Surgery for Groin Pain in Athletes

DISCLAIMER

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POLICY

Surgical treatment of groin pain in athletes (also known as athletic pubalgia, Gilmore groin, osteitis pubis, pubic inguinal pain syndrome, inguinal disruption, slap shot gut, sportsmen groin, footballers groin injury complex, hockey groin syndrome, athletic hernia, sports hernia, or core muscle injury) is considered investigational.

POLICY GUIDELINES

There is no specific code for surgical treatment of groin pain in athletes. The following unlisted CPT codes may be used:

- 27299 unlisted procedure, pelvis or hip joint
- 49659 unlisted laparoscopy procedure, hernioplasty, herniorrhaphy, herniotomy
- 49999 unlisted procedure, abdomen, peritoneum and omentum.

BENEFIT APPLICATION

BLUECARD/NATIONAL ACCOUNT ISSUES

None.

BACKGROUND

GROIN PAIN IN ATHLETES

Groin pain in athletes is a poorly defined condition for which there is no consensus on cause and/or treatment. Alternative names include Gilmore groin, osteitis pubis, pubic inguinal pain syndrome, inguinal disruption, slap shot gut, sportsmen groin, footballers groin injury complex, hockey groin syndrome, athletic hernia, sports hernia, and core muscle injury.
Some believe the groin pain is an occult hernia process, a prehernia condition, or an incipient hernia, with the major abnormality being a defect in the transversalis fascia, which forms the posterior wall of the inguinal canal. Another theory is that injury to soft tissues that attach to or cross the pubic symphysis is the primary abnormality. The most common of these injuries are thought to be at the insertion of the rectus abdominis onto the pubis, with either primary or secondary pain arising from the adductor insertion sites onto the pubis. It has been proposed that muscle injury leads to failure of the transversalis fascia, with a resultant formation of a bulge in the posterior wall of the inguinal canal.\(^1\)

Osteitis pubis (inflammation of the pubic tubercle) and nerve irritation/entrapment of the ilioinguinal, iliohypogastric, and genitofemoral nerves are also believed to be sources of chronic groin pain. A 2015 consensus agreement has recommended the more general term *groin pain in athletes*, with specific diagnoses of adductor-related, iliopsoas-related, inguinal-related, and pubic-related groin pain.\(^2\)

An association between femoroacetabular impingement (FAI) and groin pain in athletes has been proposed (see evidence review 7.01.118). It is believed that if FAI presents with limitations in hip range of motion, compensatory patterns during athletic activity may lead to increased stresses involving the abdominal obliques, distal rectus abdominis, pubic symphysis, and adductor musculature. A 2015 systematic review of 24 studies that examined the co-occurrence of FAI and groin pain in athletes found an overlap of the 2 conditions that ranged from 27% of hockey players to 90% of collegiate football players who presented with hip and groin pain.\(^3\) Surgery for sports-related groin pain has been performed concurrently with treatment of FAI or following FAI surgery if symptoms did not resolve.

**Diagnosis**

A diagnosis of groin pain in athletes is based primarily on history, physical exam, and imaging. The clinical presentation will generally be a gradual onset of progressive groin pain associated with the activity. A physical exam will not reveal any evidence for a standard inguinal hernia or groin muscle strain. Imaging with magnetic resonance imaging or ultrasound is generally done as part of the workup. In addition to the exclusion of other sources of lower abdominal and groin pain (eg, stress fractures, FAI, labral tears), imaging may identify injury to the soft tissues of the groin and abdominal wall.\(^4\)

**Treatment**

*Conservative*

Many injuries will heal with conservative treatment, which includes rest, icing, nonsteroidal anti-inflammatory drugs, and rehabilitation exercises. A physical therapy (PT) program that focuses on strength and coordination of core muscles acting on the pelvis may improve recovery. In a 1999 study, 68 athletes with chronic adductor-related groin pain were randomized to 8 to 12 weeks of an active training PT program that focused on strength and coordination of core muscles, particularly adductors, or to standard PT without active training.\(^5\) At 4 months posttreatment, 68% of patients in the active training group had returned to sports without groin pain compared with 12% in the standard PT group. At 8- to 12- year follow-up, 50% of athletes in the active training group rated their outcomes as excellent compared with 22% in the standard PT group.\(^6\) For in-season professional athletes, injections of corticosteroid or platelet-rich plasma (see evidence review 2.01.16), or a short corticosteroid burst with taper have also been used.

