

## Research

# Clinical Brief: Recognition and Treatment of the Elusive Sports Hernia

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## Abstract

Sports hernia is a chronic groin injury in athletes related to repetitive kicking, twisting, or turning at high speeds. A cluster of five signs and symptoms warrants investigation of sports hernia: (1) a complaint of deep groin/ lower abdominal pain, (2) pain exacerbated by sport-specific activities and relieved at rest, (3) palpable tenderness over the pubic ramus, (4) pain with resisted hip adduction, and (5) pain with resisted abdominal curl-up. The diagnosis is clinical in nature and it is appropriate that health care providers are well educated and knowledgeable in the clinical presentation, differential diagnosis, and management options when confronted with athletes suffering from groin pain. This article attempts to provide a thorough summary of involved anatomy, clinical diagnosis, imaging, manual therapy and surgical management.

## Introduction

Sports hernia, also known as athletic pubalgia, is an elusive condition that is commonly misunderstood by clinicians. Groin pain is common in sports that require athletes to perform repetitive kicking, twisting, or turning at high speeds, such as football, basketball, track and field, tennis, and most commonly soccer and hockey.<sup>1-5</sup> It is estimated that groin pain occurs in 5% to 28% of athletes.<sup>6</sup> Despite the prevalence of groin pain, the literature is filled with puzzling and often conflicting information regarding etiology, presentation, diagnosis, and treatment of groin pain in athletes.<sup>1,4</sup> The confusing presentation makes it all the more important that clinicians have a strong working knowledge of the condition, as sports hernia could easily be overlooked in the differential of groin pain.

The term *sports hernia* refers to chronic inguinal or pubic-area pain in athletes that is present with exertion only and not explainable preoperatively by a palpable hernia or other medical diagnosis.<sup>7</sup> The

inguinal pain in these athletes can be unilateral or bilateral, its specific location can change and it can be associated with medial thigh symptoms, most often related to the adductors of the hip.<sup>3</sup>

With sports hernias, there is disequilibrium between the upward and oblique pull of the abdominal muscles on the pubis against the downward and lateral pull of the adductors on the inferior pubis. This imbalance of forces can lead to injuries of the lower central abdominal muscles and the upper aponeurotic common insertion of the adductor muscles. **(Figure 1)** Although sports hernia is occasionally the result of an acute injury, it is more likely the result of repetitive eccentric overload to the abdominal wall stabilizers of the pelvis.<sup>8</sup>



**Figure 1.** Illustration depicts the abdominal muscles and the area which is affected by athletic pubalgia (sports hernia). As shown here, the tendons which attach the oblique muscles to the pubic bone are typically stretched or torn. Adductors of the femur which attach to the pubis (not shown) are also usually involved and are stretched or torn in a sports hernia. (Original anatomical illustration created by Frank Scali, D.C.)

## Clinical Diagnosis

A cluster of five signs and symptoms has been described as concurrent with presence of a sports hernia: (1) a complaint of deep groin/ lower abdominal pain, (2) pain that is exacerbated by sport-specific activities and relieved at rest, (3) palpable tenderness over the pubic ramus at insertion of rectus abdominis and/or conjoint tendon, (4) pain with resisted hip adduction, and (5) pain with resisted abdominal curl-up.<sup>1</sup> (**Table 1**)

**Table 1. Cluster of Symptoms for Sports Hernia<sup>1</sup>**

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- Complaint of deep groin/lower abdominal pain
  - Pain exacerbated by sport-specific activities
  - Palpable tenderness over the pubic ramus at rectus abdominis insertion
  - Pain with resisted hip adduction
  - Pain with resisted abdominal curl-up
- 

Sports hernia should be considered in patients who have a deep lower abdominal or groin pain, exacerbated with sport-specific activities, and relieved with rest.<sup>1,8</sup> It is a diagnosis of exclusion and a thorough differential diagnosis must first be used to rule out genitourinary, gynecological, visceral, hip/lumbar or other muscular sprain and strains.<sup>8</sup> (**Table 2**)

**Table 2. Differential Diagnosis<sup>20</sup>**

Category	Causes
Orthopedic	Adductor muscle strain, iliopsoas strain, avulsion fracture, stress fracture, osteitis pubis, intra-articular hip pathology (labral tear, loose body), hip degenerative disease, congenital anomalies of the hip (femoroacetabular impingement, developmental dysplasia), lumbar radiculopathy, nerve entrapment or irritation
General Surgery	Appendicitis, diverticulosis, adhesions, irritable bowel syndrome
Urologic	Urinary tract infection, prostatitis, testicular pain, varicoceles
Gynecologic	Round ligament entrapment, endometriosis, ovarian cyst

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After the other diagnoses have been ruled out the examination should begin with a standard hernia examination, followed by gentle percussion of the pubic symphysis to assess for osteitis pubis. The clinician should passively abduct the thigh to assess for adductor muscle spasm/tension. Next the patient should actively adduct the thigh against clinician resistance while adductor tenderness is assessed. Maintaining the forced adduction, the patient is then asked to perform a partial crunch, tightening the abdominal muscles. Pain provocation with resisted thigh adduction and/or abdominal curl-up would be consistent with a diagnosis of sports hernia.

