

Athletic Pubalgia Surgery (for New Jersey Only)

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Related Policy
<ul style="list-style-type: none"> Surgery of the Hip (for New Jersey Only)

Application

This Medical Policy only applies to the state of New Jersey.

Coverage Rationale

Surgical treatment of athletic pubalgia is unproven and not medically necessary due to insufficient evidence of efficacy.

Applicable Codes

The following list(s) of procedure and/or diagnosis codes is provided for reference purposes only and may not be all inclusive. Listing of a code in this policy does not imply that the service described by the code is a covered or non-covered health service. Benefit coverage for health services is determined by federal, state, or contractual requirements and applicable laws that may require coverage for a specific service. The inclusion of a code does not imply any right to reimbursement or guarantee claim payment. Other Policies and Guidelines may apply.

CPT Code	Description
27299	Unlisted procedure, pelvis or hip joint
49659	Unlisted laparoscopy procedure, hernioplasty, herniorrhaphy, herniotomy
49999	Unlisted procedure, abdomen, peritoneum, and omentum

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Description of Services

Athletic groin pain is referred to by many different terms, including but not limited to, sportsman’s groin, incipient hernia, sports hernia, Gilmore’s groin, athletic pubalgia, inguinal disruption, and inguinal-related pain. Athletic groin pain is more common in male athletes than female athletes. Athletic groin pain is an exercise-related chronic condition with a variety of potential root causes. These various causes may include weakness of the abdominal/inguinal wall and injuries to tendons, muscles, and

ligaments within the pelvis. Athletic groin pain is defined as persistent groin pain during exercise in the absence of a clinically detectable hernia (Hayes, 2020).

Treatment is often targeted to the specific diagnosis. The first line of treatment consists of conservative treatments such as rest, physical therapy and rehabilitation, anti-inflammatory medications, and corticosteroid injections. Persistent symptoms may warrant surgical or laparoscopic intervention. A variety of surgical and laparoscopic techniques have been described in the literature. The aims of these procedures include releasing tension and adding support to weak musculature (Hayes, 2020).

Clinical Evidence

There is no uniform agreement in the literature for the diagnosis and treatment of athletic pubalgia. Several studies have shown that groin pain and function are improved after surgical repair. However, most of these studies were uncontrolled, used small sample sizes and did not provide comparisons of the surgical methods used to treat athletic pubalgia. Large prospective randomized studies of individuals with athletic pubalgia with more detailed patient outcome measurements are needed to determine optimal treatment.

In a systematic review that assessed the time required to return to sport (RTS), Serafim, et al. (2022) concluded that individuals who underwent surgery for pubalgia may return to sport earlier than those receiving conservative treatment, but that conservative management should be considered before surgical treatment is indicated. The authors included 10 studies with 468 patients in the quantitative analysis (with 7 studies on conservative management, two on surgical management and one comparing both). Their assessment of the quality of the evidence (based on the GRADE assessment) indicated that five were classified as high quality, three were moderate quality and two studies were very low quality. Their analysis of the seven studies that verified the effects of conservative treatment showed that the time to RTS ranged from 9.14 weeks to 18.5 weeks and the percentage of athletes who were able to RTS ranged from 14% to 100%. The analysis revealed that the time from onset of symptoms to surgery ranged from six weeks to six months. The authors stated that the most clinically relevant finding of the study was that athletes who underwent surgery for the treatment of pubalgia started to RTS three weeks after the index procedure. They found that the most common surgery performed was the Total Endoscopic Extraperitoneal (TEP) repair and that athletes who underwent TEP returned to sports on a median time of 12 weeks. With regards to the rate of return to sport, they found that 90% to 100% of athletes who underwent surgery returned to their sport. Limitations of the study include the different methods used between studies that made it difficult to generalize results, the lack of consistency in the description of the diagnosis of pubalgia among studies, the use of different health indicators and the lack of and/or variability in the criteria for RTS adding to the heterogeneity among the studies. The authors recommend additional studies with better methodological controls, larger sample sizes and the use of standard measures and criteria for RTS.

