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Outcome of Endoscopic Decompression of Retrocalcaneal Space in Haglund's Deformity

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Abstract: ***Background: The traditional operative method of management of Haglund's deformity consists of open resection of the spur at the posterosuperior calcaneal tuberosity. An endoscopic technique was used for the management of this condition in an effort to reduce the morbidity and recovery time. The aim of the present study was to evaluate the clinical outcome of the same. Material and Methods: During the duration of 2 years, 20 patients of mean age 44.80 (range 30-65), suffering from Haglund's deformity, not responding to conservative management, underwent Endoscopic decompression of retrocalcaneal space. and were followed up at 3 weeks, 3 months and 6 months. They were evaluated on the basis of pre-operative and post-operative AOFAS scores and post-operative Maryland foot score. Results: There was a significant improvement in the AOFAS score from a mean of 65.95 pre operatively to a mean of 97.30 at 6 months after surgery. Maryland foot score was converted to non-parametric categories and majority of the patients showed good to excellent results 6 months post surgery. Conclusion: Endoscopic decompression of retrocalcaneal space can be used as an alternative to open resection of calcaneal spur in Haglund's deformity with fewer complications, lesser morbidity, high patient satisfaction and other advantages.***

Keywords: Haglund's Deformity, Endoscopic decompression, Retrocalcaneal pain, AOFAS score

1. Introduction

Haglund's deformity is also known as retrocalcaneal exostosis, Mulholland deformity and 'pump bump'. It was first described by Patrik Haglund in 1928. Although a very common clinical condition, it is still poorly understood. It has no definitive etiology but various probable causes like a tight Achilles tendon, a high arch of the foot and heredity have been proposed. It usually affects middle-aged people, females more than males, and is often bilateral. It is characterized by pain in the back of the heel which is more after rest. The pain could be due to associated Achilles tendonitisand retrocalcaneal bursitis. Inflammation of the different parts of soft tissue in the area can lead to an isolated condition, however, the treatment options are different in these conditions, and so they should be differentiated.

Other causes of retrocalcaneal pain include:

1) Retrocalcaneal bursitis-a secondary injury associated with chronicconditions such as:
- Achilles tendonitis
- Plantar Fasciitis
- Heel Spurs
- Fibromyalgia
- Rheumatoid arthritis

2) Noninsertional tendinosis

Presentation: The presenting feature is pain at posterior heel. It may be associated with limping and swelling. The pain is prominent while the patient begins to walk after rest. On Physical Examination a bump is seen on posterior heel. If a careful physical examination is done, it may be possible to differentiate whether the inflammation is anterior or posterior to the Achilles tendon.

Radiography: In a lateral radiograph, a bony prominence (Haglund's lesion) at the posterosuperior part of the calcaneal tuberosity, calcaneal bursal swelling, and increased density in pre-Achilles bursae are apparent in these patients.[1]

Conservative measures include a reassessment of the shoe of the patient and heel pads or heel lifts in the cases of high arched feet.[2] Casting may be necessary for pain reduction and an ice bag may be necessary to deal with swelling. Anti-inflammatory drugs (oral or topical), stretching exercises and physiotherapy may relieve tension from the calcaneal tendon. Local perilesional steroid injections are also used in refractory cases.[3] If conservative treatment is not effective then surgical treatment options like retrocalcaneal decompression and calcaneal ostectomy or osteotomy are used.[4]

Arthroscopy of the retrocalcaneal bursae was reported by Zimmer and Meyers[5] and Frey[6] for ecastendoscopic evaluation of Haglund's deformity and Achilles tendinitis. Arthroscopic resection of the retrocalcaneal bursae and Haglund's deformity along with a description of the entry portals and the surgical technique appeared in 1997.[7]

