Surgical Management of Sportsman’s Hernia in Professional Soccer Players

NOUREDIN MESSAOUDI, MD; CHRISTOPHE JANS, MD; STEVEN PAULI, MD; ROGER VAN RIEI, MD; GEERT DECLERCQ, MD; MARC VAN CLEEMPUT, MD

abstract

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Soccer players frequently experience acute and chronic groin pain. Sportsman’s hernia is a common injury in professional soccer players, that causes inguinal pain. The authors discuss their experience with the management of sportsman’s hernia in professional soccer players competing in national and international competition in a retrospective review of prospectively collected data. Between March 2004 and December 2009, seventy-one professional soccer players were surgically treated for sportsman’s hernia. Average age at surgery was 24 years, and average duration of symptoms from onset to surgical repair was 11 months. Conservative treatment improved symptoms temporarily or to some extent in 18 athletes. All athletes underwent a bilateral open hernia repair with concurrent adductor tendon release. Average follow-up was 4 years, and average time to return to competitive sport was 4 months. At final follow-up, 95% of soccer players were still active, 48 at the same level and 19 at a lower level. Four athletes had stopped their careers because of another injury (n=2) or recurrence (n=2).

Sportsman’s hernia is a potentially career-ending injury in professional soccer players. Conservative management is often unsuccessful. An open surgical hernia repair combined with an adductor longus tenotomy relieves the symptoms caused by a sportsman’s hernia and restores activity in 95% of athletes. This study offers insight into the management of sportsman’s hernia and offers a successful treatment to salvage the careers of professional soccer players.

Drs Messaoudi, Jans, Pauli, Van Riet, Declercq, and Van Cleemput are from the Department of General Surgery, and Drs Jans, Van Riet, and Declercq are from the Department of Orthopedic Surgery, Monica Hospital, Deurne, Belgium.

Drs Messaoudi, Jans, Pauli, Van Riet, Declercq, and Van Cleemput have no relevant financial relationships to disclose.

Correspondence should be addressed to: Nouredin Messaoudi, MD, Department of General Surgery, Monica Hospital, Florent Pauwelslei 1, BE-2100 Deurne, Belgium (nouredinmessaoudi@gmail.com). doi: 10.3928/01477447-20120822-24

Figure: Intraoperative photographs of the incision site of the hernia repair (A) and modified Bassini repair with 2/0 prolene double-layer running suture (B).
Groin injuries are common in soccer players. In general, soccer has a higher injury rate compared with other team sports, such as rugby, basketball, and football.1,2 Soccer players presenting with a sportsman’s hernia (athletic pubalgia) pose a complex management problem. A sportsman’s hernia is an obscure condition of uncertain etiology seen in athletes. The pain is often debilitating and may place a professional career at risk. Treatment failures are frustrating to athletes and physicians. The literature published to date regarding the cause, pathogenesis, diagnosis, and treatment of sports hernias is confusing.3 This article summarizes the current information and presents the authors’ clinical and surgical data regarding sportsman’s hernia in professional soccer players competing in national and international competitions.

**Materials and Methods**

**Patient Population**

The study was approved by the local medical ethics committee. Between March 2004 and December 2009, a diagnosis of a sportsman’s hernia was made in 71 soccer players. All were eventually treated by a surgical procedure at the authors’ institution. The athletes were mainly referred by sports clinics or club doctors. Demographic, operative, and follow-up data were obtained from a chart review from their final follow-up. In addition, all patients were contacted by phone and consented to complete a verbal questionnaire.

**Preoperative Evaluation**

Sportman’s hernia is a clinical diagnosis; therefore, correlating the history with the physical examination is important. Most athletes present with dull, chronic pain on their groin. The pain has a history of insidious onset and is intensified by running and sudden accelerations. Passing or kicking the ball may also elicit pain. Physical examination reveals point tenderness over the conjoint tendon or medial inguinal canal, distal rectus insertion, pubic tubercle, or adductor. Although Valsava maneuvers often worsen the pain, no hernia is palpated. Discomfort when palpating the groin during forceful resisted situps and hip adduction is often a classic finding. Hip range of motion tests with pain during FADIR (flexion, adduction, internal rotation) and FABER (flexion, abduction, external rotation) are performed to rule out coexisting hip pathology.

Radiology is necessary to rule out other causes of groin pain. Radiography may confirm osteoarthritis, fractures, or avulsions. Dynamic ultrasound can reveal a herniation at the level of the inguinal canal during Valsava maneuvers. Bone scan can show increased isotope uptake at the enthesis of the conjoint tendon or adductors. Magnetic resonance imaging is valuable for all musculoskeletal disorders around the hip joint, including stress fractures, avascular necrosis, osteomyelitis, tendinitis, and bursitis.

