Totally Extraperitoneal Endoscopic (TEP) Treatment of Sportsman's Hernia

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Abstract: Sportsman's hernia is a term used to describe a weakness or disruption of is a term used to describe the musculotendinous part of the posterior inguinal wall, which causes persistent groin pain in athletes. A video-assisted placement of extraperitoneal synthetic mesh to support the damaged area may heal this injury. Forty-one male athletes at an elite level (mean age 27 ± 7.1 years) with chronic groin pain, which was resistant to conservative therapy, were referred to surgery by sports clinics or club doctors. The majority of the patients were soccer (58%) or ice hockey players (27%) at a professional level. A 10 × 15 cm polypropylene mesh was placed into the preperitoneal space using a totally extraperitoneal video-assisted technique. The severity of pain, and the time to return to sports, were determined after 1 month and after the mean follow-up of 4 years. On operation, no macroscopic abnormality was found in 24 patients (58%), obvious musculotendinous tear was present in 10 patients, and muscle asymmetry was present in 7 patients. All except 2 patients (95%) returned to their sport activities after 1 month of convalescence. No immediate or long-term complications were associated with the operation. The placement of a retropubic mesh was safe and a mini-invasive method to repair sportsman's hernia and chronic groin pain of athletes.

Key Words: groin pain, pubalgia, inguinal hernia, sportsman's hernia, laparoscopy, herniorraphy

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G roin pain in sportsmen presents often a diagnostic challenge. It affects typically athletes in contact sports, such as ice hockey, soccer, and rugby.[1,2] Common causes include adductor or rectus abdominis tendoperiosteal enthesopathies, osteitis pubis, entrapment of inguinal nerves, or disruption of the posterior wall of the inguinal canal, ie, sportsman's hernia.[3–5] Sometimes a multidisciplinary investigation may reveal more than one obvious reason for groin pain.[6] A native x-ray, isotope bone scan, ultrasound (US), magnetic resonance imaging (MRI), and herniography sometimes help to detect the exact cause of pain.[5,7–9] Often, however, imaging studies are negative, and the only clinical sign is deep palpation pain lo-

cated near the pubic tubercle. In these cases, various pubic enthesopathies (insertitis, tendoperiostitis) or sportsman's hernia can be suspected.[4,5,10]

The treatment of chronic groin pain is always aimed toward its specific pathology. First-line management includes muscle strengthening and stretching exercises, physiotherapy, anti-inflammatory analgesics, local anesthetic, corticosteroid injections, and—in resistant cases—surgery.[1,5] Various operative approaches for groin pain in athletes have been proposed depending on the suspected nature of injury. These include diverse methods of hernia repair,[2,5,11] tenotomies of muscle tendons close to the pubic bone,[4,12] as well as releasing or transecting of nearby nerves.[1,13] The results of any operative treatment are good or excellent in 60% to 80% of the cases, but they require long postoperative healing.[5] In this communication, we present a novel surgical method for pubic enthesopathy, ie, a video-assisted preperitoneal insertioplasty with a polypropylene mesh.

PATIENTS AND METHODS

Patients

Male elite level athletes (n = 41, mean age 27 ± 7.1 years) represented different sports as summarized in Table 1. The operations were carried out in Deaconess Foundation Hospital (Diacor), Helsinki, Finland (n = 31), and in Mikkeli Central Hospital, Finland (n = 10) during the years of 1996–2002. Most athletes were elite level soccer or ice hockey players in Finnish national leagues. The patients were referred to surgery from sports clinics and club doctors after failure of conservative treatment. All patients had been treated using various nonoperative attempts of treatment, including rest, steroid injections, and physical therapy. Conventional Bassini herniorraphy at the same side had been earlier performed with 3 patients. The patients had a history of an acute or overuse injury in the groin conjoined with persistent pain that worsened in physical activities. The patients had been totally disabled from their professional sport (n = 24) or had remarkable limitation (n = 17) in training and competing.

