Surgery for Groin Pain in Athletes

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**Replaces**: N/A

Policy

Surgical treatment of groin pain in athletes (also known as 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**.

Related Policies

None

Policy Guidelines

Coding

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Description

Sports-related groin pain, commonly known as athletic pubalgia or sports hernia, is characterized by disabling activity-dependent lower abdominal and groin pain not attributable to any other cause. Athletic pubalgia is most frequently diagnosed in high-performance male athletes, particularly those who participate in sports that involve rapid twisting and turning such as soccer, hockey, and football. For patients who fail conservative therapy, surgical repair of any defects identified in the muscles, tendons, or nerves has been proposed.
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.(1) 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 is 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 also been proposed. 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 systematic review of 24 studies that examined the co-occurrence of FAI and athletic pubalgia 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 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 one of gradual onset of progressive groin pain associated with activity. 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 exclusion of other sources of lower abdominal and groin pain (eg stress fractures, femoroacetabular impingement, labral tears), imaging may identify injury to the soft tissues of the groin and abdominal wall.(4)

**Conservative Treatment**

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 program (PT) that focused on strength and coordination of core muscles, particularly adductors (PT+), or to standard PT without active training (PT–).(5) At 4 months after treatment, 68% of patients in the active training group had returned to sports without groin pain compared with 12% in the PT– group. At 8- to 12- year follow-up, 50% of athletes in the active training group rated their outcome as excellent compared with 22% in the PT– group.(6) For in-season professional athletes, injections of corticosteroid or platelet-rich plasma, or a short corticosteroid burst with taper have also been used.

**Surgical Treatment**

Surgical treatment is typically reserved for patients who have failed at least 3 months of conservative treatment. One approach consists of either 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 a totally extraperitoneal approach. A variety of musculotendinous defects, nerve entrapments, and inflammatory conditions have been observed with surgical exploration. Meyers proposes 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 of this approach is to stabilize the pubic joint by tightening or broadening the attachments of various structures to the
pubic symphysis and/or loosening the attachments or other supporting structures via epimysiotomy or detachment.

Because there are a variety of surgical procedures used to treat sports-related groin pain that have all reported success, it has been proposed that general fibrosis from any type of 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.

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**Scope**

Medical policies are systematically developed guidelines that serve as a resource for Company staff when determining coverage for specific medical procedures, drugs or devices. Coverage for medical services is subject to the limits and conditions of the member benefit plan. Members and their providers should consult the member benefit booklet or contact a customer service representative to determine whether there are any benefit limitations applicable to this service or supply. This medical policy does not apply to Medicare Advantage.

**Benefit Application**

N/A

**Rationale**

This policy was created in July 2014 with subsequent literature searches using the MEDLINE database. The most recent literature update was performed through December 21, 2016.

Sports-related groin pain has a variable natural history, with an uncertain time course of the disorder. In addition, 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. Randomized trials are also important because there may be numerous confounders of outcomes, and nonrandomized comparisons are prone to selection bias. Therefore, evidence evaluated for this review has focused on randomized controlled trials (RCTs) and other controlled trials.

In 2015, a consensus report call the Doha agreement recommended 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 will be used. The only validated patient-reported outcome measure for pain and dysfunction in the groin area in young and middle-aged patients that was identified in the Doha report is the Copenhagen Hip and Groin Outcome Score. (8)

**Mesh Reinforcement**

*Randomized Controlled Trials*
In 2011, Paajanen et al reported on a multicenter RCT comparing surgical treatment and 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 at 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, pain was attributed to insufficiency of the posterior wall of the inguinal canal. After at least 3 months of groin symptoms, patients were randomized to surgical or to conservative treatment groups. Conservative treatment included at least 2 months of active physical therapy (PT) 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 (p<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 2001 RCT by Ekstrand and Ringborg randomized 66 male soccer players to hernioplasty plus neurotomy (n=17), PT (n=14), strength training of abdominal muscles (n=18), or to 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 (p<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.

In 2016, Kopelman et al reported on a prospective series of 246 male patients with chronic groin pain. All patients underwent ultrasound, and 98 also underwent MRI. Of the 246 patients, 209 underwent conservative treatment with rest and non-steroidal anti-inflammatory drugs (NSAIDs), after which 51 (21%) of 246 underwent inguinal surgery. Another 37 (15%) patients were diagnosed by imaging with non-inguinal pathology 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 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
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 NSAIDs. 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. (7) 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**

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 have surgical repair and release of soft tissue, the evidence includes 2 randomized controlled trials (RCT), 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 has 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 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.

**Ongoing and Unpublished Clinical Trials**

Some currently unpublished trials that might influence this policy are listed in Table 1.

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NCT: national clinical trial.
Practice Guidelines and Position Statements

**American Academy of Orthopaedic Surgeons**
The American Academy of Orthopaedic Surgeons (AAOS) posted an online educational document in 2010 on Sports Hernia (Athletic Pubalgia).(17) AAOS advises 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.(18) Based on a consensus conference, the term "inguinal disruption" was agreed as the preferred nomenclature as 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 tendinitis, osteitis pubis, and pubic symphysitis. A multidisciplinary approach with tailored physiotherapy was recommended as initial treatment, with surgery involving releasing the tension in the inguinal canal and reinforcing it with a mesh or suture repair.

**U.S. Preventative Services Task Force Recommendations**
Not applicable.

**Medicare National Coverage**
There is no national coverage determination (NCD). In the absence of an NCD, coverage decisions are left to the discretion of local Medicare carriers.

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**References**


Appendix

N/A

History

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<td>Annual Review, changes approved April 12, 2016. Policy updated with literature review through December 13, 2015; reference 2 added. Policy statement unchanged.</td>
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