

Surgical Methods Of Management Of Haglund Deformity

A.A.Shaalan, M.S.Shawky, A.Halawa and H.E.Frag

Orthopedic Surgery, Dept., Faculty of Medicine, Benha Univ., Benha, Egypt

Email: ahmedshalaan1510@gmail.com

Abstract

As a result of its great size, significant functional demands when walking, and a limited blood supply, Achilles tendons are particularly vulnerable to acute and chronic damage. Pain at the back of the heel is a frequent ailment that may be caused by a number of things. When it comes to dealing with Haglund deformity, this systematic review of the literature aims to address several treatment options, including conservative care and surgical procedures that are either open or minimally invasive. Methods: A thorough literature search was followed by study selection, study characteristics recording, and data extraction on clinical outcomes. Results: Patients' ages varied from 27.7 to 54.8 years across all trials, which may be attributed to the disease's complexity. There was a wide variation in the number of feet that were included in each investigation. Each research's follow-up period (in months) ranges from 5.2 to 57.4 months, depending on the kind and purpose of the investigation. Female predominance was evident. Operation times varied from 28.3 to 68 minutes in just six trials. Endoscopic procedures took longer to complete during surgery. Five research compared preoperative and postoperative pain using the Vas score, which dropped considerably at the conclusion of the follow-up period in all investigations. Postoperative AOFAS scores were somewhat higher for endoscopic procedures than for open ones, although the difference was not statistically significant. After conservative therapy has failed, operational intervention may be necessary in the case of Haglund's illness, as we found in our systematic review. It is the goal of management to get an athlete back to their pre-injury level of activity in the shortest amount of time feasible without substantial discomfort. For Haglund's illness, endoscopic and open calcaneoplasty are effective treatments. Clinical outcomes and postoperative complications were not significantly different between the two groups, either. In the treatment of Haglund's illness, both endoscopic and open calcaneoplasty proved to be safe and successful.

Key words: Surgical Methods - Management - Haglund Deformity.

1. Introduction:

The retrocalcaneal bursa separates the calcaneal tuberosity from the Achilles tendon, which attaches to the back of the calcaneum. The retrocalcaneal bursa and the surrounding tissue are more susceptible to chronic inflammation when the ankle is dorsiflexed, according to research [1].

Sixty-six percent of competitive and leisure athletes with AT pathology had noninsertional tendinopathy, whereas 23 percent had RB or IAT.

In comparison to the general population, 29 percent of runners showed signs of IAT, compared to only 4 percent [2].

Clinical symptoms of Haglund [3]'s syndrome include retrocalcaneal bursitis, posteroinferior calf deformity, and Achilles tendinopathy at the tendon's insertion. In Haglund syndrome, calcaneal prominence-related discomfort and edema may be caused by mechanical irritation of the soft tissue.

In cases when conservative treatment has failed, surgical intervention may be necessary. For the most part, treatment focuses on the removal of any spurs and inflammation from the Achilles tendon as well as the removal of the posteroinferior calcaneal prominence. When it comes to treating Haglund's illness surgically there are several options, including both open and endoscopic operations [4].

Procedures for open surgery include the excision of the calcaneal exostosis and removal of the retrocalcaneal bursa. It is possible to accomplish decompression of the Achilles tendon insertion using a transtendinous technique or a longitudinal midline incision. Open operations have the potential to cause hematoma, discomfort around the incision, abrupt

Achilles tendon avulsion, altered skin feeling, and stiffness. It has been hypothesized that percutaneous decompression provides favourable clinical effects [5].

Haglund's illness may be treated with a variety of open surgical techniques that include the excision of the retrocalcaneal bursa, the separation and reinsertion of the Achilles tendon, or the calcaneal osteotomy. Complications include Achilles tendon avulsion, wound dehiscence, scar discomfort, persistent posterior heel pain, ankle stiffness, altered heel sensation, sural nerve lesions, and incisional neuroma are common with these open methods [6].

95percent satisfactory and outstanding outcomes have been recorded for an alternate endoscopic approach. Open surgery has a success rate of between 50 and 93 percent. Endoscopic surgery has been found to give superior aesthetic outcomes with fewer local problems than an open operation while reducing morbidity and recovery time [7].

We set out to conduct a comprehensive evaluation of the various approaches to treating Haglund deformity and to examine various treatment options, including conservative measures and surgical procedures, such as open surgery, minimally invasive percutaneous surgery, and endoscopic surgery.

2. Patients and methods

This systematic review consisted of 4 steps, including a systematic search of the literature, selection of studies, recording of study characteristics and extraction of data on clinical outcomes.