*Surgical*

Surgical treatment is typically reserved for patients who have failed at least 3 months of conservative treatment. One approach consists of open or laparoscopic sutured hernia repair with mesh reinforcement of the posterior wall of the inguinal canal. Laparoscopic procedures may use either a transabdominal preperitoneal or an extraperitoneal approach. A variety of musculotendinous defects,
nerve entrapments, and inflammatory conditions have been observed with surgical exploration. Meyers et al (2008) have proposed that any of the 17 soft tissues that attach or cross the pubic symphysis can be involved, leading to as many as 26 surgical procedures and 121 different combinations of procedures that address the various core muscle injuries.\(^7\) The objective is to stabilize the pubic joint by tightening or broadening the attachments of various structures to the pubic symphysis and/or by loosening the attachments or other supporting structures via epimysiotomy or detachment.

Because various surgical procedures used to treat sports-related groin pain have reported success, it has been proposed that general fibrosis from any surgery may act to stabilize the anterior pelvis and thus play a role in improved surgical outcomes.

**REGULATORY STATUS**

Treatment of sports-related groin pain is a surgical procedure and, as such, is not subject to regulation by the U.S. Food and Drug Administration.

**RATIONALE**

This evidence review was created in July 2014 and has been updated regularly with searches of the MEDLINE database. The most recent literature update was performed through December 11, 2017.

Evidence reviews assess the clinical evidence to determine whether the use of a technology improves the net health outcome. Broadly defined, health outcomes are length of life, quality of life, and ability to function—including benefits and harms. Every clinical condition has specific outcomes that are important to patients and to managing the course of that condition. Validated outcome measures are necessary to ascertain whether a condition improves or worsens; and whether the magnitude of that change is clinically significant. The net health outcome is a balance of benefits and harms.

To assess whether the evidence is sufficient to draw conclusions about the net health outcome of a technology, 2 domains are examined: the relevance and the quality and credibility. To be relevant, studies must represent one or more intended clinical use of the technology in the intended population and compare an effective and appropriate alternative at a comparable intensity. For some conditions, the alternative will be supportive care or surveillance. The quality and credibility of the evidence depend on study design and conduct, minimizing bias and confounding that can generate incorrect findings. The randomized controlled trial (RCT) is preferred to assess efficacy; however, in some circumstances, nonrandomized studies may be adequate. RCTs are rarely large enough or long enough to capture less common adverse events and long-term effects. Other types of studies can be used for these purposes and to assess generalizability to broader clinical populations and settings of clinical practice.

Sports-related groin pain has a variable natural history, with an uncertain time course of the disorder. Also, pain and functional ability are subjective outcomes and, thus, may be particularly susceptible to placebo effects. Because of these factors, controlled trials are essential to demonstrate the clinical effectiveness of surgical treatment of athletic pubalgia compared with alternatives such as continued medical management.

In 2015, a consensus report call the Doha agreement recommended the use of specific diagnoses of adductor-related, iliopsoas-related, inguinal-related, or pubic-related groin pain in place of athletic pubalgia or sportsman’s hernia.\(^2\) However, these terms have yet to be routinely used in the published literature. Because it is not possible to determine which patient subgroups were studied, the terminology from the published reports is used. The only validated patient-reported outcome measure for pain and dysfunction in the groin area in young and middle-aged patients that were identified in the Doha report is the Copenhagen Hip and Groin Outcome Score.\(^8\)
MESH REINFORCEMENT