Gamborg, et al. (2022) completed a nationwide cohort study to assess the prevalence of chronic groin pain in patients who had undergone groin hernia repair for sports groin. The study was reported according to the STrengthening the Reporting of OBservational studies (STROBE) guideline and included patients who were registered in the Danish Hernia Database between the years of 1998 and 2011. There were 71 patients of 118 who were identified that agreed to participate in the study and completed four questionnaires including the Activity Assessment Scale, the Inguinal Pain Questionnaire, a visual analogue scale, and a questionnaire about treatment satisfaction. Sixty of the 71 patients were men (85%) and the median age at time of surgery was 41 years (range = 19–76). The questionnaires were completed a median of 14 years after surgery (range = 8–21). The authors found in their review of the medical records that 79% of the patients reported groin pain that they could not ignore prior to surgery. Of the 71 patients, 43 had a Lichtenstein repair (60%), 12 had other open repair without insertion of a mesh (17%), 9 had a laparoscopic repair with insertion of a mesh (13%), 7 repairs were not specified (10%) and 7 underwent unspecified procedures. The authors reported that the study showed that most patients (87%) were pain-free in the operated groin and only 20% reported physical impairment caused by groin pain, of which 55% felt pain once during the last week, and the pain episodes lasted between one minute and one hour for more than half of these patients (54%). They found that 90% of the patients overall were satisfied with the treatment and that 53 of the 71 (75%) of the patients would recommend the treatment to a friend. The authors felt the strengths of their study included the use of previously well-described questionnaires, the nationwide inclusion of patients, the measures that were included in the study (pain, physical impairment, and patient satisfaction) resulted in a broad measure of success of surgery and that the focus on current or recent pain to limit the risk of recall bias. Limitations included the low (60%) response rate (which increased the risk of selection bias), inclusion of the assessment of preoperative pain and when the pain disappeared (due to the risk of recall bias), the lack of a comparison group who received conservative treatment, the inconsistency of the information available in the medical records and the variability in

surgical approaches The authors concluded that an overwhelming percentage of patients were pain-free several years after groin hernia repair for a sports groin and that most patients were satisfied with the procedure.

In a systematic review of 47 studies involving 2,737 patients to investigate the outcomes of surgery for chronic groin pain (CGP) in athletes based on the surgical technique and anatomic site, Hatem et al. (2021) concluded that return to play at preinjury or higher level was more likely after surgery for inguinal-related CGP versus adductor related CGP. The authors reviewed studies that included four of the articles summarized below (Sheen, 2019; Roos, 2018; Kajetanek, 2018; Pokorny 2017) that included the following diagnostic terms: pubalgia, groin disruption, sportsmen hernia, Gilmore groin, sports hernia, pubic inguinal pain syndrome and core muscle injury. They then classified the studies using the Doha consensus into four categories: inguinal, adductor, pubic and iliopsoas-related groin pain. The level of evidence was classified as 1b for one study, 2b for one study and level 3 for one study with the remaining 44 studies classified as level 4 evidence by the authors as only 2 of the studies were randomized trials and the other 45 were observational studies. The authors noted that surgery was performed by a general surgeon in 29 of the studies (62%), by an orthopedic surgeon in 13 of the 47 (27%) studies, by a general and orthopedic surgeon in 4 (9%) of the studies and by a plastic surgeon in 1 (2%) of the studies. Regarding the anatomical site of surgery, the authors noted that 2,308 patients had surgery to the inguinal area (84%), to the adductor origin in 700 patients (27%) and to the pubic symphysis in 68 patients (2.5%). The authors reported that the rate of return to play at preinjury or higher level was 92% in athletes who underwent surgery to the inguinal area, 75% in athletes who underwent surgery to the adductor, 84% following surgery to the pubic symphysis and 89% after combined inguinal-adductor surgeries. They also noted that return to play at preinjury or higher level was more frequent in patients who underwent totally extraperitoneal (TEP), or transabdominal preperitoneal (TAPP) repair (97.1%) than open repair (89.5%) for patients with inguinal-related CGP. Complications were reported to include infection (in 13 studies, averaged 1.35%), reoperation (in 16 studies, averaged 2.4%) and recurrence was reported in 16 studies with an average of 4.1%. Limitations noted by the authors included the low quality of the studies due to the lack of validated and quantitative functional measures in 96% of the studies reviewed, the lack of RCTs as 98% of the studies did not include a control group, the lack of specificity in the studies that the anatomic area surgically addressed corresponded to the predominant origin of the symptoms such that patients with similar clinical presentations could have undergone different surgical approaches based on the expertise of the surgeon and that both older and newer studies were weighted equally despite the knowledge that the surgical techniques had changed over time. The authors concluded that future research including RCTs with control groups and validated quantitative functional scores are needed to assess on the surgical treatment of CGP.

