

## **TOPIC: FUNCTIONAL OUTCOME OF ENDOSCOPIC DECOMPRESSION OF RETROCALCANEAL BURSTITIS**

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### **ABSTRACT:**

### **BACKGROUND:**

Retro calcaneal bursitis is an inflammation of the bursa located between Achilles tendon and the posterior edge of the calcaneus. Lateral view radiograph of ankle joint shows posterosuperior bony spur and confirms the diagnosis. Various management modalities have been described for the treatment of chronic retro calcaneal bursitis. Endoscopic surgeries being minimally invasive procedure allows early postoperative recovery and good wound healing.

### **MATERIALS AND METHODS:**

A total of 10 patients were included after fulfilling inclusion criteria between January 2019 and June 2020. All patients underwent Endoscopic decompression of retro calcaneal bursitis. All patients were assessed using AOFAS, Maryland ankle and foot score and VAS score preoperatively and post operatively at 6 weeks and 3 months follow up.

### **RESULTS:**

All patients were available for follow up. Average age of the cohort was 47.6 years. Out of 10 patients 60% were females and 40% males. Right side foot was affected in 60% and left side foot in 40% of patients. Out of 10 patients 40% had hypertension, 20% had diabetes mellitus and remaining 40% had no comorbidities. Duration of symptoms ranged from 5 months to 2 years with an average of 8.5months. AOFAS, Maryland ankle and foot score and VAS score showed better results in terms of functional outcome at 6 weeks and 3 months follow up compared to preoperative scores. There was significant improvement of the score in the follow-up periods at 6 weeks ( $P < 0.0001$ ) and at 3 months ( $P < 0.0001$ ) follow up when compared to the pre-operative score.

### **CONCLUSION:**

Endoscopic decompression of retrocalcaneal bursitis allowed better visualization of the bony spur and resect adequately. It showed several advantages including better functional outcome, good wound healing and a shorter recovery time after surgery.

**Keywords:** Achilles tendon, Retrocalcaneal bursitis, Endoscopic decompression

## INTRODUCTION:

Retrocalcaneal bursitis (RCB) is inflammation of bursa located between the Achilles tendon and the posterior edge of the calcaneus. This entity was first described by Painter<sup>1</sup> in 1898. Haglund<sup>2</sup> performed its first successful surgical treatment and described it in 1928. Although Retrocalcaneal bursitis is often seen with Achilles tendinitis or superficial bursitis, these entities are not the same.<sup>3-7</sup> The etiology, injury mechanism, treatment and rehabilitation of these Achilles tendon insertion problems are different. Chronic Retrocalcaneal bursitis was previously known as Haglund deformity, pump bump and winter heel. Recently, it has been suggested that instead of using these confusing terms, “chronic posterior calcaneal bursitis” should be used.<sup>6</sup> Various management methods have been described for the treatment of chronic Retrocalcaneal bursitis.

This leads to a large number of different technologies. The lateral view radiograph of the ankle joint shows posterosuperior bony prominence and intra tendinous calcification that confirms the diagnosis. Changes in tendon degeneration can also be demonstrated by ultrasound scans<sup>12</sup>. Multiple conservative treatment options have been described to manage retrocalcaneal bursitis, including avoidance of tight shoe heel counters, cast immobilization, non-steroidal anti-inflammatory drugs, activity modification, padding, shock wave treatment, physical therapy and injection of corticosteroids into the retrocalcaneal space.<sup>13</sup> When these measures fail, surgical treatment can be considered. Mostly the open procedures performed are through a lateral, medial or transverse Achilles tendon incision. The retrocalcaneal area is debrided and an osteotomy of the posterosuperior calcaneus is performed. These open procedures are invasive, have high complication rates and rehabilitation is extensive.<sup>14,15</sup> Therefore, an endoscopic approach was developed by Van Dijk et al.<sup>11</sup> Compared with open surgical techniques, endoscopic interventions show that the incidence of complications are always low and patient satisfaction is always high. Minimally invasive surgeries allow early postoperative recovery and minimal pain.<sup>16</sup> Therefore, we evaluated the clinical and functional outcome following endoscopic decompression of retrocalcaneal bursitis in our population.

Aim was to assess the functional outcome of endoscopic decompression of retrocalcaneal bursitis.

The objectives of this study were to determine the functional outcome of endoscopic decompression in retro calcaneal bursitis by evaluating the following parameters.

