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Use of a Central Splitting Approach and Near Complete Detachment for Insertional Calcific Achilles Tendinopathy Repaired With an Achilles Bridging Suture

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ABSTRACT

After 3 to 6 months of conservative management for insertional calcific Achilles tendinopathy, operative intervention might be warranted. Despite a success rate of 75% to 100% with surgery, no consensus has been reached on the amount of acceptable detachment of the Achilles tendon. The present case series reports on the results of a central splitting approach with 80% to 90% detachment of the Achilles insertion repaired with a double-row bridging suture device. A total of 14 patients (16 heels) for whom nonoperative management for insertional calcific Achilles tendinopathy had previously failed were enrolled in the present study they had undergone surgical management. The patients were followed up for a mean of 18 (range 11 to 25) months postoperatively and were evaluated using the American Orthopaedic Foot and Ankle Society Hind Foot scoring system, 36-item Short Form Health Survey questionnaire, and pre- and postoperative visual analog pain scale. The mean visual analog pain scale core had decreased 5.84 (range 1 to 9) points postoperatively ($p < .001$). The mean postoperative American Orthopaedic Foot and Ankle Society Hind Foot score was 87 ± 19.7 (range 52 to 105) points. One patient reported moderate pain with no limitation of activities. The mean 36-item Short-Form Health Survey score for physical functioning was 77.7 (range 30 to 100) points postoperatively in 11 patients. No patient reported incisional discomfort. All 14 patients (16 heels) reported being satisfied and had returned to their previous functional status. Thus, the central splitting Achilles approach with anchoring of the Achilles insertion using the double-row suture device is a safe and reasonable option in the operative treatment of insertional calcific Achilles tendinopathy.

The spectrum of Achilles tendinopathy encompasses a well-described triad of tendon pain, swelling, and impaired physical performance during ambulation (1). These 3 factors affect both active and sedentary individuals, with a predilection for older athletes (2,3). Although a correlation with running is an established causative factor, additional physiologic mechanisms implicated in predisposing a patient to Achilles tendon disorders include various malalignments, leg length discrepancies, and systemic conditions, including diabetes mellitus and morbid obesity (2–5). Mechanical causes from repetitive microtrauma and nonuniform stresses within the Achilles tendon include pes cavus, lateral ankle instability, and gastrocnemius tightness (2). Additionally, forefoot varus and subsequent ankle joint overpronation has been found more commonly in athletes with Achilles tendon overuse injuries (6). However, in accounting for both intrinsic and extrinsic factors, the exact pathophysiologic mechanisms behind Achilles tendinopathy have yet to be elucidated in the published data (2,7).

Although an established pathophysiologic mechanism remains to be discovered for insertional calcific Achilles tendinopathy (ICAT), the diagnosis and treatment follows a well-documented course. Patients typically present with localized pain at the bone–tendon interface, with symptoms exacerbated by uphill running or activities performed on hard surfaces (5). Clinically, patients can have bursitis of the adventitial bursa around the painful area, in addition to a prominent bony posterosuperior and lateral calcaneal exostosis, known as Haglund's deformity or *pump bump*. This should prompt the clinician to delineate the lesion from isolated retrocalcaneal bursitis, which tends to present with pain and swelling posterolaterally or anterior to the tendon (5,8).

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Table 1
Patient demographic data (N = 16 heels in 14 patients)

Patient No.	Age (y)	Laterality	Gender	BMI (kg/m^2)	Symptom Duration (mo)	Preoperative Philip and Fowler Angle (°)	Follow-Up Duration (mo)	Complications (Yes/No)
1	67	Left	Female	37.8	20	81.3	21	No
2	59	Right	Female	38.0	14	53.7	24	No
2	60	Left	Female	38.0	27	65.9	11	No
3	52	Right	Female	49.0	6	68.3	18	Yes*
4	46	Right	Female	33.0	24	72.9	17	No
4	46	Left	Female	33.0	4	78.3	3	No
5	65	Right	Female	26.6	18	79.8	18	No
6	54	Left	Male	31.4	25	67.1	15	No
7	52	Left	Male	28	10	83.2	18	No
8	48	Left	Male	39	96	82.1	22	No
9	55	Left	Female	43.1	8	64.5	25	No
10	45	Right	Female	44.6	37	69.5	13	No
11	55	Left	Female	28.4	26	70.1	21	No
12	53	Left	Female	40	7	59.9	17	No
13	51	Right	Male	23	72	73.2	18	No
14	51	Left	Female	44.1	9	75.8	4	No

Abbreviation: BMI, body mass index.
* The patient had no significant limitations at the final follow-up visit (see the discussion section for additional details).