Kler et al. (2021) performed a systematic review and meta-analysis of 28 studies to determine if there was an advantage in surgical outcomes following sportsman's hernia repair between two laparoscopic approaches, totally extra-peritoneal (TEP) and trans-abdominal pre-peritoneal (TAPP) repair. Their review included four of the studies summarized below including Sheen (2019), Roos (2018), Pokorny (2017) and Rossidis (2015). The studies they included consisted of 2 RCTs, 22 cohort studies and 4 case series to evaluate three outcomes including the median length of time to return to sporting activity, the incidence of complications from the procedure and the degree of postoperative pain reduction within 3 months of surgery. They did not identify any RCT that directly compared TEP to TAPP as the 2 RCTs included compared TEP to open repair in one and to physical therapy in the other. There were 2,219 patients in the analysis, of which 2,097 (94.5%) were male and the mean age was 26 years. TAPP repair accounted for 12 studies including 1,473 patients, while TEP repair accounted for 16 studies with 715 patients. All of the studies that they included in the review employed a mesh as part of the surgical procedure with 23 of the 28 studies using a standard polypropylene mesh. They also noted that 17 of the 28 studies used traumatic fixation devices including laparoscopic staples and tracking devices, four of the studies did not use any fixation at all, two of the studies used an atraumatic glue and the remaining five studies did not specify a fixation method. The median time for return to sporting activity reported by the authors was 28 days for both surgical approaches; however, meta-analysis was not plausible because many studies did not consistently report usable data. The authors noted that total pain reduction after 3 months was 94.0% when combining results of both modalities and that the total complication rate was 1.8% for both modalities with the majority being grade 1 complications such as ongoing pain, wound infection, urinary retention, and conservatively treated seromas. The authors concluded that their systematic review demonstrated that there is no significant difference between TEP and TAPP repair with regards to the three assessed outcomes. Limitations of this study identified by the authors included the variations in technique while performing the basic TEP or TAPP repair such as tension relieving techniques and mesh fixation modality, the high risk of bias in the observational studies, the variability in the assessment tools used to measure the outcomes and the variability in how time was measured for return to sporting activity among the studies. The authors recommend further RCTs comparing TEP and TAPP repair to confirm their findings.

Bisciotti et al. (2021) performed a systematic review to look at conservative treatment for longstanding (chronic) adductor-related groin pain syndrome. Twelve studies were included consisting of RCTs (n = 84) and case series (n = 400). Therapies included compression clothing therapy, manual therapy together with strengthening exercise, prolotherapy, corticoid injections, platelet rich plasma therapy, intra-tissue percutaneous electrolysis and pulse-dose radiofrequency. The authors summarized that the interventions showing the greater level of strength of evidence (moderate) and the greater grade of recommendation (C) are compression clothing therapy, manual therapy and strengthening exercises, and prolotherapy. The other types of therapeutic intervention have shown a conflicting level of strength of evidence and a grade of recommendation D. The authors concluded that compression clothing therapy, manual therapy and strengthening exercises, and prolotherapy seems to show a marked efficacy for longstanding adductor-related GPS allowing an immediate return to sports activity, with no adverse effects reported. They further concluded that the first choice in therapeutic treatment is conservative therapy, and surgical treatment should be considered only if conservative treatment fails.

Gerhardt et al. (2020) performed a retrospective case series study of athletes to determine the outcomes of a limited surgical interventions of neurolysis, inguinal wall repair and/or adductor debridement of adhesions based on intraoperative findings. A total of 51 athletes were included in the study with an average follow-up of 4.42 years. Outcome measures were the ability to return-to-sport at the same level and time to return-to-play. Nerve entrapment was demonstrated in 96.2% of cases with involvement of the ilio-inguinal in 92.5%, the ilio-hypogastric in 30.8% and the genito-femoral in 13.2%. Post-operatively, 96.1% of the participants were pain-free and returned to sport at their previous level at an average of 5.9 weeks. The authors concluded that the study showed high rates of return to sports after surgery. As a retrospective review, this study was inherently subject to selection bias. This is an uncontrolled study with a small sample size.

