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Wedge Resection of the Symphysis Pubis for the Treatment of Osteitis Pubis*†

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ABSTRACT: Ten patients had a wedge resection of the symphysis pubis for the treatment of symptoms of osteitis pubis that had been recalcitrant to non-operative treatment for at least six months. Preoperatively, the average duration of symptoms was thirty-two months. The symptoms included a waddling gait and crepitus, pain, and tenderness over the symphysis pubis. The early radiographic signs of the disease were rarefaction of the adjacent pubic bones and widening of the symphysis pubis. Later signs included sclerosis and narrowing of the symphyseal joint space. Pathological examination of the resected joint revealed chronic inflammatory reaction in all patients.

At an average of fourteen months postoperatively, all of the patients had marked improvement and were fully active. However, at an average of ninety-two months postoperatively, three of the ten patients were not satisfied with the result. One patient needed bilateral sacro-iliac arthrodesis for pain that was caused by instability.

Osteitis pubis is a painful, inflammatory, but non-infectious condition involving the periosteum, bone, cartilage, and ligamentous structures in the region of the symphysis pubis^{2,7,28}. Because of the variety of pathological changes with which osteitis pubis may be associated, there has been considerable confusion in the literature as to the precise cause of the disease. In 1924, Beer³ first described osteitis pubis, which developed after urological procedures. Since that time, numerous cases have been reported in association with pregnancy, rheumatological disorders, trauma, infection, and athletic exertion, as well as after urological and gynecological operations. In some patients, no obvious cause for the disease has been found^{1-5,7,9,11-23,25-29}, and no single etiological factor or agent seems to be responsible for all cases of osteitis pubis⁷.

Infectious osteitis pubis is more appropriately called osteomyelitis of the symphysis pubis. Coventry and Mitchell⁷ and Rosenthal et al.²⁷ demonstrated that non-

infectious osteitis pubis is bilaterally symmetrical and usually is self-limited. To our knowledge, no systemic symptoms, organisms, or abscesses have been identified in association with non-infectious osteitis pubis, and the condition does not respond to antibiotics. Osteomyelitis of the symphysis pubis, in contrast, is progressive, and the responsible organism can often be identified.

Post-traumatic osteitis pubis may occur after a single traumatic event or after the repetitive microtrauma that is sustained by athletes who participate in sports that involve running or kicking^{15,16,26}. Circulatory impairment about the symphysis pubis has been shown to lead to venous thrombosis, which affects the chondro-osseous margin of the joint^{5,22,29}. Parturition, with its associated relaxation of the ligamentous structures of the pelvic girdle, may lead to symphyseal or sacro-iliac pain^{9,12,14,18,25}. Several authors have reported that osteitis pubis occurs two to four times more frequently in women than in men^{7,28}. Finally, osteitis pubis may be associated with the pathological changes that occur with rheumatoid arthritis or osteoarthritis⁷.

In most patients, the symptoms of osteitis pubis are self-limited and disappear gradually after several weeks or months². A variety of treatment regimens, which often have been contradictory and of uncertain value, have been proposed. They include rest, activity, anti-inflammatory non-steroidal medication, oral and injected steroids, physical therapy, bracing, anticoagulation therapy, antibiotics, and radiation^{1,2,4,7,11,15,17,22}. Surgical treatment has been, and should be, reserved for the few patients who fail to improve either spontaneously or after non-operative treatment^{7,16,23,28}.

In 1961, Schnute²⁸ described the cases of three patients in whom a wedge resection of the symphysis pubis resulted in dramatic improvement of disabling symptoms that had not been relieved by non-operative means. Coventry and Mitchell⁷ also noted the rapid resolution of symptoms after an operation in two patients whose cases were similar to those of Schnute's patients. They stated that there is "little doubt that surgical measures can shorten the clinical course" of osteitis pubis that cannot be managed non-operatively.

In this article, we describe the symptoms, signs, and radiographic features of ten patients who had osteitis pubis that did not improve either spontaneously or after non-operative treatment. The surgical technique as well as the results of wedge resection of the symphysis pubis are reported.

