

ORIGINAL

## Osteitis pubis in athletes: How should it be treated during professional competition?

## Osteítis del pubis en deportistas: ¿Cómo debe tratarse durante la alta competencia?

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### ABSTRACT

**Introduction:** the osteitis pubis, also known as pubalgia, is a mainly chronic injury, very common, which significantly affects the career of athletes, mainly men and young athletes, reappearing repeatedly because it occurs in an area that is constantly active in sports life, making it difficult to rest and thus generating numerous recurrences.

**Objectives:** establish a proper management to treat this injury, taking into account the high competitiveness, and understand and know which is the most effective treatment method between surgical and conservative.

**Method:** a complete investigation will be carried out from different articles and studies carried out by health professionals about different treatments of osteitis pubis and at what time of the injury they were performed, from these to draw a conclusion according to the different results.

**Results:** different studies were reviewed, 76 athletes with a diagnosis of pubalgia, were treated with conservative methods averaging a return to activity between 3 and 6 months depending on the stage of the injury. Injection therapy showed positive results in some patients at 3-8 weeks, while other patients after 25 weeks of injection did not benefit. 198 patients were studied for surgical treatment, on average, prior to surgery, presented preoperative symptoms for 15 months and averaged a recovery time of 9 months to regain competitiveness.

**Conclusion:** the OP should be treated according to the type of lesion of each patient, it should always be started with conservative treatment, ignoring infiltrative therapies, it should not wait more than 3 months to opt for surgical treatment.

**Keywords:** Osteitis Pubis; Pubalgia; Sports Injuries; Conservative Treatment; Arthrodesis; Groin Pain Syndrome.

### RESUMEN

**Introducción:** la osteítis del pubis, también conocida como pubalgia, es una lesión principalmente crónica muy común. Afecta significativamente la carrera de los deportistas, principalmente masculinos y jóvenes, reapareciendo en reiteradas ocasiones debido a que se produce en una zona que tiene constante actividad en la vida deportiva, dificultando su reposo y generando de esta forma numerables recidivas.

**Objetivos:** establecer una correcta gestión para tratar esta lesión, teniendo en cuenta la alta competitividad, conocer y saber cuál es el método de tratamiento más eficaz entre el quirúrgico y el conservador.

**Método:** se realizará una completa investigación a partir de diferentes artículos y estudios realizados por profesionales de la salud acerca de diferentes tratamientos de la osteítis del pubis, teniendo en cuenta en qué momento de la lesión fueron realizados los mismos y, a partir de estos, sacar una conclusión según los diferentes resultados.

**Resultados:** se revisaron diferentes estudios que abarcan en conjunto a 76 deportistas con diagnóstico de

pubalgia, donde se establecieron tiempo y métodos de tratamientos conservadores promediando un regreso a la actividad entre 3 y 6 meses dependiendo el estadio de la lesión. Terapia de inyección mostró resultados positivos en algunos pacientes a las 3-8 semanas, mientras que otros pacientes luego de pasadas las 25 semanas de inyección no obtuvieron beneficios. 198 pacientes fueron estudiados por tratamiento quirúrgico, en promedio, previo a la cirugía, presentaron síntomas preoperatorios durante 15 meses y promediaron un tiempo de recuperación de 9 meses para retomar la competitividad.

**Conclusión:** la OP debe tratarse según el tipo de lesión de cada paciente. Siempre se debe comenzar por un tratamiento conservador, obviando terapias infiltrativas, y no se debe esperar más de 3 meses para optar por un tratamiento quirúrgico.

**Palabras clave:** Osteítis del Pubis; Pubalgia; Lesiones Deportivas; Tratamiento Conservador; Artrodesis.

## INTRODUCTION

Osteitis pubis (OP), also known as pubalgia, is an aseptic inflammatory injury, mainly chronic, that affects both the pubic symphysis and the soft tissues that insert there. It is very common in high-level athletes, with excessive training associated with repetitive movements (such as running, changing direction, or kicking) as the primary mechanism of injury, thus affecting the muscles of the groin region.

Because the injury occurs in an area that is constantly active in sports, it recurs frequently, significantly impairing the careers of professionals, mainly males and young people. In addition, one of the main problems arises at the time of diagnosis due to the lack of specificity of the symptoms. This means the athlete continues their daily activity without knowing that the PO is worsening.