Sheen et al. (2019) reported on a randomized multicenter trial for the treatment of sportsman's hernia, comparing complete relief of pain by open minimal suture repair versus total extraperitoneal repair (TEP). A total of 65 athletes were enrolled, with 31 undergoing open repair, and 34 undergoing TEP. At 4 weeks post-surgery, median visual analogue scale (VAS) scores used to measure pain (VAS score 20 or less) dropped similarly in both groups compared to preoperative scores ($p < 0.001$). During sports activity at 4 weeks, VAS score of 20 or less was achieved in 14 of 31 patients after open repair and 24 of 34 patients after TEP. Return to full sporting activity after one month was achieved by 16 open repair patients and 18 TEP patients. At 3 months, return to full sporting activity was achieved by 25 and 31 patients respectively. The authors concluded that although TEP was less painful in the first month post-surgery, the effectiveness of both procedures was similar in treating the chronic pain of sportsman's hernia. The study is limited by the small sample size. Further studies are needed (cited in Hayes 2020).

An observational, prospective cohort study was conducted by Roos et al. (2018) in 32 athletes with inguinal disruption who underwent subsequent endoscopic totally extraperitoneal (TEP) repair with placement of polypropylene mesh. Patients were assessed preoperatively, 3 months postoperatively and after a median follow-up of 19 months. Follow-up was completed in 30 patients (94%). At long-term follow-up, the median pain score was 0. Three months postoperatively, improvement was shown on all physical functioning subscales. The authors concluded that athletes with inguinal disruption, selected through a multidisciplinary, systematic work-up, benefit from TEP repair. This is an uncontrolled study with a small sample size.

A retrospective single-center study on 27 patients who underwent surgery for athletic pubalgia was conducted by Kajetanek et al. (2018). Athletic pubalgia was diagnosed on physical examination by a sports physician and a surgeon and confirmed by at least one imaging technique showing injury to the abdominal wall attachment site and/or adductors. The criterion for performing surgery was failure of appropriate conservative therapy followed for at least 3 months. Eight patients had abdominal wall involvement only, seven adductor tendon involvement only, and 12 both. The patients were contacted by a physician by telephone or e-mail at least 1 year after surgery. Mean follow-up duration was 33 ± 20 months. Of the 27 patients, 25 (92.6%) returned to play (RTP), after a mean of 112 days (range, 53–223 days) and experienced no recurrence during the follow-up of at least 1 year. The remaining two patients had residual pain precluding the resumption of their sports activities. The RTP time was shorter in patients with injuries confined to the abdominal wall. The authors concluded that the results of the study confirm the high RTP rate after surgery for athletic pubalgia, with a mean RTP time of 111.8 days. The study is limited by its retrospective observations and small sample size.

Zoland et al. (2018) reviewed a case series of eighteen women with athletic pubalgia by analyzing their presentations, concomitant pathologies, and surgical outcomes. All patients received "pubalgia protocol" magnetic resonance imaging and surgical intervention. Outcomes were assessed with a patient questionnaire > 1 year after surgery. Of the 17 women, 9 had rectus aponeurotic plate injury only, or pure athletic pubalgia; the remaining 8 had athletic pubalgia in combination with ≥ 1 inguinal, obturator, and femoral hernias. Eighty-eight percent reported that the surgery was a success at follow-up. The authors

concluded that surgical repair of athletic pubalgia in women is successful in significantly reducing pain levels. They identified several limitations to this study. First, the number of studied patients was small. This was a direct result of the available population and the lower number of female patients who present with this injury. Second, the studied population consisted of mixed diagnoses, with only 9 patients having pure athletic pubalgia. Finally, this study did not evaluate the female patients diagnosed with athletic pubalgia who were not referred for surgery. Further research to include non-surgically treated patients may be of value.