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TABLE I
CLINICAL DATA ON TEN PATIENTS WHO HAD RECALCITRANT OSTEITIS PUBIS

Case	Sex	Age (Yrs.)	Level of Preoperative Pain	Preoperative Signs*	Radiographic Findings at Initial Evaluation	Duration of Symptoms Preop. (Mos.)	Duration of Follow-up (Mos.)	Results
1	F	53	Severe	LT, PC, WG	Rarefaction	8	91	Asymptomatic
2	F	47	Moderate	LT, WG	Sclerosis	24	156	Asymptomatic
3	F	46	Moderate	LT, +LCT, +CLT, WG	Sclerosis	44	89	Symphyseal click, pain in the groin
4	F	63	Severe	LT, +LCT, +CLT, WG	Sclerosis	95	83	Asymptomatic
5	F	72	Severe	LT, WG	Sclerosis	36	72	Asymptomatic
6	F	39	Moderate	LT, +CLT, WG	Rarefaction	12	79	Sacro-iliac instability, sacro-iliac pain
7	F	38	Moderate	LT, PC, WG	Rarefaction	21	111	Asymptomatic
8	F	48	Moderate	LT, PC, +LCT, +CLT, WG	Sclerosis	44	72	Symphyseal click, pain in groin and sacro-iliac region
9	F	55	Moderate	LT, PC, +LCT, +CLT, WG	Sclerosis	31	84	Asymptomatic
10	F	50	Severe	LT, WG	Rarefaction	5	84	Asymptomatic

* +CLT = positive cross-leg test, +LCT = positive lateral-compression test, LT = localized tenderness, PC = palpable click, and WG = waddling gait.

Materials and Methods

The records of 226 patients in whom osteitis pubis had been clinically diagnosed at the Mayo Clinic from 1970 through 1985 were reviewed. One hundred and eighty-five (82 per cent) of the patients were women, and forty-one (18 per cent) were men. Eleven patients (4.9 per cent) had a wedge resection of the symphysis pubis for the treatment of recalcitrant disease. One of those patients died of a cardiac arrest four months postoperatively and was not included in the series.

The remaining ten patients were women. At the time of diagnosis, the average age was 51.1 years (range, thirty-eight to seventy-two years). Nine of the patients were parous, and the average number of pregnancies was four (range, one to ten). Four patients had a history of recurrent urinary-tract infection, eight had had an abdominal hysterectomy, and one had had a cesarean section.

The onset of the symptoms had been insidious in eight patients and abrupt in two. All of the patients had moderate or severe pain (Table I). Seven characterized the pain as sharp and three, as dull, and all localized the pain to the area of the symphysis pubis. Eight patients said that the pain radiated to the groin and perineum and one, to the sacro-iliac region. In one patient, the pain was aggravated by sitting for a prolonged period; in nine patients, by walking; in five, by climbing stairs; in four, by lying on the side; and in four patients, by rolling over in bed. Coughing, sneezing, voiding, or straining at stool did not increase the pain.

All of the patients had one or more objective signs of osteitis pubis (Figs. 1-A through 1-D). All had localized tenderness to palpation over the symphysis pubis, and four

had an audible or palpable click over the symphysis pubis on examination and during daily activities. Three patients had limited abduction of the hip bilaterally, and one had a painful adductor-muscle spasm bilaterally. Four patients had a positive lateral-compression test (pain over the pubis when the patient is in the lateral decubitus position and compression is applied to the iliac wing), and five had a positive cross-leg test (pain over the pubis when the contralateral iliac wing is held down while the ipsilateral crossed extremity is stressed). One patient had a waddling antalgic gait, and nine patients said that they had such a pattern of gait when they were experiencing acute discomfort.

For all of the patients, anteroposterior radiographs, made with the patient standing, showed the bilateral involvement of the symphysis pubis that is characteristic of osteitis pubis. In the four patients who had been first seen less than six months after the onset of symptoms, the radiographs showed rarefaction and erosion of the adjacent pubic bones forming the symphysis and widening of the symphyseal joint space (Fig. 2-A). In the six patients who were first seen more than six months after the onset of symptoms, the radiographs showed sclerosis of the adjacent pubic bones and narrowing of the symphyseal joint space (Fig. 2-B).