**Surgical Technique**

A general surgeon (S.P., M.V.C.) performed a modified Bassini repair, in which the transversal fascia from the deep to superficial ring was released. Intraoperatively, all athletes were found to have thinning and a variable degree of bulging of the posterior inguinal wall. The conjoint tendon was attached to the inguinal ligament in a double-layer continuous suture, in contrast with the interrupted original Bassini repair, with a running 2/0 prolene suture (Figure 1). A concurrent percutaneous adductor release was performed by an orthopedic surgeon (G.D.) in all cases. A bilateral tenotomy was conducted with complete transection of the epimysial fibers of the adductor longus tendon, 2 cm from the pubic insertion (Figure 2).

**Results**

Seventy-one professional soccer players were studied, all of whom competed in national and international leagues. All field positions were represented. Average age at surgery was 24 years (range, 16-38 years). All patients were men. Average duration of symptoms from onset to surgical repair was 11 months (range, 0-72 months). Various diagnostic imaging was
used to confirm the clinical diagnosis. Seventy-four percent of the soccer players underwent ultrasound, 65% underwent plain radiography, 60% underwent magnetic resonance imaging (MRI), and 18% underwent a bone scan. Radiologic data were necessary to exclude other diagnoses and complement the clinical examination. In this case series, a minority of patients presented with abnormal imaging results. Nonspecific findings that did not correlate with the localization of the pain during physical examination were reported as unexplained edema, musculotendinous asymmetry, and small muscle tears or avulsion fractures.

Conservative therapy consisted of nonsteroidal anti-inflammatory drugs (76%), local steroid infiltration (12%), and formal physiotherapy (83%). Eighteen (25%) patients had substantial but insufficient relief from conservative management. All soccer players underwent a bilateral open hernia repair with concurrent adductor tendon release.

Subjectively, all patients reported that surgery improved their symptoms. Follow-up ranged between 1 and 7 years. Average time to return to competitive sport was 4 months. At the time of questioning, 68% (n=48) of soccer players had returned to their preinjury level of competition, 27% (n=19) performed at a lower level, and 6% (n=4) had stopped playing soccer because of another injury (n=2) or recurrence (n=2) after resuming competitive sport activity (Table).

**Discussion**

Groin pain is one of the most common injuries occurring in professional soccer players. Ekstrand and Hilding\(^5\) reported a groin injury rate of 28% in these athletes, and an incidence of .8 groin injuries per 1000 hours of exposure to soccer has been reported. \(^5,7\) The etiology of groin pain is multivariate. The groin is a complex anatomical region, where the abdomen, pelvis, and lower limbs intersect. The differential diagnosis includes orthopedic, general surgical, urological, and gynecological causes. The current study focused on sportsman’s hernia, also referred to as athletic pubalgia, as the principal cause of groin injury.

Athletic pubalgia is a clinical syndrome that may elicit variable presentations but primarily includes refractory unilateral or bilateral groin pain, exacerbated by physical activity. Most athletes will have symptoms for months or years before a clinical diagnosis is made. The symptoms may progress to affect daily life. Soccer players may feel alternating episodes of exacerbation and improvement. Physical examination frequently reveals focal tenderness at the pubic attachment of the rectus abdominis, adductor longus muscle, or external inguinal ring. The pain is intensified with resisted hip adduction or sit-ups.

Most athletes with a diagnosis of sportsman’s hernia have a spectrum of related pathologic conditions resulting from musculotendinous injuries, with subsequent instability between the forces exerted through the muscles across the pubic symphysis. The pathogenesis of this condition is complex and poorly understood. However, a consensus exists that sportsman’s hernia is primarily characterized by weakness and bulging of the posterior inguinal wall without a clinically palpable hernia. \(^3\) This finding was confirmed in all patients in the current study.

Due to the variety in clinical presentation and pathophysiology, sportsman’s hernia in athletes presents a diagnostic challenge. Furthermore, the results of clinical diagnoses do not always correlate with radiological findings. Moreover, imaging studies will often be inconclusive; emphasizing the fact that athletic pubalgia is a clinical diagnosis. The use of herniography is outdated and is only mentioned for historical purposes. \(^8-10\) Plain radiographs can be useful in the differential diagnosis with pelvic bone abnormalities but will not show abnormality in a sportsman’s hernia. Ultrasonography is helpful to identify bulging of the posterior inguinal wall but does not definitively exclude tears or hernias. \(^11-14\) Moreover, the technique is operator dependent. Magnetic resonance imaging findings range from bulging of the posterior inguinal wall to adductor insertion abnormalities and symphysis. \(^15-19\) In addition, Zoga et al\(^20\) reported evidence of rectus abdominis tendon injury on MRI in two-thirds of patients presenting with a sportsman’s hernia. A bone scan may show increased uptake at the symptomatic pubic tubercle. \(^21\) Many studies show that surgical exploration is the only conclusive way to confirm the clinical diagnosis of a sportsman’s hernia when conservative measures are unsuccessful. \(^5,8,10,21,22\)