- Preoperative and postoperative radiographs.
- Pre and postoperative American Orthopaedics Foot and Ankle **Society (AOFAS) scores.**
- The Maryland ankle and foot score pre and postoperatively.
- Visual analogue scale (VAS) for analysis of pain pre and postoperatively.

## MATERIALS AND METHODS:

This prospective study was conducted in a university hospital between January 2019 to June 2020. After obtaining approval from the institutional human ethical committee, all

patients who were diagnosed clinically and radiologically as retro calcaneal bursitis, formed the study population.

All consecutive eligible patients who fulfilled the inclusion criteria and consented to participate in the study were included in the study, the inclusion criteria being age of the patients >18 years age and absence of symptomatic relief and functional improvement after three months of non-invasive treatment. Patients with severe calcific tendonitis, previous hind foot surgeries, previous history of steroid injection for retro calcaneal bursitis, previous history of calcaneal fractures were excluded from the study. Based on the survey of in patients and outpatients admitted with retrocalcaneal bursitis in our centre over one year duration, the feasible sample was considered as 10.

Preoperative x-ray was used to assess posterosuperior bony spur. The American Orthopaedic Foot and Ankle scores and Maryland ankle and foot society score was used to assess the preoperative functional ability<sup>20-21</sup>. VAS was used to assess preoperative pain score.

### **ENDOSCOPY PROCEDURE:**

The patient was positioned in prone position, with the foot hanging down the table, under spinal anaesthesia and tourniquet control for the endoscopic procedure. Two portals were made, one lateral portal for visualisation (endoscopy video system and 30degree scope) and one medial portal (working portal). The fat and the retrocalcaneal bursa were removed using arthroscopic shaver (4mm). Under endoscopic guidance burr was used to perform osseous resection, with a caution not to cause injury to the Achilles tendon. To meet the preoperative goals, resection was performed distally and anteriorly. The fragments were irrigated and suctioned from the wound. With an endoscope tendon was visualized and if necessary, the diseased Achilles tissue was debrided with the shaver. Using a 2-0 nylon wound closure was done in a single layer and tight compressive dressing was applied till middle third of the leg. Postoperatively, patients were mobilised non weight bearing walking with walker support for two weeks. Subsequently, the patients were allowed to walk with MCR footwear with heel rise for three months, followed by normal footwear.



### **INTRA OPERATIVE PATIENT POSITIONING**

Achilles tendon Bone





### **INTRAOPERATIVE PROCEDURE AND ENDOSCOPY IMAGES**



### **INTRA OPERATIVE C-ARM IMAGE FOLLOWING BONY RESECTION**

#### **Follow-up data:**

The postoperative American Orthopaedic Foot and Ankle scores at six weeks and three months were obtained. The Maryland ankle and foot score were assessed post operatively at six weeks and three months follow up. VAS (for pain) was assessed post operatively at three months follow up.

#### **Statistical analysis:**

Continuous variables were expressed as mean  $\pm$  standard deviation and the statistical significance of mean differences was compared using paired t-test across cohorts. All values were considered statistically significant if the P-value was  $< 0.05$ .

#### **PRE-OPERATIVE X RAY**





### PREOPERATIVE CLINICAL IMAGES

IMMEDIATE POST OPERATIVE RADIOGRAPHS



POST OPERATIVE RADIOGRAPHS AT 6 WEEKS FOLLOW UP



POST OPERATIVE RADIOGRAPHS AT 3 MONTHS FOLLOW UP



## POSTOPERATIVE CLINICAL IMAGES AT 3 MONTHS FOLLOW UP



### RESULTS:

#### Study population:

- The median age of the study participants was 47.5 years.
- Among the study population, 60% were female.
- 40% of the study patients did not have any co-morbidities.
- 60 % of patients were affected with right side foot.
- The average symptoms that occurred in patients were 8.5 months.
- American Orthopaedic Foot and Ankle Society (AOFAS) Ankle-Hind foot Scale was proved after surgery. The significant rise of the score in the follow-up periods at 6 weeks ( $P < 0.0001$ ) and at 3 months ( $P < 0.0001$ ) when compared to the pre-operative score as shown in table 1.
- The Visual Analogue Scale (VAS) was drastically reduced after the endoscopic procedure which was statistically significant ( $P < 0.0001$ ) than the pre-operative score as shown in table 2.
- The Maryland ankle and foot score were significantly increased after endoscopic decompression ( $P < 0.0001$ ) as shown in table 3.
- **Table 1: American Orthopaedic Foot and Ankle Society (AOFAS) Ankle-Hind foot Scale**