Six patients had cystic changes in the symphysis pubis. None had radiographic evidence of osteitis condensans ilii or appreciable coxarthrosis. Mild degenerative arthrosis was seen in the sacro-iliac joints in three patients and in the lumbosacral spine in one. In the three patients who also had Chamberlain⁶ pelvic-instability radiographs (anteroposterior pelvic radiographs made while the patient stands first on one lower limb and then on the other), excursion of more



FIG. 1-A



FIG. 1-B

Figs. 1-A through 1-D: Tests for the signs of osteitis pubis.
 Fig. 1-A: Direct compression over the symphysis pubis.
 Fig. 1-B: Lateral compression test.

than two millimeters at the symphysis pubis was noted. Both men and women normally have less than two millimeters of excursion at the symphysis pubis¹⁰.

Preoperatively, all of the patients had had some form of non-operative treatment, including rest and limitation of activity, non-steroidal anti-inflammatory drugs, physical therapy, and support using a corset. Radiation therapy, oral administration of antibiotics or steroids, and local injection of steroids had all been tried at least once in one patient. Any beneficial effect of treatment had been transitory, and

in all of the patients the discomfort either had returned to the previous level or had become worse.

Preoperatively, the average duration of symptoms was thirty-two months (range, five to ninety-five months). The indication for operation was the failure of at least six months of non-operative therapy to relieve the signs and symptoms.

Operative Technique

Preoperatively, an indwelling urethral catheter is inserted to decompress the bladder and to facilitate identifi-



FIG. 1-C



FIG. 1-D

Fig. 1-C: Cross-leg test.
 Fig. 1-D: Waddling gait.

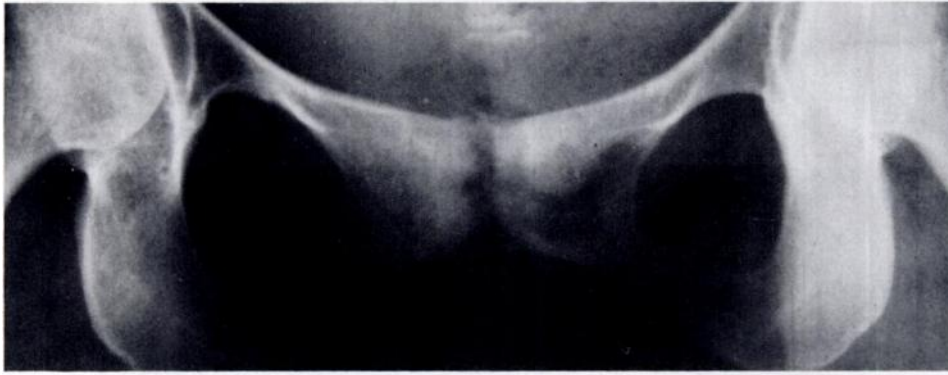


FIG. 2-A

Case 7. Three months after the onset of symptoms, this anteroposterior radiograph of the symphysis pubis shows rarefaction and widening of the joint space.

cation of the urethra during the exposure (Fig. 3). The patient is placed in the supine position on the operating table, and a ten-centimeter transverse suprapubic (Pfannenstiel) incision is made through the subcutaneous tissues and the Scarpa and Camper fascia to expose the rectus abdominis sheath. That sheath is divided in the midline along the linea alba. The pyramidalis and rectus abdominis muscles are identified and are sharply excised from their attachment on the symphysis pubis for a distance of two centimeters on either side of the joint.

The superior and posterior aspects of the pubis are exposed subperiosteally, with care being taken to avoid entering the vascular retropubic space of Retzius. The anterior aspect of the symphysis pubis is not disturbed, as this technique maintains the attachments of the pectineus, adductor longus and brevis, and gracilis muscles. Care is also taken to preserve the integrity of the superior and inferior (arcuate) pubic ligaments (Fig. 4).

With the viscera safely retracted, a reciprocating motor saw is used to remove a trapezoidal wedge of bone, leaving the anterior part of the cortex intact but excising the entire symphyseal joint. The wedge is based cephalad and posterior, extending one centimeter on either side of the joint. The apex of the wedge is caudal and anterior, and it is five millimeters wide (Fig. 5). After hemostasis, the deep fascia,

rectus abdominis muscle and its sheath, subcutaneous tissue, and skin are closed in multiple layers with absorbable sutures. A small drain is placed in the subcutaneous tissue. The space of Retzius is also drained if marked bleeding has been encountered.

Postoperative Regimen

The patient is allowed out of bed on the day after the operation. The drains are generally removed twenty-four hours postoperatively. On the second postoperative day, the patient is allowed to walk using crutches, first with a two-crutch four-point gait and progressing to a two-point gait as rapidly as tolerated. The use of crutches is discontinued two weeks postoperatively. A scultetus or other binder is not necessary.