**Table**

<table>
<thead>
<tr>
<th>Variables</th>
<th>No. (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean age (range), y</td>
<td>24 (17-38)</td>
</tr>
<tr>
<td>Mean follow-up (range), y</td>
<td>4 (1-7)</td>
</tr>
<tr>
<td>Mean time to presentation (range), mo</td>
<td>11 (0-72)</td>
</tr>
<tr>
<td>Mean return to sport (range), mo</td>
<td>4 (0-20)</td>
</tr>
<tr>
<td>Imaging studies</td>
<td></td>
</tr>
<tr>
<td>Radiographs</td>
<td>46 (65)</td>
</tr>
<tr>
<td>Ultrasound</td>
<td>53 (75)</td>
</tr>
<tr>
<td>Bone scan</td>
<td>13 (18)</td>
</tr>
<tr>
<td>MRI</td>
<td>43 (61)</td>
</tr>
<tr>
<td>Conservative treatment</td>
<td></td>
</tr>
<tr>
<td>Physiotherapy</td>
<td>59 (83)</td>
</tr>
<tr>
<td>NSAIDs</td>
<td>54 (76)</td>
</tr>
<tr>
<td>Corticosteroid infiltration</td>
<td>21 (88)</td>
</tr>
<tr>
<td>Symptom improvement</td>
<td>18 (26)</td>
</tr>
<tr>
<td>Return to sport</td>
<td></td>
</tr>
<tr>
<td>Same level</td>
<td>48 (68)</td>
</tr>
<tr>
<td>Lower level</td>
<td>19 (27)</td>
</tr>
<tr>
<td>Career-ending recurrence</td>
<td>2 (3)</td>
</tr>
<tr>
<td>Career-ending other injury</td>
<td>2 (3)</td>
</tr>
<tr>
<td>Total</td>
<td>71 (100)</td>
</tr>
</tbody>
</table>

**Abbreviations:** MRI, magnetic resonance imaging; NSAIDs, nonsteroidal anti-inflammatory drugs.
In the current study, the conservative management of sportsman’s hernia resulted in limited symptom relief. Data from the study do not conclusively show that conservative treatment is not helpful because only surgical patients were considered. A regimen of restricted activity in combination with nonsteroidal anti-inflammatory drugs and physical therapy should be attempted for a short period before considering a surgical approach.22–25 Martens et al24 reported that one-third of patients with groin pain lasting more than 3 months could be cured by conservative treatment. Several reports suggest the initial use of a strengthening program for the adductor and abdominal muscles to increase pelvic stability.3,23,24 Less encouraging results are described for injection therapies.22,26,27 O’Connell et al27 investigated local corticoid infiltration therapy and reported limited symptom relief. Experimental injection of dextrose prolotherapy to promote tissue healing also led to disappointing results.28

In the current authors’ practice, surgical repair of a sportsman’s hernia is considered to increase the chances of an early return to sport activity. Numerous surgical approaches can be applied to repair the defect of the posterior abdominal wall. However, several studies reported associated intraoperative deficiencies in addition to weakening of the posterior inguinal wall.22,29–37 Concurrent injury to the aponeurosis of the musculus obliquus externus, defect of the rectus abdominis tendon insertion on the pubic symphysis, and deficiency of the tendon of the musculus adductor longus have been reported.22,29–37 Complex crossover likely exists with many or all of the preceding conditions, with chronic shear forces acting through the pubic symphysis via the adductor tendons, abdominal muscles, and medial inguinal structures. Coexistence of various pathologies resulted in the current authors’ decision to treat sportsman’s hernia by a surgical approach consisting of a modified Bassini hernia repair and concurrent percutaneous adductor tendon release to strengthen the abdominal wall and increase pelvic stability.

The combined surgical approach of releasing the adductor component and repairing the inguinal floor is endorsed by several authors.3,4,22,23,35,38 Meyers et al3,35 described a 95% success rate in high-performance athletes. Return to sport was achieved 3 to 6 months postoperatively. The authors believed that patients had stronger adductor muscles relative to the abdominal counterparts, which led to an imbalance of shear forces around the pubic symphysis.3,35 Martens et al22 reported that 20 of 22 patients returned to the same or a lower level of sport using a similar surgical technique, indicating the effectiveness of the procedure.

Recent advances in laparoscopic surgery in the management of sportsman’s hernia show promising results. In particular, the time to return to sport can be reduced to 1 to 3 months using a laparoscopic approach.10,13,39 Early return to sport is principally beneficial for professional athletes, whose careers may be endangered by prolonged competitive absence. However, the role of laparoscopic repair in the treatment of athletic pubalgia is debated. Due to the coexisting injuries associated with a sportsman’s hernia, laparoscopic mesh repair of the posterior inguinal wall alone is unlikely to relieve the athlete’s symptoms.3 A higher rate of operative reintervention, anecdotal complications, and the lack of randomized, controlled trials make it difficult to promote a laparoscopic approach as the golden standard in the treatment of a sportsman’s hernia.13,40–46

CONCLUSION

Sportsman’s hernia is a potentially career-ending injury in professional soccer players. Conservative treatment poorly alleviates symptoms. An open surgical hernia repair and a concurrent adductor tendon release generates excellent results in 95% of soccer players and offers a successful treatment to preserve the athletes’ careers.

REFERENCES