Depending on the muscle group affected, this injury has three clinical forms (high, low, or mixed), and different treatment methods, such as physical therapy, injection therapy, and surgery, are available.

Surgery is rarely indicated for OP; in most cases, it is performed when conservative treatment fails.

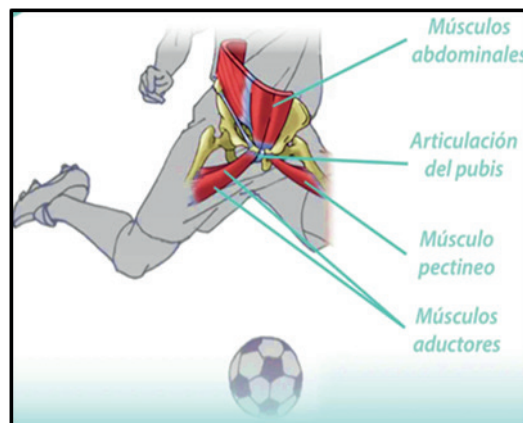


Figure 1. Site of the injury

Most authors recommend observation, physical therapy, and use of NSAIDs for at least 3 months before suggesting surgery; injection therapy remains controversial.

Various surgical procedures have been described for its treatment, including open rectus abdominis repair, mesh-reinforced repairs, laparoscopic repairs, and extensive pelvic floor repairs with or without adductor releases.

The high frequency of this injury and its progression to chronicity, hindering a high-performance career, are the main factors that motivate me to investigate the best way to manage appropriate treatment to minimize recovery time and avoid complications.

## METHOD

A descriptive observational study will be conducted based on the collection of files and clinical trials carried out by experts in sports medicine. The study will focus on up-to-date studies of professional athletes with PO to compare different treatment methods and their effectiveness.

The data collected will be evaluated to determine which methods achieved the best results and thus obtain an explicit parameter for managing treatment. As a secondary objective, we hope to gain a greater understanding of this injury and include it in this article to aid future research.

The only inclusion criteria will be professional athletes who have suffered an injury caused by training, excluding POIs caused by trauma.

## RESULTS

### Conservative treatment

Conservative treatment for adductor strains is standard. A 3-stage rehabilitation program has been described in which the athlete must be clinically pain-free (stage 1) before progressing to controlled sports training (stage 2) and then to whole team training (stage 3). The time to return to play will depend on the degree of injury. As expected, athletes with complete tears (grade 3 on MRI) will take longer to return to play. However, in the case of partial tears, the recovery time was similar between grades 1 and 2. The later stages of rehabilitation will vary depending on the sport the athlete returns to, but the same principles apply throughout the process, regardless of the sport.<sup>(1)</sup>

Compression garment therapy involves using compression shorts to reduce pain during sports activity. McKim's research<sup>(2)</sup> considered the effectiveness of compression shorts in treating athletes suffering from adductor muscle pain. This study considered 10 subjects: 8 males and two females.

The outcome of this type of treatment was evaluated using a pain rating scale that measures pain levels before and after exercise. The results showed that compression shorts significantly reduced adductor pain after exercise, and follow-up analysis indicated increased pelvic stability when the subject wore compression shorts. Based on these results, the authors concluded that compression significantly reduced adductor muscle-related POF symptoms and allowed a faster return to sports activity.<sup>(2)</sup>

Choi presented a systematic review, including five case report series of 42 athletes clinically and radiologically diagnosed with POF who underwent conservative rehabilitation with anti-inflammatory medication. Of 42 athletes, 41 followed a progressive exercise protocol. Thirty-five male soccer players with less severe POF were evaluated at stage I, and physical agents such as electrical stimulation, ultrasound, and cryomassage were implemented. The mean time to return to play averaged 3 weeks for Stage I, 7 weeks for Stage II, and 10 weeks for Stage III.<sup>(3)</sup>

We retrospectively analyzed 24 professional soccer players with OP in the Premier League (23 men, one woman; mean age: 18-24).

In 12 patients, the duration of groin pain was less than 3 months, while in 9 patients, it lasted between 3 and 6 months, and between 6 and 12 months in 3 patients. All patients were treated with conservative treatment and measures of reduced sports activity for 2-6 weeks, along with nonsteroidal anti-inflammatory medication.

All patients returned to high-level sports, but the time interval was variable, with less than 3 months in 18 patients, 3-6 months in 5 patients, and 6-12 months in 1 patient. On the other hand, 15 patients showed complete recovery without any symptoms; 9 patients had partial recovery with persistent groin pain and pain during particular movements (deterioration of long-term clinical evolution).