A clinical examination was done and standing anteroposterior radiographs of the pelvis were made for all patients at an average of fourteen months (range, twelve to eighteen months) after operation. At an average of ninety-two months (range, seventy-two to 156 months) after operation, the patients were again evaluated. All completed a detailed questionnaire that had been mailed to them, and all cooperated with a telephone interview. However, none agreed to return for a clinical examination. Four patients sent radiographs that had been made by a local physician.

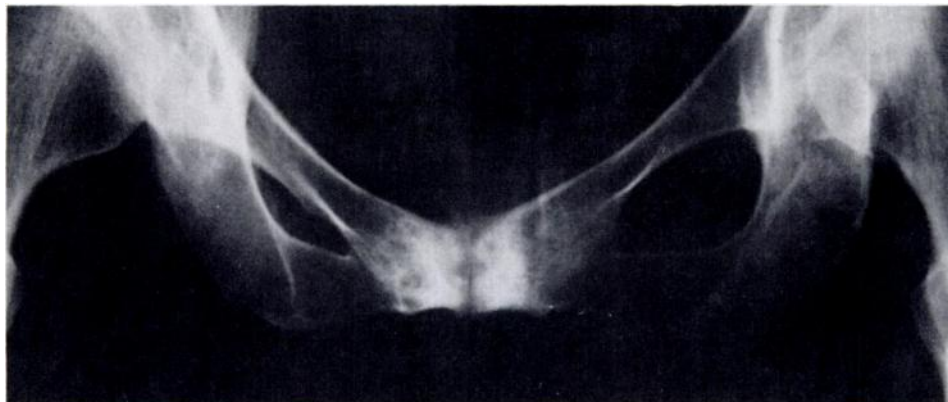


FIG. 2-B

Case 3. Fourteen months after the onset of symptoms, this anteroposterior radiograph shows sclerosis and narrowing of the joint space.

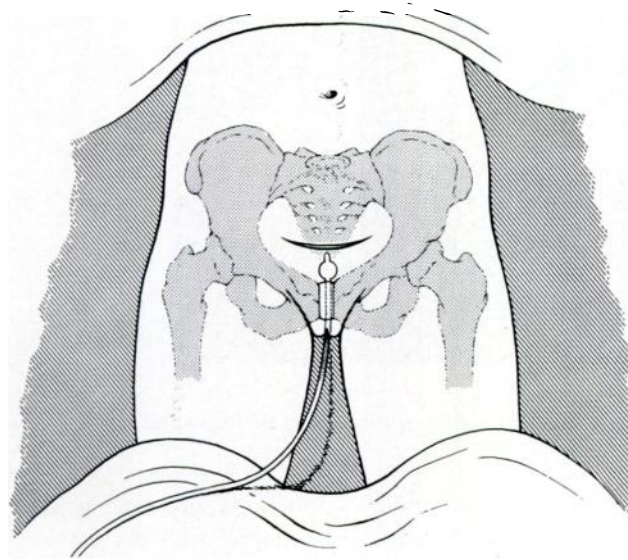


FIG. 3

To perform the wedge resection, the patient is placed supine, a urethral catheter is inserted, and a Pfannenstiel incision is made.

Results

All of the patients reported that the pain was markedly reduced two months postoperatively. At the average fourteen-month follow-up, all ten patients reported that they were satisfied with the result. Eight patients stated that they felt much better and two, that they felt better. All of the patients could walk more than six blocks comfortably, and all had returned to their previous level of activity. No patient had needed walking aids for more than four weeks after the operation.

One patient (Case 9) complained of mild discomfort, which had not been present preoperatively, in the left part of the sacro-iliac region and the lateral part of the ipsilateral thigh eighteen months postoperatively. The results of bone scintigraphy, computed tomography of the lumbosacral region, and myelography were all normal, and the cause for the discomfort was not found. Chamberlain's⁶ pelvic-instability radiographs were not made.

None of the patients complained of discomfort in the posterior part of the pelvis or of symphyseal crepitus. None of the radiographs that were made at the latest follow-up demonstrated any major changes compared with those that were made immediately postoperatively.