Randomized Controlled Trials
Paajanen et al (2011) reported on a multicenter RCT comparing surgical treatment with conservative therapy in 60 athletes who had suspected sports hernia. Of the 60 (including 31 national-level soccer players), 36 (60%) were totally disabled from their sport and 24 (40%) had a marked limitation in training and competing. For inclusion in the trial, the location of pain had to be rostral to the inguinal ligament in the deep inguinal ring at palpation or the insertion point of the adductor tendons. Exclusion criteria were isolated tendinitis of the adductor muscles or tendons without groin pain rostral to the inguinal ligament, obvious inguinal hernias, or suspicion of inguinal nerve entrapment. Participants had to have the desire to continue sports at the same level as before the groin injury. Pubic bone marrow edema was identified by magnetic resonance imaging (MRI) in 58% of patients. For participants (38%) who had a normal MRI in the pubic area, the pain was attributed to the insufficiency of the posterior wall of the inguinal canal. After at least 3 months of groin symptoms, patients were randomized to surgical or conservative treatment groups. Conservative treatment included at least 2 months of active physical therapy that focused on improving coordination and strength of core muscles, along with corticosteroid injections and oral anti-inflammatory analgesics. Surgical treatment consisted of laparoscopic total extraperitoneal repair with mesh placed behind the pubic bone and/or posterior wall of the inguinal canal. Ten percent of the patients also underwent open tenotomy of the adductor magnus or longus. Of the 30 surgically treated athletes, 27 (90%) returned to sports activities by 3 months compared with 8 (27%) of the nonoperative group. At 1, 3, 6, and 12 months after treatment, visual analog scale (VAS) scores for pain were significantly lower in the surgically treated group (<0.001). At 12 months, mean VAS scores for pain were less than 2 in both groups. However, among the 30 patients assigned to the conservative treatment group, 7 (23%) crossed over to surgery after 6 months with successful return to sport, 4 (13%) discontinued their sport of choice, and 16 (53%) were left with disabling symptoms after 12 months but chose not to undergo surgery.

A RCT by Ekstrand and Ringborg (2001) randomized 66 male soccer players to hernioplasty plus neurotomy (n=17), physical therapy (n=14), strength training of abdominal muscles (n=18), or a no treatment control (n=17). All patients had an incipient hernia determined by herniography and/or positive nerve block test of the ilioinguinal or iliohypogastric nerves. VAS scores for pain were assessed at 3 and 6 months during coughing, sit-ups, jogging, kicking, and sprinting. VAS scores for pain in the control, physical therapy, and training groups were generally unchanged at 3 and 6 months, although results were analyzed using nonparametric tests instead of the more appropriate repeated-measures or mixed-effects analysis. VAS scores improved significantly more for the surgery group than for the 3 other groups (<0.01). Strengths of this study included the active comparison groups and careful selection of patients. However, results are difficult to interpret due to the combined surgical procedure of hernioplasty plus neurotomy.

Observational Studies
Nonrandomized comparative and uncontrolled studies can sometimes provide useful information on health outcomes but are prone to biases such as noncomparability of treatment groups, the placebo effect, and variable natural history of the condition. A number of observational series have reported on surgical outcomes. However, these studies enrolled variable patient populations and used different surgical techniques. All studies reported that a high percentage of patients returned to full sports activities, but there were no control groups for comparison.

Kopelman et al (2016) reported on a prospective series of 246 male patients with chronic groin pain. All patients underwent an ultrasound, and 98 also underwent an MRI. Of the 246 patients, 209
underwent conservative treatment with rest and nonsteroidal anti-inflammatory drugs, after which 51 (21%) of 246 underwent inguinal surgery. Another 37 (15%) patients were diagnosed by imaging with noninguinal pathologies such as inflammation of the pubic bone and symphysis pubis, rectus abdominis muscles, and hip joint pathologies. Of the 51 who underwent surgery (mesh repair, oblique aponeurosis release, neurolysis), a direct or an indirect hernia was observed in 18 (35%) patients. In the remainder (65%), no abnormalities were found. There were 2 surgical failures, and all other patients returned to full sports activity within 4.3 weeks. In this series, most patients did not require surgery, and the authors commented that pubic and suprapubic symptomatology should be differentiated from inguinal and adductor complaints.

Section Summary: Mesh Reinforcement
The evidence on mesh reinforcement for inguinal-related groin pain includes 2 RCTs and a large prospective series. Results of the RCTs have suggested that, in carefully selected patients, mesh reinforcement results in an earlier return to play. However, a 2016 large prospective series indicated that only about 20% of patients with chronic groin pain benefit from inguinal surgery. Selection of patients in this series excluded patients with noninguinal pathology and failure of a conservative treatment trial of complete rest and nonsteroidal anti-inflammatory drugs. Further study is needed to corroborate these results and to define the patient population that would benefit from this treatment approach.