Complications of arthroscopic Haglund's resection are similar to those of open techniques and include medial calcaneal or sural nerve entrapment by inadvertent anterior lateral portal placement, injury to the Achilles tendon by overaggressive shaving, inadvertent under or over resection

of bone, or residual bony fragments in the surgical site. Small bony fragments in the soft tissue around the surgical site may be seen on postoperative radiographs. They are of no consequence and should not present later problems. Incisional sloughing has not occurred even when resecting large deformities. Technically, the procedure is somewhat demanding; but because of the subcutaneousnature of the deformity and easy palpation of the surgical site with instrumentation, most experienced arthroscopic surgeons are able to perform it. Because the operative site is subcutaneous, falling out of the incision is common during the procedure, and a steady hand is needed. Nerve entrapment is a rare complication because of the portalplacement.[8] Moreover, owing to the nonaggressive nature of the full-radius shaver, inadvertent trauma to the Achilles tendon should not occur. Inadvertently leaving a dorsalspicule should not present a problem because of the frequent probing of the superioraspect of the resected portion of the calcaneus. Perhaps the least common complicationis overzealous resection of the posterosuperior aspect of the calcaneus or "chasing the bump" as is common with the open procedures.[9] By directly visualizing the retrocalcaneal area, one can determine that an adequate amount of calcaneus has been resected and, under direct visualization, ensure that the insertion of the Achilles tendon has not been compromised.

The aim of this study was to evaluate results of endoscopic management of retrocalcaneal pain due to Haglund's syndrome and to record any complications associated with the procedure.

2. Material and Method

Study design: Prospective observational study.

Study Duration: July 2019 to June 2021

Study Area: This study was conducted in Department of Orthopaedics, Chhatrapati Shivaji Subharti Hospital, Meerut

Study Population: Patients presenting with Haglund's deformities, who were not responding to conservative management in Orthopaedics OPD of Chhatrapati Shivaji Subharti Hospital, Meerut. Age group 18 years and above.20 patients were studied.

Inclusion Criteria

- History and physical examination suggestive of Haglund's Deformity, not responding to conservative management
- Age group – More than 18 years

Exclusion Criteria

- Marked calcified Achilles tendinosis
- Infection
- Insertional Achilles tendinosis
- Any previous hind foot pathology
- Any previous hind foot surgery

All Patients were evaluated with preoperative history, clinical examination, routine blood investigations, X-ray lateral view of calcaneum (Image) to fulfil inclusion criteria. The American Orthopaedic foot and ankle society (AOFAS) ankle-hind foot scale was used to evaluate patients preoperatively and postoperatively at 3 weeks, 3 months and 6months. Maryland foot score was used to evaluate patients postoperatively at 6 months.

In cases of bilateral involvement, only the heel with more severe involvement was operated. The patient was taken for surgery after routine investigations and after obtaining anaesthetic fitness towards surgery. Posterosuperior calcaneal prominence was resected after removing the inflamed bursal tissue arthroscopically.

3. Results

Table 1: Age variation in the series

Age (in years)	No of patients	%
< 26	00	0
26-35	04	20
36-45	07	35
46-55	05	25
56-65	04	20
Total	20	100

Table 2: Sex distribution

Gender	No of Patients	%
Female	11	55
Male	09	45
Total	20	100

Table 3: Side distribution

Site involved	No of foot	%
Bilateral	05	25
Right	09	45
Left	06	30
Total	20	100

Table 4: Duration of symptoms

Duration of Symptoms	Frequency	%
6-10 months	9	45%
11-20 months	9	45%
>20 months	2	10%
Total	20	100%
Mean	12.95	
Range	6-25	

Table 5: Duration of Hospital Stay

Hospital stay in Days	Frequency	%
3	4	20%
4	14	70%
5	2	10%
Total	20	100%
Mean	3.90	
Range	3 – 5	

Table 6: Average AOFAS Score

	N	Pre-operative	Post-operative		
			3 weeks	3 moths	6 months
Mean ± SD	20	65.95 ± 6.09	80.60 ± 5.85	94.70 ± 4.35	97.30 ± 4.62
P Value			<0.001	<0.001	<0.001