A prospective clinical cohort study was conducted by Pokorny et al. (2017) to evaluate the role of transabdominal preperitoneal (TAPP) mesh repair in athletes with sportsman's groin resistant to conservative therapy. Thirty-nine professional athletes with chronic groin pain were referred to surgery at a single clinic. A full assessment was carried out on each, including medical history, physical examination, dynamic ultrasound, and pelvic magnetic resonance imaging. TAPP repair was performed on 30 athletes. The outcome measures were early postoperative recovery of 6 weeks and full resumption of athletic activities. Conservative treatment had improved symptoms temporarily or to some extent in 7 athletes and 2 ceased competing altogether. Laparoscopy confirmed posterior wall deficiency in 24 and true inguinal hernia in 6 athletes. Twenty-one (70%) returned to sports activities after 6 weeks. Persistent mild pain was experienced by 5 athletes postoperatively for up to 1 year. Twenty-five participants (85%) reported full satisfaction with the procedure 1 year after treatment; all returned to the same or even higher level of athletic performance. The authors concluded that the study confirmed that the endoscopic placement of retropubic mesh is an efficient, safe, and minimally invasive treatment that enables fast early recovery. This is a small, unblinded, uncontrolled study.

Harr and Brody (2017) reported on a case series of 22 individuals with magnetic resonance imaging (MRI) confirmation of athletic pubalgia with rectus and adductor tendonitis, who underwent a suture herniorrhaphy with adductor tenotomy. All 22 patients returned to their respective sports and within 6-8 weeks regained their ability to perform at a high level, including professional status. No further surgery was required. The authors concluded that in athletes with MRI confirmation of rectus and adductor longus injuries, tenotomies along with a herniorrhaphy may improve outcomes. Well designed, comparative studies with larger patient populations are needed to further describe safety and clinical outcomes.

A systematic review was conducted by de Sa et al. (2016) to identify the most common causes of groin pain in athletes requiring surgery. A total of 73 articles and 4,655 patients were included in the study. The intra-articular and extra-articular causes of groin pain in athletes requiring surgery were equal. The top five causes for pain were: femoroacetabular impingement (FAI) (32%), athletic pubalgia (24%), adductor-related pathology (12%), inguinal pathology (10%) and labral pathology (5%), with 35% of this labral pathology specifically attributed to FAI. The authors concluded that given the complex anatomy, equal intra-articular and extra-articular contribution, and potential for overlap of clinical entities causing groin pain leading to surgery in athletes, further studies are required to determine how to best treat this patient population.

Serner et al. (2015) performed a systematic review of the literature on the efficacy of conservative and surgical treatment options for groin pain in athletes. Nine medical databases were searched in May 2014. Inclusion criteria were treatment studies in athletes with groin pain; randomized controlled trials (RCTs), controlled clinical trials or case series; outcome measures describing number of recovered athletes, patient satisfaction, pain scores or functional outcome scores. A total of 72 studies were included for quality analysis with a mean follow-up time of 27.7 months. The conservative treatment studies included passive physical therapy modalities and/or exercise therapy, or injection therapy (corticosteroids or dextrose). The surgical studies examined open hernia repair, laparoscopic hernia repair and adductor tenotomy. The control group intervention consisted of passive physical therapy modality or exercise therapy, local corticosteroid injection, and surgical adductor repair. The treatment success was defined in terms of the percentage of recovered athletes, percentage of excellent or good patient satisfaction, improvement in pain scores, improvement in functional outcome scores or percentage of athletes returning to play. A mean of 90.6% of the patients returned to play in the intervention groups and the mean reported time to return to play was 11.3 weeks. The mean treatment success in the control groups was 48.7%. A mean of 45.8% of the patients returned to play and the mean time to return to play was 25.6 weeks. The authors state there is moderate evidence that, for adductor-related groin pain, active exercises compared with passive treatments improve success, multimodal treatment with a manual therapy technique shortens the time to return to sports compared with active exercises and adductor tenotomy improves treatment success over time. There is moderate evidence that for athletes with sportsman's hernia, surgery results in better treatment success than conservative treatment. Only four studies were identified as high quality and there were a high number of disagreements between the authors in the quality assessment.