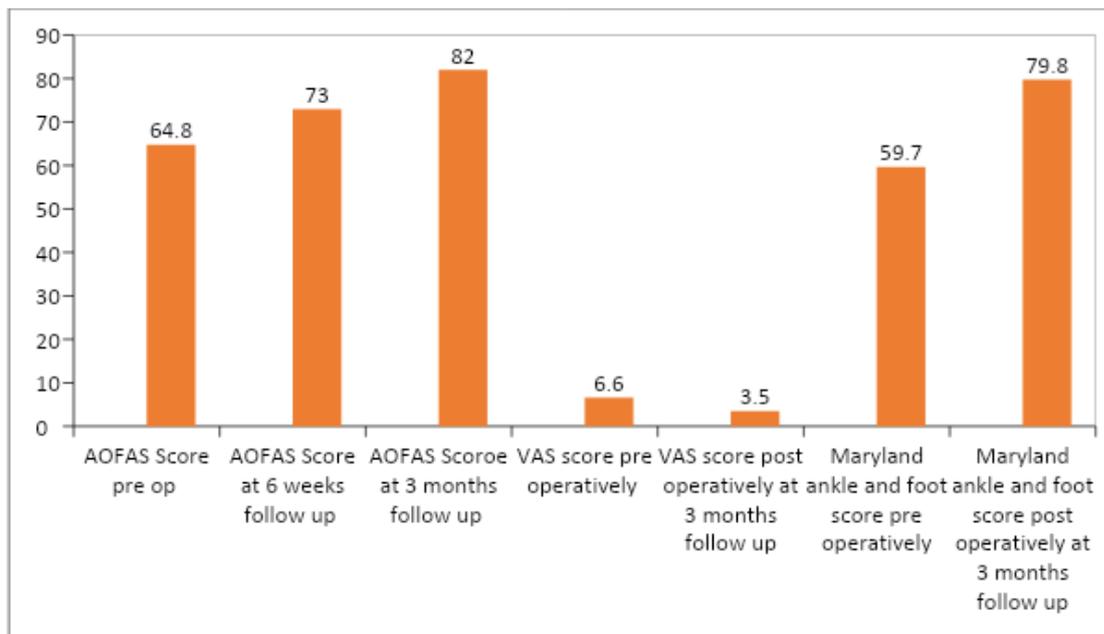
	<b>Preoperative (I)</b>	<b>Follow-up at 6 weeks (II)</b>	<b>Follow-up at 3 months (III)</b>	<b>I vs II</b>	<b>I vs III</b>
AOFAS Score	64.8 ± 3.48	73±2.53	82.2±2.74	P<0.0001	P<0.0001
95 % CI	62.3036 to 67.2964	71.1840 to 74.8160	80.2395 to 84.1605		
Standard error	1.1035	0.8028	0.8667		

**Table 2: Visual Analogue Scale (VAS)**

	<b>Preoperative</b>	<b>Postoperative at 3 months follow up</b>	<b>P value</b>
VAS Score	6.6 ± 0.69	3.5±0.84	<0.0001
95 % CI	6.0998 to 7.1002	2.8921 to 4.1079	
Standard error	0.2211	0.2687	

**Table 3: Maryland ankle and foot score**

	Preoperative	Post-operative at 3 months follow up	P value
Maryland ankle and foot score	59.7±5.90	79.8±3.45	<0.0001
95 % CI	55.4739 to 63.9261	77.3265 to 82.2735	
Standard error	1.8682	1.0934	



**Various scores status preoperatively and postoperatively at 6 weeks and 3 months follow up.**

## DISCUSSION:

In our prospective study, 10 patients were treated with endoscopic decompression of retrocalcaneal bursitis and we found cosmetically better results and the procedure allowed better visualization and adequate resection of the bony spur. No patient had Achilles tendinopathy on endoscopic visualisation, no case was reported with Achilles tendon rupture and no complications were noted postoperatively. During open surgeries, due to improper visualization of spur under the Achilles tendon, it was reported to have probability of tendon weakening or even rupture.

Our results are comparable with the below published reports on endoscopic treatment.

