Endoscopic Pubic Symphysectomy for Athletic Osteitis Pubis

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Abstract: Osteitis pubis is a common form of athletic pubalgia associated with femoroacetabular impingement. Endoscopic pubic symphysectomy was developed as a less invasive option than open surgical curettage for recalcitrant osteitis pubis. This technical note demonstrates the use of the anterior and suprapubic portals in the supine lithotomy position for endoscopic burr resection of pubic symphysis fibrocartilage and hyaline endplates. Key steps include use of the suprapubic portal for burr resection of the posteroinferior symphysis and preservation of the posterior and arcuate ligaments. Endoscopic pubic symphysectomy is a minimally invasive bone-conserving surgery that retains stability and may be useful in the treatment of recalcitrant osteitis pubis or osteoarthritis. It nicely complements arthroscopic surgery for femoroacetabular impingement and may find broader application in this group of co-affected athletes.

Athletic patients with femoroacetabular impingement (FAI) may also have osteitis pubis (OP), a common form of athletic pubalgia. A National Football League study showed a 54% prevalence of radiographic OP in athletes with FAI,1 and another study found a 5.26 increased odds ratio of symptomatic OP in a cohort with versus without radiographic FAI.2 Although OP may respond to conservative measures (e.g., relative rest, physical therapy, nonsteroidal anti-inflammatory drugs, injections), the return-to-play time may be prolonged3 and conservative treatment fails in 7% to 9% of affected patients.

Open curettage of the pubic symphysis is a surgical option that appears to be safe and effective.4 The senior author (D.K.M.) developed endoscopic pubic symphysectomy in 2009 as a less invasive treatment for OP and pubic symphyseal osteoarthritis. This technical note presents the endoscopic procedure.

Surgical Procedure

After arthroscopic or mini-open surgery for FAI (e.g., acetabuloplasty, labral refixation, and femoroplasty) and after re-draping and sterile preparation of the pubic region, outpatient dual-portal endoscopic surgery is performed with the patient in the supine lithotomy position under hypotensive general anesthesia. An indwelling urethral catheter is used, not only because of the longer cumulative operative time needed for all procedures but also for bladder decompression to minimize the risk of iatrogenic damage. Initial anteroposterior fluoroscopic spot imaging may be used to confirm the pubic symphyseal location. Two midline portals are made (Fig 1), one 2 cm proximal to the palpable superior border of the pubic symphysis (suprapubic portal) and one directly anterior to the midlevel of the pubic symphysis (anterior portal). The anterior and superior aspects of the pubic symphysis are endoscopically visualized with a 30° arthroscope after meticulous hemostasis enabling low arthroscopic pump pressures, or at or below 40 mm Hg, pubic symphysectomy is performed with a 4-mm round burr. If present, posterosuperior bone spurs should be resected. Then, burr resection proceeds from anterior (superficial) to posterior (deep) under endoscopic visualization with intermittent fluoroscopic guidance. Removal of the burr sheath aids access to the deeper (posterior) pubic symphysis. Use of a retractable-sheath burr (Retractable Sheath hip burr;
Smith & Nephew, Andover, MA) is also an option and may aid visualization by preserving controlled fluid outflow through a retracted but retained sheath. Endoscopic resection of the anterior capsule, pubic symphyseal fibrocartilage, and subchondral endplates is performed while preserving the posterior and thick arcuate (inferior) ligaments (Fig 3). The burr is interchanged between portals to facilitate pubic symphysectomy. Final posteroinferior resection is performed with the burr in the suprapubic portal, optimizing burr access to this region (Fig 4). The completed resection gap is approximately 8 to 10 mm along the entire pubic symphysis. The indwelling bladder catheter is removed after routine portal closure. Video 1 demonstrates key steps of the aforementioned procedure.

The procedure is performed as outpatient surgery. Postoperative rehabilitation includes initial weight bearing as tolerated with 2 crutches (1 to 2 weeks) and early exercise cycling with minimal resistance. In contrast to our standard postoperative FAI surgery protocol (i.e., cycling on postoperative day 1), patients undergoing endoscopic pubic symphysectomy typically are able to begin cycling within the first week. Gradual advancement to running is permitted at approximately 3 postoperative months and return to sports at 5 months, with the knowledge that the typically concurrent unilateral or bilateral FAI surgery may exert a rate-limiting influence. Key surgical steps and pearls are summarized in Tables 1 and 2.

Discussion

Although OP may have heterogeneous causes (e.g., pregnancy, infection, or athletics) with varying surgical outcomes, athletic OP tends to respond well to surgery. The conservative treatment failure rate may be 7% to 9%, but for many affected athletes, there is a prolonged period (6 to 24 months) before return to sports. For patients responding poorly to conservative measures past 12 weeks, surgical intervention is an option.