## Imaging

The sports hernia is a clinical diagnosis, with no gold standard diagnostic test available; nonetheless, diagnostic imaging is important for several reasons.<sup>9</sup> Plain film x-rays, bone scans, computed tomography (CT), diagnostic ultrasound and especially magnetic resonance imaging (MRI) scans may be necessary to sort out related or associated injuries or pathology. Ultrasound would theoretically be well suited for diagnosis of this condition, but its accuracy is debatable, it is operator dependent, and its use is presently limited.<sup>10-14</sup> Many studies report that MRI has limited ability to diagnose a sports hernia and is only beneficial to rule out alternative diagnoses; however others have reported that clinical sports hernias almost always exhibit abnormalities on MRI.<sup>12-16</sup> The two dominant patterns of injury include lateral rectus abdominis/adductor aponeurotic injury just adjacent to the external inguinal ring and the midline rectus abdominis/adductor aponeurotic plate injury.<sup>8</sup> Although some degree of pubic marrow enhancement is commonly reported, these findings do not predict which patients will benefit from surgery.<sup>8</sup>

## Manual Therapy

If athletes have 4 or more months before they are scheduled to return to sport and recall hearing or feeling an acute lower abdominal “rip,” then they should be evaluated for surgical repair.<sup>1,8</sup> If not, then conservative treatment with manual therapy and rehabilitation is a suitable first option when treating an athlete with a suspected sports hernia.<sup>1</sup> A 6-week trial of conservative therapy should center around a multi-modal approach including soft tissue mobilization, joint manipulation, neuromuscular reeducation, stretching and trunk stabilization exercise.<sup>1,8</sup>

Soft tissue mobilization techniques are incorporated to address muscular tightness in the superficial posterior, superior, and lateral pelvic musculature and fascia with special attention directed at the thigh adductors. Joint mobilization and manipulation techniques directed at the pelvic and/or hip are recommended when hypomobility is present.<sup>1</sup> Several clinicians have reported success in treating groin injuries with a similar approach to care.<sup>1,17-19</sup>

Following a prolonged period of rest and rehabilitation, if these athletes are still bothered by the condition and unable to exercise, train, or compete satisfactorily, referral for surgical consult should be considered.

## Surgical Management

Surgical exploration and repair is indicated if nonoperative treatment fails and alternative diagnoses have been excluded.<sup>20</sup> There is no consensus in the literature regarding the preferred surgical repair technique.<sup>20</sup> The surgical techniques commonly applied are classified into 3 general categories: primary pelvic floor repair without mesh, open anterior mesh repair, and laparoscopic mesh repair.<sup>3,20-25</sup> Open repair of a sports hernia involves reattaching the rectus abdominis, conjoint tendon, and/or transversalis fascia to the pubis and inguinal ligaments, and is often reinforced with a polypropylene mesh.<sup>3,13,26-29</sup> The increasingly common laparoscopic procedure involves peritoneal insertion of a polypropylene mesh, resulting in less postoperative pain, smaller incisions, faster recovery rate, and has the additional advantage in that a diagnostic scope can be immediately followed by the repair.<sup>14,15,30</sup>

Early outcome studies utilizing laparoscopic repair indicate high success rates of return to preinjury level of play within 3 to 6 months.<sup>14,15,27,31-33</sup> Surgical outcomes for non-athletes have not been as favorable. Therefore, rehabilitation is currently advocated as the only course of action for non-athlete patients.<sup>1</sup>

## Conclusion

Sports hernia is an elusive condition that requires clinicians to have a thorough understanding of pelvic differential diagnosis and clinical presentation. It is a clinical diagnosis with imaging best utilized to rule out comorbidities and alternative diagnoses. A trial of manual therapy is recommended for most patients prior to surgical exploration. With manual treatments focused at decreasing hip/adductor muscle tension, restoring mobility to the hip, pelvic and lumbar joint where warranted and strengthening the hip and abdominal stabilizers. Surgical repair typically has positive outcomes and should be applied to athletes that do not respond to conservative measures, however it is not recommended for non-athletes.

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