Among all patients, 20/24 (83,3 %) showed signs of acute POF on MRI with bone marrow edema in the pubic bones, 17/20 (85 %) bilateral, and 3/20 (15 %) unilateral. The remaining four patients presented only degenerative changes in the pubic symphysis but without inflammation (edema) related to acute OP on chronic OP. In 11/20 (55 %) patients, the edema was localized only in the cancellous bone, while in 20/9 (45 %), it also showed cortical bone involvement. The edema reached the pubic symphysis space in 8/20 (40 %) patients. In addition, fluid collection in the pubic symphysis was present in 9/24 patients (37,5 %).<sup>(4)</sup>

### Injection therapy

A corticosteroid injection into the pubic symphysis usually contains approximately 1 to 3 cc of lidocaine and/or bupivacaine and a corticosteroid.

Three studies have examined the success of steroid injections for acute and chronic POF. They have mixed results, ranging from rapid regression (within 48 hours) to prolonged recovery, taking between 8 and 10 weeks.<sup>(5)</sup>

The role of steroid injection in adductor strains remains controversial. Schliders evaluated the efficacy of injection through the bone-tendon junction in competitive athletes and assessed them for 1 year after the intervention. They concluded that athletes with MRI-documented enthesopathy and long-standing symptoms (mean, 25 weeks) did not benefit from the injection, while those with short-standing symptoms (mean, 6 weeks) showed signs of improvement. Currently, there is insufficient evidence to support the use of steroid injections in the adductor for enthesopathy. Steroid injections were used in recalcitrant cases after initial conservative treatment failed in 16 high-level athletes with a positive MRI or bone scan; 14 had immediate relief of symptoms and returned to sports activities within 48 hours. At 6 months follow-up, 7 of the 16 athletes remained asymptomatic; 1 patient received two more injections, 7 had persistent pain, and one was referred for surgery for painful joint disruption. All patients reported some improvement in their pain level, but steroid injections remain controversial.<sup>(6)</sup>

Studies using corticosteroid injection in muscle-related public in long-standing adductor muscle conditions are of low quality. Therefore, in light of the conflicting results, corticosteroid injection therapy for OP requires further study and a higher level of evidence.

In addition to our conservative approach to treating osteitis pubis, other authors have suggested nonsteroidal

anti-inflammatory infiltration of the pubic symphysis. However, they do not mention the severity of the disease at the time of injection. If started early in the syndrome, this treatment plan has shown positive results in as little as 3 to 8 weeks in our population (compared to a range of 1 to 9 months) without the need for invasive techniques or for the athlete to modify or suspend sports participation.<sup>(7)</sup>

### Surgical procedures

This study included 10 competitive soccer players diagnosed with osteitis pubis treated with arthroscopic symphysectomy at a single center. All patients were male. The mean age of the patients at the time of surgery was between 19 and 28 years. The mean follow-up of the patients was approximately 60 and 90 months. The duration of preoperative symptoms was 12 to 48 months. All patients returned to play postoperatively after an average of 3 to 8 months. In addition, the average satisfaction with surgery was 8 to 10 months, while the patient's VAS score decreased significantly from a value range of 8 to 10 preoperatively. The NPRS (Nirschl Phase Rating Scale) substantially reduced from 6 to 7 at the last follow-up. Patients resumed activity between 3 and 8 months.<sup>(8)</sup>

The 23 patients with OP (mean duration of symptoms, 13,32 months) who failed all conservative treatment measures were treated by curettage, all of whom had previously been treated with corticosteroid/anesthetic injection therapy at the pubic symphysis before surgery, which was effective for pain relief. Of the 23 patients, nine felt better, 3 had symptoms similar to those before the procedure, and two had worsened symptoms with a mean of 24,31 months (12,5-59,6 months). On the other hand, seven patients could not return to full activity. Of those who did return to full activity, the average recovery time was 5 to 6 months.

Another surgical option is wedge resection of the pubic symphysis with or without plate arthrodesis. Ten patients underwent wedge resection after 10 months of failed conservative treatment. At 9 months of follow-up, seven patients were pain-free. However, one had a recurrence of pain, another had pain in the sacroiliac joint, and the last had instability that was treated with arthrodesis. Symphysis with compression plate and bone graft may be a viable treatment option for chronic OP with reinforcement mesh.<sup>(6)</sup>

Ninety-six were treated with adductor tenotomy, and 59 were treated with combined adductor tenotomy and hernioplasty.