In our study, all patients were followed up till 3 months postoperatively and were analysed using three scoring systems. All patients showed good results in terms of pain, function and alignment. **Ortmann and colleagues**<sup>86</sup> used endoscopic techniques to perform operations on

30 patients (32 heels) with retrocalcaneal bursitis. The follow-up time was 35 months. The preoperative AOFAS score averaged 62 points and the postoperative average 97 points. There were 26 excellent results, 3 good results and 1 poor result. One patient had a rupture of the Achilles tendon who had evidence of Achilles tendinopathy endoscopically and was walking without protective walker boot postoperatively, and another patient had residual pain and swelling. Patients returned to work after an average of 8 weeks, and all athletes returned to physical activity after an average of 12 weeks. The preoperative score of our study and the study done by Ortmann et al., were similar whereas, the post-operative score was lesser in our study, this could be because of the short follow-up period compared the Ortmann et al. study which had follow up of 35 months. Ortmann et al used only one scoring system to evaluate the functional outcome postoperatively.

In our study all patients were treated with endoscopic decompression which found no complications and pain postoperatively. In a similar study by **Morag and colleagues** who treated 4 patients with endoscopic calcaneoplasty with an average follow-up of 2 years (range 1 to 3.5 years) and had no pain and complications post operatively. The advantage of endoscopic decompression is that the incision is small, avoiding complications found in open procedures like painful and/or ugly scars, and nerve entrapment within the scars, as quoted by Morag et al. study.

In our study, no open surgery was performed to compare functional outcome with endoscopic decompression and had desired level of activity at 3 months follow up. No patient was found to have soft tissue scarring, Achilles tendon injury or residual pain postoperatively. In contrary a study performed by **Le et al.**, found that in 32 patients treated with open surgical intervention who underwent clinical and radiological examination, the average course of the posterolateral calcaneal prominence caused by Haglund syndrome was followed up for an average of 18.6 years (range 2-41) and had a lot of residual symptoms.<sup>88</sup> Of these, 14 patients had soft tissue problems, including excessive scar formation and persistent swelling. In 8 patients, enough bone was not resected, and 2 had new bone formation, both of which resulted in persistent painful swelling. The Achilles tendon function was affected in 8 patients. There was no consensus on the ideal approach for open surgery method: medial, lateral, or both.

Our study performed minimally invasive surgery and patients were mobilised non-weight bearing walking with walker support for two weeks postoperatively and did not observe any adverse outcome. **Jones and James** performed 10 partial calcaneal osteotomies for retrocalcaneal bursitis, followed by a short leg walking cast for 8 weeks, progressively increasing weight bearing. Rehabilitation consisted of wearing an elevated heel of 1 inch until the foot came easily to the neutral position. All patients were back to their desired level of activity within 6 months<sup>89</sup>. The sample size was similar in this study to ours but it was an open procedure and in our study all patients underwent endoscopic procedure and had desirable level of activity at 3 months post procedure having short recovery time.

Our study being a minimally invasive surgery had no complications as compared to open surgery complications. Angermann et al used the posterolateral approach to perform operations on 40 heels and obtained the same indications in a total of 32 cases. 29 patients were allowed to bear weight immediately after surgery. Complications included one patient with superficial heel infection, one with hematoma, and two patients with delayed surgical wound healing. With an average follow-up of 6 years (range 1-12), 50% of patients were cured, 20% improved, 20% remained unchanged, and 10% of patients had worsening of

symptoms after surgical intervention. Compared to Angermann et al. study. Overall, from the available results endoscopic decompression had better functional outcome compared to open surgeries and good wound healing and a shorter recovery time after treatment.

In our study VAS score was significantly reduced after endoscopic decompression. In our study median VAS score pre-procedure was 7 and post-procedure was 3. **Cynthia E. Keen et al** study which revealed that Sixty-two patients of 218 self-reported short-term results using the 10-point VAS score who were treated with image guided retrocalcaneal bursa steroid injections. Median VAS score pre procedure was 8; the post-procedure pain score one to four weeks following treatment was 3. Our study showed similar results as that of Cynthia E. Keen et al study in terms of preoperative and postoperative VAS scores but differ in treatment management.

#### **LIMITATIONS:**

Sample size was small and therefore if study sample size was large it would have given a better conclusive result. Clinical follow-up was limited for 3 months and therefore only short term effects were studied. Not a comparative study and thus cannot compare our results with open procedure.

#### **CONCLUSION:**

- The endoscopic decompression is highly effective in patients with retrocalcaneal bursitis. It yields cosmetically better results and the procedure allows better visualization of the bony spur and resect adequately. It shows several advantages including better functional outcome, good wound healing and a shorter recovery time after treatment.