At an average of ninety-two months (range, seventy-two to 156 months) postoperatively, seven of the patients continued to be satisfied with the result of the operation but three did not. One patient (Case 3) stated that the preoperative symptoms of aching in the groin and clicking in the symphyseal region had returned eighty-nine months after the operation; she had no posterior pelvic discomfort. The second patient (Case 8) complained of pain in the groin and sacro-iliac joint, in addition to occasional clicking over the symphysis. These symptoms had been present preoperatively, but they did not reappear until seventy-two months after the operation. Preoperatively, this patient had had six

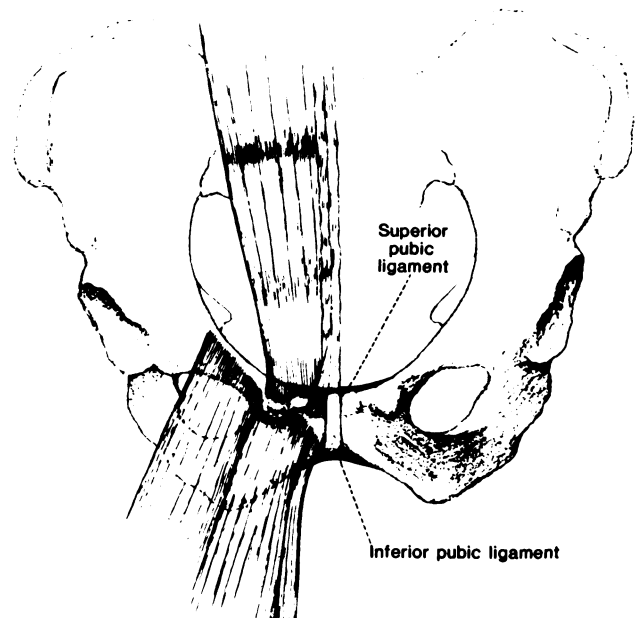


FIG. 4

The superior and inferior (arcuate) pubic ligaments must be preserved.

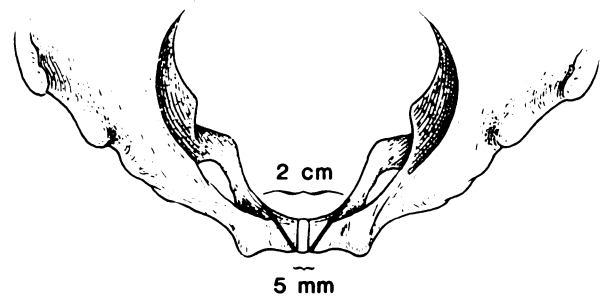
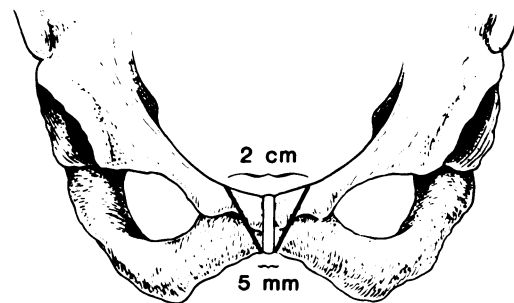


FIG. 5

The symphysis pubis is excised, in its entirety, with a trapezoidal wedge of bone, but the anterior aspect of the cortex is left intact. The base of the wedge is cephalad and posterior, and the apex is caudal and anterior.

millimeters of symphyseal excursion on the Chamberlain's radiograph.

The third patient (Case 6) who became dissatisfied with the result had had five millimeters of symphyseal motion preoperatively. Sacro-iliac instability increased bilaterally and became painful sixty-one months postoperatively. A



FIG. 6

Anteroposterior radiograph made 7.5 years after a successful wedge resection.

posterior sacro-iliac arthrodesis was done bilaterally seventy-nine months after the index operation. Eighteen months after the arthrodesis, the pelvis was stable and the patient was pain-free and was able to walk more than six blocks independently.

The pelvic radiographs that were made at the latest follow-up, at an average of ninety-two months (Cases 2, 3, 7, and 9), demonstrated no appreciable change compared with those that were made at the fourteen-month follow-up (Fig. 6).

The pathological specimens were remarkably similar in all ten patients. They consisted of chronic non-specific inflammatory tissue composed of plasma cells and lymphocytes (Fig. 7). Areas of fibrosis and focal cartilaginous metaplasia were also common. No evidence of an acute inflammatory reaction was detected. All of the cultures of tissue that had been obtained intraoperatively were negative.