The mean duration of preoperative symptoms was 5 months (range, 2-24 months). All patients were males with a mean age of 16-36 years who participated in competitive soccer and had a mean Tegner score before injury of 8,360.6 (range, 8-10).

The primary outcome measures used to evaluate treatment success were the postoperative Tegner score and the patient's subjective assessment.

In the subgroup of patients with positive ultrasound findings for sports hernia and adductor pain, 27 patients were in the tenotomy group, and 48 were in the combined group. No significant differences were found between the groups regarding complications or compliance with rehabilitation. Patients returned to play in a mean of 11,6 weeks in the tenotomy group and 10,3 weeks in the combined group.<sup>(9)</sup>

**Table 1.** Surgical treatments made

	Number of patients treated	Average POP symptoms	Surgical treatment used	Time to return to competition
Author Omer Mei <sup>(8)</sup>	10	12-48 months	arthroscopic pubic symphysiodesctomy	3-8 months
Author İlker Ganai <sup>(6)</sup>	-23	-13-32 months	-Curettage	-5/6 months
	-10	-10 months		-9 months
Author r Osama Elattar <sup>(9)</sup>	-96	-5 months	-Wedge resection	-12 weeks
	-59	-5 months		-10,3 weeks

### DISCUSSION

Based on the analysis of the articles by different authors, it can be observed that the vast majority always opt to begin with conservative treatment. However, when symptoms do not subside during the rehabilitation stages, there is a difference in deciding when to perform surgery, ranging from 3 to 24 months.

Given the proven effectiveness of surgery, why is there such a long wait before it is performed? First of all, it is essential to note that before starting any treatment, making an accurate clinical diagnosis is necessary. Magnetic resonance imaging is the gold standard, as it allows for better visualization of soft tissue injuries and thus establishes a precise diagnosis and degree of injury to determine where we stand. Not all OPs will present in the same way, which is why there is such a difference in the recovery times of different athletes. Therefore, high competition and the need to return to play require imaging to be performed as soon as possible.

Conservative therapy in stages, associated with NSAIDs, kinesiology, and compression shorts, is entirely

effective in low-grade osteitis. In cases with a better prognosis, the patient can resume sports activities within a few weeks. It is essential to clarify that the process should not be accelerated even if high competition is a consideration since controversial methods, such as injection therapy, although poorly proven, may improve symptoms in some patients. Still, the constant physical activity involved in resuming activity can worsen the injury, even taking several months to heal what could have been resolved in weeks, in addition to the infectious complications that this practice can also entail.

Knowing this, opting for any surgical approach after conservative treatment has failed will depend both on the treating specialist and the athlete themselves, who must consider the stage of the season they are in. As demonstrated in the most severe cases, surgery should not be delayed for more than three months, mainly focusing on laparoscopic methods that have been effective in postoperative recovery.

In conclusion, an injury with various forms of presentation leads to different therapeutic approaches. Often, muscle injuries of this type progress silently, worsening the condition. Fortunately, advances in sports medicine have been able to adapt to the needs of each professional athlete. The methodologies used must have a minimum and maximum time frame to be considered adequate and to know when it is necessary to change the approach.

## CONCLUSIONS

Osteitis pubis is a complex, recurrent, and highly incapacitating injury, especially in high-performance athletes. The variety of its clinical forms and evolution makes an early and accurate diagnostic approach essential, with magnetic resonance imaging being a key tool for determining the degree of injury. Throughout the analysis, it has been shown that conservative treatment remains the first line of approach, demonstrating high efficacy in mild or moderate cases, provided that rehabilitation times are respected and hasty measures are avoided.

However, in cases where this approach fails, especially when symptoms persist beyond three months, it is essential to consider surgical intervention promptly. Minimally invasive surgical techniques, such as arthroscopic symphysiotomy or combined tenotomy, have shown promising results in terms of pain reduction and return to competition.

In conclusion, proper management of osteitis pubis must be based on an accurate diagnosis, progressive and personalized rehabilitation, and clinical decision-making that prioritizes the athlete's health and their prompt and safe return to high-level competition. Growing knowledge about this condition and its treatments will optimize therapeutic strategies and reduce the impact this injury can have on the careers of professional athletes.

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