SURGICAL REPAIR OR RELEASE OF SOFT TISSUE
Observational Studies
There is more limited literature on the repair or release of soft tissue. An example of a large case series is a retrospective review by Meyers et al (2008) that reported on the surgical treatment of 5218 patients diagnosed with athletic pubalgia over the prior 2 decades. Initially, diagnoses were made by history and physical examination, with MRI used in the more recent years. Referrals increased from 3 per week in 1987 to 25 per week in 2008. Patients treated with surgery ranged from 11 to 71 years of age; women comprised about 8% of the group. The surgeries involved 26 different procedures of reattachments and/or releases of soft tissues that normally attach or cross the pubic symphysis. The authors reported that 95.3% of the patients returned to full play within 3 months of surgery. For a subgroup of athletes treated in-season, 90% were able to return to full play within 3 weeks. Adverse surgery-related events included dysesthesias (0.3%), significant hematomas (0.3%), and vein thrombosis (0.1%), all of which resolved within 1 year.

Section Summary: Surgical Repair or Release of Soft Tissue
An alternative approach to the treatment of groin pain in athletes has been reported in a large series. This retrospective study included a review of medical records spanning 2 decades and over 5000 cases. There was no information on prior conservative treatments. More recent reports on these procedures from other institutions are lacking.

SUMMARY OF EVIDENCE
For individuals who have sports-related groin pain who receive mesh reinforcement or who receive surgical repair and release of soft tissue, the evidence includes 2 RCTs and a number of case series. Relevant outcomes are symptoms, functional outcomes, and treatment-related morbidity. The evidence on mesh reinforcement for inguinal-related groin pain includes 2 RCTs and a large prospective series. Results of the RCTs have suggested that, in carefully selected patients, mesh reinforcement results in an earlier return to play. However, a large prospective series from 2016 indicated that only about 20% of patients with chronic groin pain benefit from inguinal surgery. Further study is needed to define the
patient population that would benefit from this treatment approach. An alternative approach to the
treatment of groin pain in athletes involves repair or release of soft tissue. This approach has been
reported in a large series. It included a 2008 review of medical records spanning 2 decades and over
5000 cases. More recent reports on these procedures from other institutions are needed. The evidence
is insufficient to determine the effects of the technology on health outcomes.

SUPPLEMENTAL INFORMATION

PRACTICE GUIDELINES AND POSITION STATEMENTS
The American Academy of Orthopaedic Surgeons has an online educational website, last reviewed in
2017, on sports hernia (athletic pubalgia). The Academy indicated that a sports hernia is a painful soft
tissue injury that occurs in the groin area. The Academy advised that “In many cases, 4 to 6 weeks of
physical therapy will resolve any pain and allow an athlete to return to sports. If, however, the pain
comes back when you resume sports activities, you may need to consider surgery to repair the torn
tissues.”

British Hernia Society
The British Hernia Society published a 2014 position statement on the treatment of sportsman’s groin. Based on a consensus conference, the term inguinal disruption was agreed to be the preferred
nomenclature because no true hernia exists. Participants agreed that there was abnormal tension in the
groin, particularly around the inguinal ligament attachment and that other findings may include the
possibility of external oblique disruption with consequent small tears. It was noted that other
pathologies also account for symptoms of groin pain, including adductor muscle tendonitis, osteitis
pubis, and pubic symphysitis. A multidisciplinary approach with tailored physical therapy was
recommended as an initial treatment, with surgery involving releasing the tension in the inguinal canal
and reinforcing it with a mesh or suture repair.

U.S. PREVENTIVE SERVICES TASK FORCE RECOMMENDATIONS
Not applicable.

MEDICARE NATIONAL COVERAGE
There is no national coverage determination. In the absence of a national coverage determination,
coverage decisions are left to the discretion of local Medicare carriers.

ONGOING AND UNPUBLISHED CLINICAL TRIALS
Some currently unpublished trials that might influence this review are listed in Table 1.

Table 1. Summary of Key Trials

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<td>NCT01876342</td>
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<td>NCT00934388</td>
<td>A Randomised, Blinded Study on Laparoscopic Mesh</td>
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Surgery for Groin Pain in Athletes

Reinforcement for Chronic Groin Pain

NCT: national clinical trial.

REFERENCES


**CODES**

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**POLICY HISTORY**

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references added. Policy statement unchanged.

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