, seeking to optimize the quality of life and maintenance of the sports practice.

Surgical treatment

The indication for surgery is reserved for cases in which conservative treatment was not successful after at least 3 months of treatment, being decided together with the multidisciplinary team. Return to sports activities and activities can occur within 3 months after surgical treatment and in most cases without inguinal or pelvic pain.

Acceptable surgical options in most reviews are through the laparoscopic approach (PTE or TAPP) with or without the use of surgical screens in the region of the posterior wall [17].

There is still no evidence in the literature that the laparoscopic approach is more effective in treating pain than the open method, both producing good results with a response in 60 - 80 of operated patients [18].

Paajanen, *et al.* compared in a prospective randomized study laparoscopic surgery (PTE) with conservative treatment, finding superior results in patients operated on with early return to activities within 3 months with statistical significance between groups ($p < 0.001$) [19].

In another study, the same author evaluated patients who underwent laparoscopic surgery (PTE) and reported that 58% of the patients did not have anatomical structural changes in the inguinal region and 93% returned to sports within 30 days of surgery [20].

Although the pathophysiological understanding is not yet fully understood, patients undergoing surgery, the placement of a polypropylene surgical mesh fixed to the posterior wall by laparoscopy seems to provide sufficient support for the inguinal region, ensuring mechanical stabilization of the region, reducing local muscle pressure. Technically, placing the mesh in the pre-peritoneal region by laparoscopic approach seems to offer greater support compared to the open technique (inguinotomy) [20].

Conclusion

Diagnosing and treating hernia in sport efficiently requires careful clinical and radiological evaluation, requiring a multidisciplinary approach from an experienced team.

Responses to conservative treatment for inguinal pain are relatively low. Therapy for chronic inguinal pain that cannot be resolved after 6 months of conservative treatment can be referred for surgical treatment (laparoscopic or conventional) with acceptable pain treatment rates, with early return to sports activities in 4 - 8 weeks.

A better understanding of the pathophysiology of sport hernia could help to improve the clinical course of the pathology and decrease cases of recurrence or late complication. Prospective randomized studies focused on the results of surgical treatment could help to elucidate the effectiveness of surgical treatment.

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