A systematic review was performed by King et al. (2015) of peer review studies which looked at athletic groin pain (AGP) surgery and rehabilitation and their influence on return to play (RTP) rates and/or return to play times. The purpose of this review was to compare the RTP rates and return to play times between surgical and rehabilitation interventions in the treatment of AGP. There were 3,332 patients included in 57 studies. The patients were subdivided into three diagnostic groups; the pubic group with diagnosis and interventions related to the pubic symphysis and adjacent bone, the adductor tendons group, and the abdominal group. Surgery interventions included repair via laparoscopy or open incision, tenotomy of adductor longus, debridement of the pubic symphysis, or arthrodesis. Rehabilitation included massage and mobilization, electrotherapy, flexibility, resistance, and strength training. Meta-analysis revealed the pubic surgery group had a RTP rate of 86% and returned to play in 23.1 weeks, abdominal group RTP rate of 96% and returned to play in 7.2 weeks, and the adductor group RTP was 84% and returned to play in 18.3 weeks. The pubic rehabilitation group had a RTP rate of 91% and returned to play in 10.5 weeks, the abdominal group had a RTP rate of 83% and returned to play in 7.9 weeks and the adductor group RTP was 81% and returned to play in 16.9 weeks. The authors concluded that this review challenges the belief that surgery offers a superior RTP rate and time across all categories. The review suggested better outcomes with rehabilitation for pubic-related groin pain with no difference between the adductor and abdominal groups. Overall, the quality of the evidence available in the surgical and rehabilitation interventions in AGP is low and subject numbers are small. Appropriately designed randomized controlled trials should be conducted comparing rehabilitation and surgical intervention.

Rossidis et al. (2015) conducted a retrospective review of competitive athlete patients with athletic pubalgia from 2007 to 2013. Athletic pubalgia is a syndrome of chronic lower abdomen and groin pain that occurs in athletes. It is the direct result of stress and microtears of the rectus abdominis inserting on the pubis from the antagonizing adductor longus muscles, and weakness of the posterior transversalis fascia and bulging of the inguinal floor. A cohort of 54 patients was examined. Mean age was 22.4 years. Most patients were football players (n = 23), triathlon (n = 11), track and field (n = 6), soccer players (n = 5), baseball players (n = 4), swimmers (n = 3), golfer (n = 1), and tennis player (n = 1). Fifty one were males and three were females. All patients failed medical therapy with physiotherapy prior to surgery. 76% of patients had an MRI performed with 26% having a right rectus abdominis stripping injury with concomitant strain at the adductor longus musculotendinous junction. 7% of patients had mild nonspecific edema in the distal bilateral rectus abdominis muscles without evidence of a tear. Twenty patients had no findings on their preoperative MRI, and only one patient was noted to have an inguinal hernia on MRI. All patients underwent laparoscopic totally extraperitoneal inguinal hernia repair with synthetic mesh and ipsilateral adductor longus tenotomy. All patients were able to return to full sports-related activity in 24 days (range 21-28 days). One patient experienced urinary retention, and another sustained an adductor brevis hematoma 3 months after completion of rehabilitation and surgical intervention. The author concluded that athletic pubalgia is a disease with a multifactorial etiology that can be treated surgically by a laparoscopic totally extraperitoneal hernia repair with synthetic mesh accompanied with an ipsilateral adductor longus tenotomy allowing patients to return to sports-related activity early with minimal complications. The significance of this study is limited by small sample size and short follow-up period.

U.S. Food and Drug Administration (FDA)

This section is to be used for informational purposes only. FDA approval alone is not a basis for coverage.

Laparoscopic surgery is a procedure and therefore not subject to FDA regulation. There are a number of surgical meshes approved for use in pelvic surgery, although none used in the reviewed studies were approved specifically for athletic pubalgia. Refer to the following website for additional information (use product code FTM), <http://www.accessdata.fda.gov/scripts/cdrh/cfdocs/cfPMN/pmn.cfm>. (Accessed December 19, 2023)

References

- Bisciotti GN, Chamari K, Cena E, et al. The conservative treatment of longstanding adductor-related groin pain syndrome: a critical and systematic review. *Biol Sport*. 2021 Mar;38(1):45-63.
- de Sa D, Hölmich P, Phillips M, et al. Athletic groin pain: a systematic review of surgical diagnoses, investigations and treatment. *Br J Sports Med*. 2016 Oct;50(19):1181-6.
- Gamborg S, Öberg S, Rosenberg J. Long-term pain relief after groin hernia repair for sports groin: A nationwide cohort study. *Scand J Surg*. 2022 Jan-Mar;111(1):14574969211044030.