2.1 Data sources and search strategy:

The literature search was performed according to Preferred Reporting Items for Systematic Reviews

(PRISMA) guidelines⁽⁸⁾ using the following electronic databases: the Cochrane database of systematic reviews, the Cochrane central register of controlled trials, PubMed, Scopus, Up to date, and MEDLINE as database for search, published in English. The search strategy included several different terms and synonyms for bone remodelling, denosumab, orthopedic, osteoporosis.

2.2 Locating and selecting studies:

Abstracts of articles identified using the search strategy above were viewed, and articles appearing to fulfill the inclusion criteria were retrieved in full. Data on at least one of the outcome measures were included in the study.

Selection of studies and screening of titles and abstracts:

First, all titles and abstracts were screened for the following criteria:

Article concerned: Prospective and retrospective studies.

2.3 Inclusion criteria:

1. English language of study.
2. Both sexes.

2.4 Exclusion criteria:

1. Abstracts with non-available full-text.
2. Incomplete outcome data.
3. Animal studies.

2.5 Study Selection:

The database searches are identified 158 records; 96 of them unique records identified (duplicate removed) by it; 62 were excluded based on title and abstract review; 19 articles are searched for eligibility by full text review (43 study after full-text review doesn't meet all inclusion and exclusion criteria. [30].

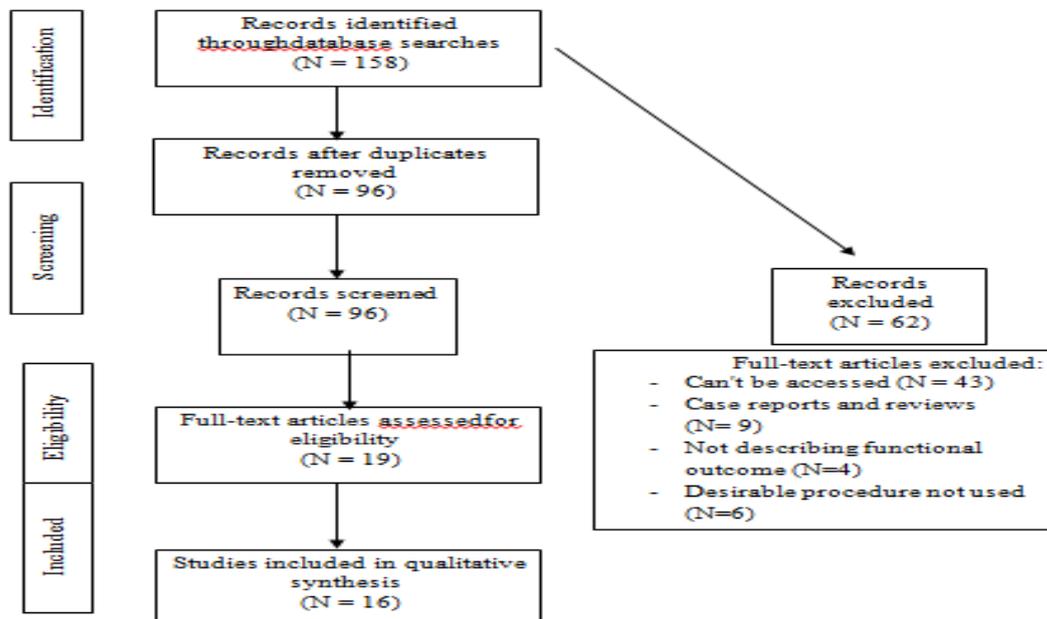


Fig. (1) PRISMA flow chart for study selection.

2.6 Study characteristics:

The following study characteristics were systematically extracted from the selected full-text papers: the authors, year of publication of the study, study type, participants, Joint involved, study follow up, gender, age and duration of study.

3. Results

Table (1) Baseline data of the studies included

STUDY	Type of technique	Operative position	Number of heels	Duration of follow up (m)	Age	Operative time (minute)	Gender	
							male	female
Jerosch, 2003	Endoscopic calcaneoplasty	Prone	10	5.2	38	46	70%	30 %
DeVries et al., 2009	Open surgery		22	40	51.6		29.4%	70.6%
Andreson et	Open surgery	Supine	67	16	49		44%	56%