Preoperative Evaluation

During the course of their injury, pelvic roentgenograms of the groin region were obtained in all patients to rule out

TABLE 1. The Characteristics and Imaging Findings of 41 Elite Level Athletes With Sportman's Hernia

Mean age (± SD)	27 ± 7.1 years
Mean duration of symptoms (months, ± SD)	9.2 ± 9.1
Side	
Right	29 (70%)
Left	8 (20%)
Bilateral	4 (10%)
Type of sport	
Soccer	24 (58%)
Ice hockey	11 (27%)
Miscellaneous	6 (15%)
Imaging positive	
Ultrasound	6/7
MRI	5/9
Bone scanning	7/13
CT	1/1

stress fracture. Ultrasound, MRI, or CT scans were performed in the selected cases (Table 1). A typical history associated with deep palpation pain at pubic tubercle was considered diagnostic if other causes of groin pain were clinically or radiologically excluded. All patients were informed that the operative method was experimental, and conventional surgery was offered as an option.

Operative Technique

All operations were performed by 2 senior consultants in laparoscopic surgery (IA, HP). A standard 3-trocar technique of a video-assisted preperitoneal hernia repair was used.[14,15] A 10-mm trocar with a cuff (OMS-T10BT 10 mm Blunt Tip Trocar and syringe; Tyco Healthcare, USA) was placed into the preperitoneal space via blunt dissection. Then a pneumatic dilatator (OMS-PDB 2, Tyco Healthcare) was used to open the preperitoneal space. Two 5-mm trocars (Reusable Lina Port 5-mm short, Nikomed, USA) were then placed through lower abdominal muscles bilaterally under visual control (45° Hopkins 2 optic, Karl Storz, Germany). A traumatic dissection was extended bilaterally from symphysis to the level of inferior epigastric vessels and caudally behind symphysis as far as possible. This dissection gave a good view to pubic tubercle, insertions of conjoined tendons, and rectus muscles, and it ruled out a medial (direct) inguinal hernia. Dissection was not extended more laterally because no lateral inguinal hernia was suspected, and any trauma to spermatic cord and vessels was tried to be avoided. We did not dissect the spermatic cord to free it from the surrounding structures, nor did we try to identify lipomas within the spermatic cord. The lateral inguinal hernia was clinically excluded by performing a palpation of the superficial inguinal ring and a cough test. After the dissection, the insertion area was covered with a 10 × 15 cm polypropyl-

ene mesh (Premilene; Braun, Germany; or Prolene, Ethicon, USA) which was fixed with 6 to 10 staples anteriorly into the transversalis fascia (Protack stabler, Tyco Healthcare) and/or tissue glue (Glubran 2, surgical glue, Karl Beus, Germany). The mesh was placed bilaterally even when the symptoms were unilateral, because scarring of the preperitoneal space would most likely prevent a later operation of the nonaffected side. After the placement of the mesh, 5-mm trocars were removed under visual control, the air was released from the space, and the 10-mm trocar was removed. The wounds were closed with intracutaneous absorbable sutures. Two patients had simultaneous insertion tendinitis of the adductor magnus, and an open tenotomy[12] was performed during the same anesthesia.

Postoperative Evaluation

The operations were performed mainly on day-case surgery (n = 31) or the patients spent overnight in the hospital (n = 10). Conventional NSAID drugs or paracetamol were used for the postoperative pain relief. Training with full activity was initiated immediately when the pain allowed. All patients were evaluated after 4 weeks either by the operating unit or by the club sport physicians. Postoperative recovery was evaluated asking for operative complications, postoperative pain, use of analgesics and time to resuming low level training, full training, and competing. In addition, long-term results were registered with a telephone questionnaire in January 2003 (mean follow-up 4.2 ± 1.8 years).

RESULTS

Although most athletes (particularly soccer players) had groin pain at the side of their right dominant foot, bilateral pain was also present in 10% (Table 1). Over half of the patients presented with no macroscopic pathology at the operation (Table 2). In 10 patients, a clear rupture of the conjoined tendon near the pubic ramus was observed, which had no correlation with preoperative radiologic findings or any degree of

TABLE 2. Operative Findings and Return to Sport Activities

Operative finding	
No abnormality	24 (58%)
Muscle tear	10 (24%)
Asymmetry	7 (17%)
Immediate outcome (1 month)	
Excellent	38 (93%)
Partial	2 (5%)
No help	1 (2%)
Long-term outcome (mean follow-up 51 ± 22 months)	
Painless	39 (95%)
Symptoms in training	2 (5%)

preoperative symptoms. No real inguinal hernias were observed in this study.

All patients were discharged within 24 hours after the operation, and none of the patients were readmitted to hospital because of any postoperative complications. No infection complications were detected at the follow-up. The recovery period was short, relatively painless, and full sporting activity was resumed by in the majority of the patients (>90%) after 4 weeks of convalescence (Table 2). One ice hockey player was disabled for 4 months after he participated (too soon after treatment) in a European Hockey League match (4 days after the operation).