The initial nonoperative treatment modalities include ice, activity modification, nonsteroidal anti-inflammatory medications, strengthening, heel lifts, stretching, and pads to relieve Achilles tendon pressure (5). Although these modalities provide the clinician with multiple treatment options, a grade I recommendation remains, stating that the evidence is insufficient to support the use of 1 modality over another (4). Additional measures reported in published studies include extracorporeal shock wave therapy, sclerosing agents such as polidocanol, corticosteroid injections, dextrose injections, and cryo-ultrasound (9,10). Because of the myriad of nonoperative options, patients can generally expect a 70% to 90% success rate (5,11).

Additional evaluations should be pursued after a period of conservative treatment modalities have been used, with 3 to 6 months considered the general period to determine failure of nonoperative approaches (4,12). Currently, no consensus has been reached regarding the exact period to allow when using conservative options before surgery. Radiographically, intrasubstance tendon calcification will be visible at the most proximal extent of the insertion of the tendon or as a spur off the superior portion of the calcaneus (5). Magnetic resonance imaging, although not a diagnostic tool for ICAT and rarely necessary, can be useful for surgical planning of extensive lesions (5).

The operative approaches vary, with satisfactory outcomes ranging from 75% to 100% of cases (7). Depending on the associated pathologic features, these approaches have included central heel splitting incisions, isolated or concurrent medial or lateral incisions, and hockey stick or transverse incisions (5). Although these incisional approaches have been well described, a thorough debridement of pathologic Achilles tissue is essential to improving symptoms and function (12,13). Thus, accepted operative management includes debridement of the calcific Achilles tissue, Haglund deformity excision, and excision of the retrocalcaneal bursa. A contentious point involves the amount of Achilles tendon detachment to perform, with some investigators recommending against complete detachment and others advocating complete detachment (8,12). After detachment, the surgeon must reattach the Achilles tendon using bone anchors.

The purpose of the present report was to retrospectively describe our observations of a consecutive series of patients who had undergone a central splitting Achilles approach with near complete detachment, debridement, and calcaneal exostectomy, followed by reattachment with a double-row suture bridge (DRSB; SutureBridge™, Arthrex, Inc., Naples, FL) construct.

Patients and Methods

After institutional board review approval (approval no. IRB13-016), the included patients were identified according to operative management of failed nonoperative ICAT treatment from August 2011 through September 2013 by 1 fellowship-trained foot and ankle orthopedic surgeon (J.S.L.). The patients were entered into the present study only if they had undergone surgery partial Achilles detachment, Haglund's deformity debridement, and subsequent repair with the DRSB. The inclusion criteria included ≥4 months of failed nonoperative management of ICAT, including activity modification, physical therapy, use of an ankle-foot orthosis, and self-directed icing and stretching. Additional inclusion criteria were a minimum of 4 months of symptoms before surgery and a follow-up duration of ≥6 months. The exclusion criteria were age <18 years, failure to consent, voluntary withdrawal, and <9 months of follow-up.

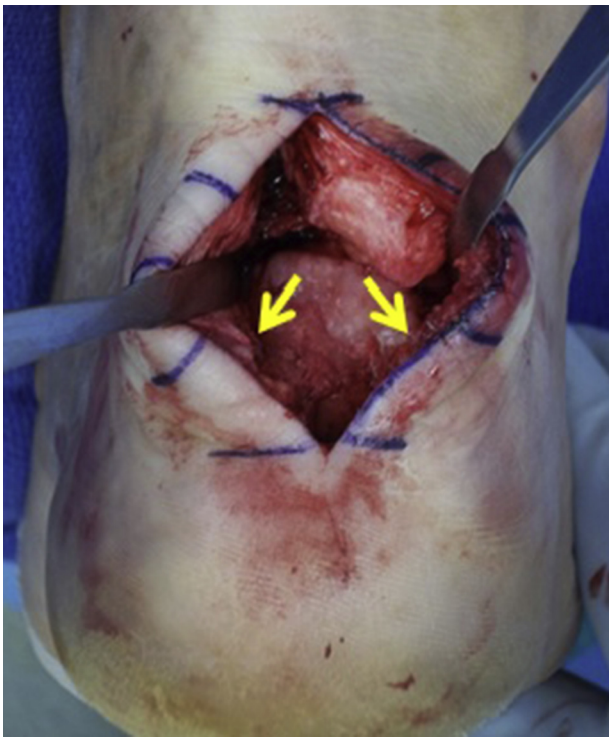

Fig. 1. Intraoperative photograph demonstrating near complete detachment of the Achilles tendon. *Arrows* show medial and lateral limbs, which remained attached to their native insertion.