al., 2008									
Chiara	Open surgery		86	156	38	-	77.6%	22.4%	
Vulpiani et al., 2003									
Calder and Saxby 2003	Open surgery		52	6	48	-	68.7%	31.3%	
Schunck and Jerosch, 2005	endoscopic calcaneoplasty	Prone	45	15.3	34	46	68.9%	31.1%	
Joresch et al., 2007	endoscopic calcaneoplasty	Supine	81	35.3	40	46	49.4%	50.6%	
Wu et al., 2012	Endoscopic calcaneoplasty	Prone	25	41	27.7	40	32%	68%	
Agarwala, et al, 2017	Open surgery	Supine	24	32	38.66		70.8%	29.2%	
Mansour, 2017	Open / endoscopic	Prone	34 (2groups)	18	31.1	Open : 50 endo.: 68	34.5%	65.5%	
Cusumano et al., 2021	Open / endoscopic	Prone	54 (2groups)	50	48.95	Open : 28.3 endo.: 30.0	57.4%	42.6%	
Mir et al., 2018	Open surgery	Lateral	29	13.5	38.7		36%	64%	
Ge et al., 2020	Open surgery	lateral	44	40	36.5		79.5%	20.5%	
Yang et al., 2020	Endoscopic calcaneoplasty	Prone	34	6	31.3		88.2%	11.8%	
Jerosch et al., 2016	Open surgery	Prone	47	57.4	54.8		46.5%	53.5%	
Allam et al., 2019	Open surgery	Prone	21	8.6	42	-	61.9%	38.1%	

Age of patients varies among all studies due to the nature of disease ranged from 27.7 to 54.8.

Number of feet included in each study are shown in the following figure ranged from 10 to 81

According to type and aim of each study, the follow-up duration (in months varies from a mean of 5.2 to 57.4 months.

There was female dominance in DeVries et al.,⁽⁹⁾ Wu et al.,⁽¹⁰⁾ Mansour,⁽¹¹⁾ Mir et al.,⁽¹²⁾.

Only 6 studies reported about operation time which ranged from 28.3 to 68 min. Endoscopic surgeries showed more time consumption during operation even with two studies^(6; 11) which compare open and endoscopic techniques

Table (2) Operative outcome among the included studies

	Type	Time to weight bearing ,w	Vas		AOFAS		Outcome (OHS/MFS/AOFAS and others)				Major Complications
			pre	post	pre	post	excell ent	good	fair	poor	
Nasef, 2003	Endo.	2					70%	30%	0	0	No
DeVries et al., 2009	Open	4	7.9	1.6			58.8 %	35.3 %	0 %	5.9 %	DVT
Andresen et al., 2005	Open	4			48.5	83.5					No major complications
Chiara Vulpiani et al., 2003	Open	2					81.6 %	16.3 %	4.7%	0	No
Calder and Saxby 2003	Open	2					No scale used in this study				avulsion in one case
Schunck and Jerosch, 2005	Endo.	12					40%	48.9 %	21.1 %		
Joresch et al., 2007	Endo.	2					50.6 %	42%	3.7%		No major complications
Wu et al., 2012	Endo.	2			63.3	86.8	60%	28%	4%	8%	No

Author	Technique	n	Pre	Post	Pre	Post	Other	Outcomes
Agarwala, et al, 2017	Open	2	6.9	0.1	55.54	91.2	.	No
Mansour, 2017	Open				61.1	80.6		1% infection
Cusumano et al., 2020	Open	2	6.32	1.2	65.67	91.7		an acute Achilles tendon rupture
	Endo.	0	7.57	1.3	66.69	93.6		
Mir et al., 2018	Open	6			54	86		No major
Ge et al., 2020	Open	9					VISA score significantly improved	non-union in one cancelous NA
Yang et al., 2020	Endo.	3	4.5	3.1	64.4	93.7	.	NA
Jerosch et al., 2016	Open	10			54	88.9		DVT in 4.7%.
Allam et al., 2019	Open	4			56	89.5	57.1 % 38.1 % 4.8%	two case developed superficial wound infection

Vas score was used in 5 studies to compare preoperative and postoperative pain which significantly decreased in all studies at the end of follow up period

Table (3)VAS pre and post-operative in selected 5 studies

VAS	Pre	post
	DeVries et al., 2009	7.9
Agarwala, et al, 2017	6.9	0.12
Cusumano et al., 2020 (open)	6.32	1.21
Cusumano et al., 2020 (endo.)	7.57	1.3
Yang et al., 2020	4.5	3.1

AOFAS score (American Orthopedic foot and Ankle Society) was used in 2 studies which used endoscopic techniques and 5 studies which used open techniques in addition to two comparative studies [6, 11]

Endoscopic techniques showed better postoperative AOFAS score but without significant difference compared to open techniques.