All but 2 patients benefitted from the operation. One soccer player was forced to end his career after the final diagnosis was enhanced anteversion and incipient arthrosis of his hip joints. The other patient had urinary tract symptoms both pre- and postoperatively (mainly urinary voiding). None of the patients required reoperation, steroid injections, or specific physical therapy after the operation because of recurrent groin pain. One patient with the pain radiating to the femoral adductor region was reoperated later (adductor tenotomy).

DISCUSSION

In the present preliminary communication, we describe a video-assisted preperitoneal insertioplasty in the treatment of chronic groin pain. Our results demonstrate that this method allows excellent immediate and long-term relief of chronic groin pain with low morbidity, and fast recovery to full sport activities. We believe that a tension-free mesh placed posteriorly to the inguinal wall and pubic tubercle gives firm support to disruptured conjoint tendon. The large mesh shares properly muscle pressure of this vulnerable area in heavy training athletes. The preoperative balloon dilatation may also cause some neurolysis and an enhanced scar tissue of the painful area.

About 5% of the patients attending sport clinics have chronic groin pain.[5] First-line treatment is always conservative.[1,10] Before mesh insertioplasty, it is imperative to exclude many other common causes of groin pain, which are treated nonoperatively.[1] The diagnostic imaging modalities for chronic groin pain include herniography,[8] ultrasound,[9] computerized tomography, isotope bone scan, and MRI.[5,7,16] Herniography may be sensitive to find out small incipient hernias, but its specificity with groin pain is poor.[5,8] Ultrasound and MRI[9,16] are more promising, which can be seen in our results (Table 1). In the majority of the cases, only pain on palpation in the posterior wall may occur, but no other physical or imaging signs are positive. The operative findings in a sportsman's hernia are minimal, such as small hematoma, edema, weak or a deficient posterior wall, or bulge.[5] The condition has been previously distinguished from the osteitis pubis. We think that a defect in conjoint tendon,[4] enthesopathy of inguinal ligaments,[10] and osteitis pubis in some cases[17] may be manifestations of the same disease entity, ie, repetitive stress or acute

disrupture of musculotendinous complex attached to the pubic tubercle. Recent studies on bone edema in MRI demonstrate that osteitis pubis, stress fracture, and insertion tendinitis may actually be the diverse symptoms of the same overuse injury.[7,16]

A sportman's hernia may be bilateral in 8% to 32% of the cases.[5] After Bassini or other conventional herniorraphy, only 60% to 90% considered themselves completely cured and had returned to a competitive sport.[5] Laparoscopic repair of groin disruption in sportsmen was effective and less painful than conventional repair in 14 patients who underwent a transperitoneal mesh operation.[11] Video-assisted repair of groin disruption particularly in athletes has many theoretical advantages. The posterior position of the mesh behind the conjoint tendon and pubic bone theoretically create a stronger support than conventional anterior herniorraphy. Furthermore, preperitoneal technique is less traumatic than an intra-abdominal or an open technique. The postoperative pain and wound complications are less frequent than in open surgery. In soccer players, the most common differential diagnosis is enthesopathy of adductor longus tendon. The diagnosis is confirmed by tenderness at the site of the insertion. The symptoms are resolved usually at rest or by injection of bupivacaine and a long-acting steroid. When conservative treatment fails, tenotomy of the adductor longus tendon gives good long-term functional results.[12]

Chronic overuse injuries of the lower abdomen are particularly common in hockey players. In the differential diagnosis, a "hockey groin syndrome" was recently described by Lacroix and others.[18,19] This injury includes a tearing of the external oblique aponeurosis associated with ilioinguinal nerve entrapment. The operative management consisted of an open ablation of the ilioinguinal nerve and the reinforcement of the external oblique aponeurosis with a Goretex mesh or sutures.[18,19] It is presently unknown whether this overuse injury is specific only to hockey players. The anatomic site of the "hockey groin syndrome" is more the anterior wall of the inguinal canal compared with sportman's hernia, which causes a disruption of the posterior inguinal canal.

In summary, once the diagnosis of sportsman's hernia is confirmed and conservative treatment fails, video-assisted preperitoneal insertioplasty is a promising novel method in competitive athletes. Our results demonstrate that this technique allows an excellent relief of groin pain, with low morbidity and fast recovery to full-sporting activities.

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