A systematic review concluded that although several surgical options for the treatment of OP exist, no single procedure was found to be substantially better than the others regarding outcomes. However, pubic symphyseal arthrodesis has potential complications of nonunion and graft harvest and hardware issues, as
well as a prolonged rehabilitation period. Major resection (including complete or wedge resection) of the pubic symphysis can destabilize the joint, leading to subsequent long-term disability requiring sacroiliac joint fusion. Open curettage of the pubic symphysis has been shown to be a safe and efficacious surgical procedure and is a less extensive operation than wedge resection and arthrodesis, with a relatively short rehabilitation time. Mini-open pubic symphysis curettage through a 5 to 7 cm Pfannenstiel incision with arthroscopic assistance and endoscopic pubic symphyseotomy have since been introduced.

A recent multicenter study described 2- to 5-year outcomes of endoscopic pubic symphyseotomy performed concurrently with arthroscopic or mini-open FAI surgery in co-affected athletes. Despite 1 patient opting to undergo revision surgery, 6 patients had a significant improvement in the mean visual analog scale pain score from 6.7 to 1.5 and the mean Non-Arthritic Hip Score from 50.2 to 84.7. The mean patient satisfaction rating was 8.3 points on a 10-point scale, there was no postoperative radiographic instability as measured by flamingo views, and the only complication was transient scrotal swelling.

We emphasize preservation of the arcuate ligament during endoscopic pubic symphyseotomy. Pelvic ring instability, even delayed sacroiliac instability requiring arthrodesis up to 20 years after wedge resection of the pubic symphysis, has been described. We have observed no iatrogenic bladder damage and recommend intraoperative Foley catheterization to decompress the bladder and retention of the posterior pubic symphyseal capsule and ligaments as a protective barrier. To minimize scrotal swelling, arthroscopic pump pressures should be low; we suggest no higher than 40 mm Hg. Meticulous hemostasis is required; we use the same radiofrequency ablation wand (Hip Vac; Smith and Nephew, Austin, TX) used for concurrent arthroscopic FAI surgery.

A recent cadaveric study confirmed the use of the suprapubic and anterior portals as being optimal for endoscopic pubic symphyseotomy. Moreover, another study has recently reported encouraging early outcomes with additional adductor longus debridement or repair in athletes with adductor tendinopathy. FAI and OP commonly coexist, and the former may be causative through increased transfer stress to the pubic symphysis from constrained hips. Although patients with both conditions may benefit from FAI or OP treatment, we believe that adding OP surgery is a reasonable approach to improve outcomes and prevent progression of OP.

### Table 1. Key Steps in Endoscopic Pubic Symphyseotomy

<table>
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<th>Step</th>
<th>Description</th>
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<tr>
<td>Locate pubic symphysis</td>
<td>Simple palpation in thin patients or option to add fluoroscopic confirmation</td>
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<tr>
<td>Establish portals</td>
<td>Anterior portal at mid distance between superior and posterior borders of PS</td>
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<tr>
<td>Perform endoscopic visualization</td>
<td>Meticulous hemostasis with RF ablator, permitting use of arthroscopic pump pressures ≤ 40 mm Hg</td>
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<tr>
<td>Perform burr resection</td>
<td>Anterior to posterior (superficial to deep), removing any posterosuperior bone spurs, pubic symphyseal fibrocartilage (may be ossified), and hyaline endplates</td>
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PS, pubic symphysis; RF, radiofrequency.
OP surgery, the best outcomes and return to sports may be obtained in patients undergoing both surgical procedures. In this setting, outpatient surgery with a single rehabilitation period may be especially attractive to a motivated athletic patient population when faced with a typically prolonged conservative treatment course. As a relatively quick minimally invasive surgery, this procedure has been performed concurrently with unilateral and even bilateral arthroscopic surgery for FAI. Moreover, pubic symphysis osteoarthrosis in isolation or accompanying OP may occur and is treatable with this procedure.

We consider endoscopic pubic symphysectomy to be an advanced procedure because of the central pubic regional anatomy. Moreover, because the procedure is commonly performed in co-affected patients, the surgeon should be quite proficient in performing arthroscopic FAI surgery before attempting additional endoscopic pubic symphysectomy.

The main advantage of endoscopic pubic symphysectomy is the less invasive nature of the approach, which complements arthroscopic or mini-open FAI surgery. Accelerated rehabilitation may be possible compared with open procedures for OP. Moreover, the endoscopic approach can visualize the conjoined tendon and adjacent adductor tendon origins, making debridement or repair of these structures possible. The main disadvantages of endoscopic pubic symphysectomy are the potential for fluid extravasation causing transient scrotal swelling and theoretic risk to adjacent structures such as the bladder.

Endoscopic pubic symphysectomy is a minimally invasive bone-conserving surgical procedure that retains stability and may be useful in the treatment of recalcitrant OP or osteoarthritis. It nicely complements arthroscopic surgery for FAI and may find broader application in this group of co-affected athletes.

References