Table (4) AOFAS pre and post-operative in selected 9 studies

AOFAS		pre	post
Open techniques	Andresen et al., 2005	48.5	83.5
	Agarwala, et al, 2017	55.54	91.26
	Mansour, 2017 (open)	61.1	80.6
	Cusumano et al., 2020 (open)	65.67	91.78
	Mir et al., 2018	54	86
	Jerosch et al., 2016	54	88.9
	Allam et al., 2019	56	89.5
Average AOFAS in Open techniques		56.4	87.4
endoscopic calcaneoplasty	Wu et al., 2012	63.3	86.8
	Mansour, 2017 (endo.)	63.4	88.5
	Cusumano et al., 2020 (endo)	66.69	93.69
	Yang et al., 2020	64.4	93.7
Average AOFAS in endoscopic calcaneoplasty		64.4	90.7
T test		1.328	
P value		0.216	

Final Outcomes

Different scales were used in 7 studies for postoperative and follow up assessment such as

(OHS/MFS/AOFAS) and others while Chiara Vulpiani et al.,⁽¹³⁾ used their own scale.

Table (5) Final outcomes in selected 7 studies

Final outcomes		excellent	good	fair	poor
Open techniques	Allam et al., 2019	57.10%	38.10%	4.80%	0
	DeVries et al., 2009	58.80%	35.30%	0	5.90%
endoscopic calcaneoplasty	Chiara Vulpiani et al., 2003	81.60%	16.30%	4.70%	0
	Nasef, 2003	70%	30%	0	0
	Schunck and Jerosch, 2005	40%	48.90%	21.10%	0
	Joresch et al., 2007	50.60%	42%	3.70%	0
	Wu et al., 2012	60%	28%	4%	8%

4. Discussion

Patients' ages varied from 27.7 to 54.8 years across all trials because of the nature of the condition. There were tens of thousands of feet in each research.

Each research's follow-up period (in months) ranges from 5.2 to 57.4 months, depending on the kind and purpose of the investigation.

In DeVries et al. [9], Wu et al. [10], Mansour [11], and Mir et al., there was a clear female dominance [12].

Operation times varied from 28.3 to 68 minutes in just six trials. Even in two trials comparing open and endoscopic procedures, endoscopic operations took longer to perform. To compare preoperative and postoperative pain, 5 research employed the Vas score, which substantially reduced at the conclusion of follow-up periods in all investigations.

American Orthopedic Foot and Ankle Society's AOFAS (American Orthopedic Foot and Ankle Society) score was utilised for 2 studies using endoscopic procedures, 5 using open techniques, and two comparative studies [6, 11].

The AOFAS score after endoscopic surgery was higher, however the difference was not statistically significant when compared to open surgery.

A variety of measures, including (OHS/MFS/AOFAS) and others, were employed in seven studies to evaluate patients postoperatively and over time, while Chiara Vulpiani et al. [13] developed their own.

Operating on the Achilles tendon has the goal of relieving symptoms by eliminating all of the bony exostosis. Additionally, it is possible to do this procedure by making either a lateral or medial incision, which provides restricted access to the contralateral area, leading to insufficient bone resection and recurrence of symptoms. Furthermore, the anterior Achilles tendon cannot be easily accessed by these incisions [14].

Although the tendon and bursa can be adequately debrided with this method, there are concerns about the tendon's integrity and sluggish restoration to full function as well as scar irritation in this area of the heel counter. In several illness situations, arthroscopic methods have been used in place of open surgical procedures in order to reduce the risks associated with open surgery [16].

In order to remove enough bone during retrocalcaneal bursitis open surgery, good exposure is required. Wound and soft-tissue disorders are more common when the exposure is extensive. If you're

having surgery done openly, it's possible that your surgeon may recommend postoperative plaster immobilisation, which increases your chance for developing new adhesions and scar tissue. Haglund's syndrome may be treated endoscopically, which provides great lateral and medial visibility. For one thing, it provides the most thorough examination possible of the insertion of the Achilles tendon, reducing the risk of damaging the tendon and therefore allowing for early functional rehabilitation [11].

Open and endoscopic procedures had equal clinical outcomes, according to Wiegerinck et al [18] in their systematic review; however, satisfaction and complications were higher with the endoscopic approach (91 percent good or excellent results vs. 73 percent, on the basis of patient satisfaction).

For treatment of Haglund's syndrome, the endoscopic technique seemed safe and efficient, with the advantage of smaller incisions with better cosmetic appearance, less risk of weakening the Achilles tendon insertion that can cause tendon rupture, and fewer wound complications such as dehiscence, painful or ugly scars and nerve entrapment within the scars. [11].

5. Conclusion:

Following a failure of conservative therapy, surgery intervention might be necessary for Haglund's illness. It is the goal of management to get an athlete back to their pre-injury level of activity in the shortest amount of time feasible without substantial discomfort. For Haglund's illness, endoscopic and open calcaneoplasty are effective treatments. Clinical outcomes and postoperative complications were not significantly different between the two groups, either. In the treatment of Haglund's illness, both endoscopic and open calcaneoplasty proved to be safe and successful.

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