#### **REFERENCES:**

1. Painter CF. Inflammation of the post-calcaneal bursa associated with exostosis. *J Bone Joint Surg Am.* 1898 May 1;11(s1):169-80.
2. Haglund P. Beitrag zur klinik der achillessehne. *Zeitschrift Orthop.* 1928;49:49-58.
3. Jones DC, James SL. Partial calcaneal ostectomy for retrocalcaneal bursitis. *The American journal of sports medicine.* 1984 Jan;12(1):72-3.
4. Myerson MS, McGarvey W. Disorders of the Achilles tendon insertion and Achilles tendinitis. *Instructional course lectures.* 1999;48:211-8.
5. Schepsis AA, Jones H, Haas AL. Achilles tendon disorders in athletes. *The American journal of sports medicine.* 2002 Mar;30(2):287-305.
6. Van Dijk CN, Van Sterkenburg MN, Wiegelerinck JI, Karlsson J, Maffulli N. Terminology for Achilles tendon related disorders. *Knee Surgery, Sports Traumatology, Arthroscopy.* 2011 May 1;19(5):835-41.
7. Watson AD, Anderson RB, Davis WH. Comparison of results of retrocalcaneal decompression for retrocalcaneal bursitis and insertional Achilles tendinosis with calcific spur. *Foot & ankle international.* 2000 Aug;21(8):638-42.

8. Leitze Z, Sella EJ, Aversa JM. Endoscopic decompression of the retrocalcaneal space. *JBJS*. 2003 Aug 1;85(8):1488-96.
9. Ortmann FW, McBryde AM. Endoscopic bony and soft-tissue decompression of the retrocalcaneal space for the treatment of Haglund deformity and retrocalcaneal bursitis. *Foot & ankle international*. 2007 Feb;28(2):149-53.
10. Niek van Dijk C, van Dyk GE, Scholten PE, Kort NP. Endoscopic calcaneoplasty. *The American journal of sports medicine*. 2001 Mar;29(2):185-9.
11. Sharma SC, Singh R, Piplani H, Sharma A. Radiological evaluation and role of surgery in retrocalcaneal bursitis. *Hong Kong J Orthop Surg*. 2005;9:8-15.
12. van Sterkenburg MN, Muller B, Maas M, Sierevelt IN, van Dijk CN. Appearance of the weight-bearing lateral radiograph in retrocalcaneal bursitis. *Acta orthopaedica*. 2010 Jun 1;81(3):387-90.
13. Longo UG, Ramamurthy C, Denaro V, Maffulli N. Minimally invasive stripping for chronic Achilles tendinopathy. *Disability and rehabilitation*. 2008 Jan 1;30(20-22):1709-13.
14. Öhberg L, Lorentzon R, Alfredson H. Eccentric training in patients with chronic Achilles tendinosis: normalised tendon structure and decreased thickness at follow up. *British journal of sports medicine*. 2004 Feb 1;38(1):8-11.
15. Ortmann FW, McBryde AM. Endoscopic bony and soft-tissue decompression of the retrocalcaneal space for the treatment of Haglund deformity and retrocalcaneal bursitis. *Foot & ankle international*. 2007 Feb;28(2):149-53.
16. Angermann P. Chronic retrocalcaneal bursitis treated by resection of the calcaneus. *Foot & ankle*. 1990 Apr;10(5):285-7.
17. Le TA, Joseph PM. Common exostectomies of the rearfoot. *Clinics in podiatric medicine and surgery*. 1991 Jul 1;8(3):601-23.
18. Jones DC, James SL. Partial calcaneal ostectomy for retrocalcaneal bursitis. *The American journal of sports medicine*. 1984 Jan;12(1):72-3.
19. Lohrer H, Arentz S. Impingement lesion of the distal anterior Achilles tendon in sub-Achilles bursitis and Haglund-pseudoexostosis-a therapeutic challenge. *Sportverletzung Sportschaden: Organ der Gesellschaft für Orthopädisch-traumatologische Sportmedizin*. 2003 Dec 1;17(4):181-8.
20. SooHoo NF, Shuler M, Fleming LL. Evaluation of the validity of the AOFAS Clinical Rating Systems by correlation to the SF-36. *Foot & ankle international*. 2003 Jan;24(1):50-5.
21. Crichton N. Visual analogue scale (VAS). *J Clin Nurs*. 2001 Sep 1;10(5):706-6.