No major complications were noted in the postoperative period. An abscess developed at the site of a stitch in one patient; it resolved with local wound care.

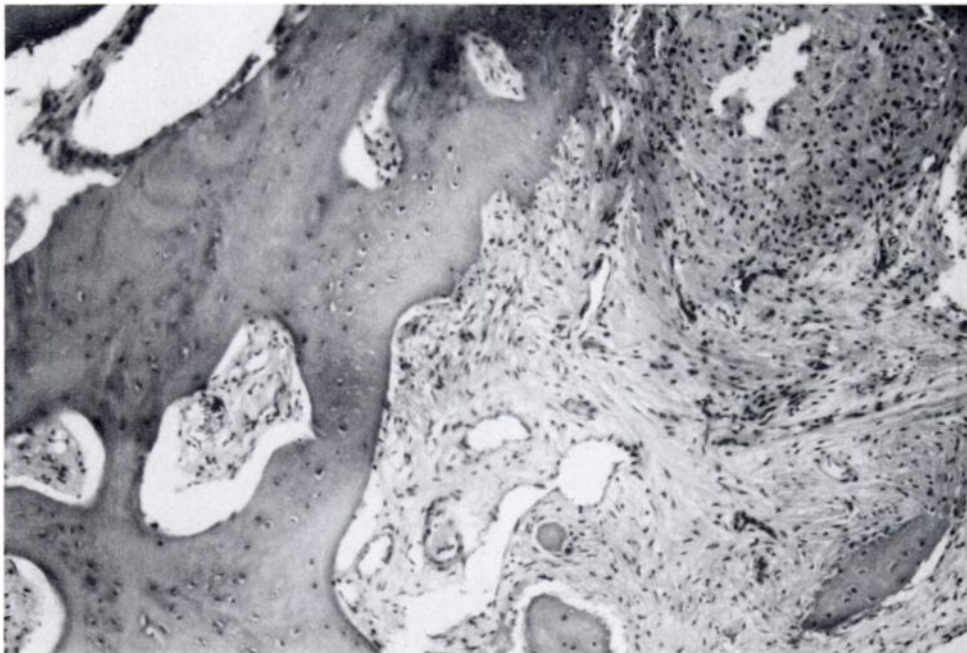


FIG. 7

Photomicrograph showing thickened osseous trabeculae (left) and fibrous replacement of marrow (hematoxylin and eosin; original magnification, $\times 250$).

Discussion

Wedge resection of the symphysis pubis for the treatment of osteitis pubis is rarely performed, and the operation has strict indications^{7,16,23,28}. In 90 to 95 per cent of patients, the symptoms resolve with non-operative treatment. Surgical procedures should be strictly reserved for those in whom the disease has proved to be resistant to non-operative therapy and who are disabled by the symptoms.

The surgical technique that was first described by Schnute²⁸ is a safe and reliable method of excising the involved symphysis pubis. The removal of the trapezoidal wedge is a very conservative osseous resection. Symphyseodesis, an alternative operation, is a more extensive procedure, and a longer time is needed for recovery^{20,24}. Symphyseodesis also has the risks that are associated with the use of any internal fixation device — that is, infection, breakage, and the need for a second operation to remove the device. Should wedge resection fail or the pelvis be unstable, symphyseodesis and fixation with a compression plate is a reasonable option.

When a human stands, the major weight-bearing forces are transmitted from the proximal parts of the femora to the acetabula and through the thick rings on the ilia called the arcuate lines^{8,10,30}. The arcuate lines curve posteriorly and superiorly to the sacro-iliac joints and into the spinal column via the sacrum. This main arch has been called the femorosacral arch. Coventry and Tapper⁸ demonstrated the importance of the sacro-iliac ligaments for maintaining pelvic stability. Anteriorly, this arch is augmented by a subsidiary tie arch that is composed of the pubic bones and their rami. The anterior tie arch is stabilized by a ligamentous complex that envelops the symphysis pubis. The thick inferior pubic (arcuate) ligament is most important and forms an arch of strong fibers that stretches from both inferior pubic rami. This ligament is preserved during wedge resection, so the integrity of the anterior tie arch is maintained.

We concluded that wedge resection of the symphysis pubis is a useful and reliable treatment for carefully selected patients who have osteitis pubis that is refractory to non-operative therapy.

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