Gerhardt M, Christiansen J, Sherman B, et al. Outcomes following surgical management of inguinal-related groin pain in athletes: a case series. *J Hip Preserv Surg.* 2020;7(1):103-108.

Harr, JN, Brody, F. Sports hernia repair with adductor tenotomy. *Hernia.* 2017;21(1):139-147.

Hatem M, Martin RL, Bharam S. Surgical outcomes of inguinal-, pubic-, and adductor-related chronic pain in athletes: A systematic review based on surgical technique. *Orthop J Sports Med.* 2021 Sep 13;9(9):23259671211023116.

Hayes. Health Technology Assessment. Laparoscopic and open surgical repairs for treatment of athletic groin pain. April 2016; updated May 2020.

Kajetanek C, Benoît O, Granger B, et al. Athletic pubalgia: Return to play after targeted surgery. *Orthop Traumatol Surg Res.* 2018 Mar 13. pii: S1877-0568(18)30069-0.

King, E, Ward J, Small, L et al. Athletic groin pain: A systematic review and meta-analysis of surgical versus physical therapy rehabilitation outcomes. *Br J Sports Med.* 2015;49(22):1447-1451.

Kler A, Sekhon N, Antoniou GA, Satyadas T. Totally extra-peritoneal repair versus trans-abdominal pre-peritoneal repair for the laparoscopic surgical management of sportsman's hernia: A systematic review and meta-analysis. *Surg Endosc.* 2021 Oct;35(10):5399-5413.

Pokorny H, Resinger C, Fischer I, et al. Fast early recovery after transabdominal preperitoneal repair in athletes with sportsman's groin: A prospective clinical cohort study. *J Laparoendosc Adv Surg Tech A.* 2017;27(3):272-276.

Roos MM, Bakker WJ, Goedhart EA, et al. Athletes with inguinal disruption benefit from endoscopic totally extraperitoneal (TEP) repair. *Hernia.* 2018 Jun;22(3):517-524.

Rossidis G, Perry A, Abbas H. Laparoscopic hernia repair with adductor tenotomy for athletic pubalgia: an established procedure for an obscure entity. *Surg Endosc.* 2015 Feb;29(2):381-6.

Serafim TT, Oliveira ES, Migliorini F, et al. Return to sport after conservative versus surgical treatment for pubalgia in athletes: a systematic review. *J Orthop Surg Res.* 2022 Nov 11;17(1):484.

Serner A, van Eijck CH, Beumer BR, et al. Study quality on groin injury management remains low: a systematic review on treatment of groin pain in athletes. *Br J Sports Med.* 2015 Jun;49(12):813.

Sheen AJ, Montgomery A, Simon T, et al. Randomized clinical trial of open suture repair versus totally extraperitoneal repair for treatment of sportsman's hernia. *Br J Surg.* 2019 Jun;106(7):837-844.

Zoland M, Iraci J, Bharam S, et al. Sports hernia/athletic pubalgia among women. *Orthop J Sports Med.* 2018 Sep 14;6(9):2325967118796494.

Policy History/Revision Information

Date	Summary of Changes
05/01/2024	<p>Supporting Information</p> <ul style="list-style-type: none"> Updated <i>Clinical Evidence</i> and <i>References</i> sections to reflect the most current information Archived previous policy version CS005NJ.M

Instructions for Use

This Medical Policy provides assistance in interpreting UnitedHealthcare standard benefit plans. When deciding coverage, the federal, state, or contractual requirements for benefit plan coverage must be referenced as the terms of the federal, state, or contractual requirements for benefit plan coverage may differ from the standard benefit plan. In the event of a conflict, the federal, state, or contractual requirements for benefit plan coverage govern. Before using this policy, please check the federal, state, or contractual requirements for benefit plan coverage. UnitedHealthcare reserves the right to modify its Policies and Guidelines as necessary. This Medical Policy is provided for informational purposes. It does not constitute medical advice.

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