Table 7: Average Maryland Foot Score

	N	6 Months Postperatively
Mean ± SD	20	86.10 ± 9.02
P Value		<0.001

We converted the University of Maryland scores to nonparametric categories, with 100 to 90 points indicating an excellent score; 89 to 80 points, good; 79 to 70 points, fair; and <70 points, poor. (Table 8 and Figure 8)

Table 8: Maryland Foot Score

	Score	Number of Patients	%
Excellent	100 to 90	10	50%
Good	89 to 80	6	30%
Fair	79 to 70	2	10%
Poor	Less than 70	2	10%

There were ten excellent, six good, two fair, and two poor results.

Table 9: Complications

Complications	No of patients	%
Post-operative neuralgia	01	05
Swelling and scar tenderness	01	05
Total complications	02	10

Pre-Op X-ray

Post-Op X-Ray

4. Discussion and Conclusion

Retro calcaneal pain is a disabling foot problem. Posterior heel pain is multifactorial and the causes include retrocalcaneal bursitis, insertional tendinosis, non-insertional tendinosis, superficial retrocalcaneal bursitis, and gastrocnemius contracture. In this study we dealt with retrocalcaneal pain caused due to Haglund deformity.

Nonoperative treatment is always recommended first. Our patients underwent prolonged conservative treatment, including use of heel lifts, non-steroidal anti-inflammatory agents, open-back shoes, physical therapy, avoidance of high-impact activities, and night splinting, without success. The average duration of the nonoperative treatment before the surgery was 13.85± 6.11 months (range 6 – 30 months). Steroid injection can be used when conservative treatments fail, although repeated applications may cause Achilles tendon rupture.1^{0} For this reason, nosteroid injections were applied to any of our patients. Patients who do not respond to conservative treatment are candidates for operative intervention. The aim of surgery in Haglund deformity is to remove the posterosuperiorcal caneal prominence and to decompress the inflamed surroundings of tissues. It can be achieved either by open surgery or endoscopic method. The advantages of using endoscopic technique instead of open surgery are a decreased prevalence of approach-related complications and technical efficiency. The endoscopic approach required less operative time. The improved visualization of the tendon-bone relationship with endoscopic inspection allows precise debridement and evaluation for residual impingement of Achilles tendon. The smaller access allows easier closure and less extensive post operative care.

In our study of 20 heels, the mean AOFAS SCORE preoperatively was 65.95±6.09 and post operatively, 80.60±5.85 at 3 weeks, 94.70±4.35 at 3 months and 97.30±4.62 at final follow up of 6 months. The differences were significant across all periods with P value <0.001 as per ANOVA. Hence there was a significant improvement in immediate postoperative AOFAS score and the improvement continued till even 6 months after surgery. Hence patients should be counselled about the subjective improvement after surgery which is progressive and can continue for at least 6 months. The mean Maryland Foot Score in our study was 86.10 ± 9.02 at 6 months follow-up. We converted the University of Maryland scores to nonparametric categories, with 100 to 90 points indicating an excellent score; 89 to 80 points, good; 79 to 70 points, fair; and <70 points, poor. There were ten excellent, six good, two fair, and two poor results. Our result is comparable to other studies. (Table 9)

There is a steep learning curve with the endoscopic procedure. The first procedures performed in this study took approximately one and half hour, whereas the surgical time in last patient was thirty-five minutes.

In conclusion, endoscopic calcaneal resection is a proven

alternative to open resection, with fewer complications and some advantages. A surgeon who is comfortable with arthroscopic techniques may find that this procedure is quicker and easier and allows better visualization. The small incision minimizes the potential for wound dehiscence, a painful scar, and nerve entrapment in scar tissue and it provides a cosmetically superior result. The level of postoperative pain and the time to recovery are similar to those after the open procedure.

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