

**NEW SURGICAL TECHNIQUE FOR HAGLUND'S SYNDROME**

**A STUDY DONE AT VISA HOSPITAL, T.NAGAR, CHENNAI**



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**By**

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## NEW SURGICAL TECHNIQUE FOR HAGLUND'S SYNDROME

### INTRODUCTION

Haglund's deformity is a postero-superior prominence of the calcaneal tuberosity which is also known as pump bump or retrocalcaneal bursitis. It is a painful enlargement on the back of the heel bone that becomes irritated by shoes. It normally appears as a red, painful, and swollen area in the back of the heel bone. Rigid and prominent heel counters with high heels impinge on the soft tissues overlying the prominence and give rise to symptoms of pain and swelling. When this bony enlargement rubs against the Achilles tendon and overlying bursa, inflammation of the retrocalcaneal bursa occurs. Women tend to develop the condition more than men because of irritation from rigid heel counters in shoes that rub up and down on the back of the heel bone.

A bony growth that appears at the back of the heel bone can occur. This growth is called an exostosis (a benign cartilaginous growth) and is known as Haglund's deformity. This bony prominence can rub against the overlying Achilles tendon and causes pain in the tendon. The calcaneus (or heel bone) is the largest bone of the foot. The large Achilles tendon attaches to the back of the calcaneus. Between the bone and the Achilles tendon rests a bursa, a lubricated sac of tissue that allows the tendon to slide easily against the bone during movement of the foot. Bursae are found in many places in the body where tissues must move against one another.

This bursa that lies between the bone and the Achilles tendon usually becomes inflamed and swollen. This is called retrocalcaneal bursitis.



Haglund's deformity is often called "pump bump" because the rigid backs of pump-style shoes can create pressure that aggravates the enlargement when walking. In fact, the deformity does occur in young women who wear pumps but does not exclusively occur in that population.

Haglund's deformity can occur in one or both feet. These patients often have noticeable swelling around the insertion of the Achilles tendon and just proximal to it (eg, part of the "pump bump," presumably named in association with the wearing of high-heeled shoes or pumps).

## Diagnosis

Diagnosis for Haglund's deformity includes a physical examination and palpation of the Achilles tendon as well as x-rays to evaluate the bone structure of the heel. With Haglund's Deformity there is a large bony bump on the top, back portion of the heel bone.



X-ray image of Haglund's deformity

The bursal projection can be demonstrated radiologically by a superior calcaneal angle of more than 75 degrees, a combination of calcaneal inclination and a posterior calcaneal angle of more than 90 degrees, and excessive bone above the upper parallel pitch line.

Conservative treatment should always be implemented, and only those that have not benefited from such therapy should be considered for surgery. The results of surgery are satisfactory, provided adequate bone has been resected and no damage to local peripheral nerves or the Achilles tendon has been sustained. After a period of immobilization, an appropriate rehabilitation program must complement the treatment to ensure the early return of function to the tendons and surrounding joints.

Plain radiographs can also be used to evaluate for stress fracture of the calcaneus. If the studies are negative for a stress fracture, but a stress fracture remains a significant diagnostic consideration, the clinician may wish to pursue 3-phase bone scanning, magnetic resonance imaging (MRI), or computed tomography (CT) scanning of the calcaneus. A stress fracture causes tenderness broadly over the lateral and medial posterior calcaneus while bursitis and tendectomy tenderness is over the bursa and Achilles tendons.

MRI may demonstrate bursal inflammation and show whether there are degenerative areas within the tendon (tendinosis). Ultrasonography may be a potentially useful tool for diagnosing pathologies of the Achilles tendon.

Pain and possibly redness, are reported around the insertion of the Achilles tendon. Patients who are accustomed to wearing high-heeled shoes on a long-term basis may experience increased stretch and irritation of the Achilles tendon and its associated bursae when switching to flat shoes. Symptoms often worsen when the person first initiates an activity after a period of rest. Tenderness caused by isolated subtendinous bursitis can best be isolated by palpation just anterior to both the medial and lateral edge of the distal Achilles tendon. Tenderness due to insertional Achilles tendinitis is located slightly more distal, where the Achilles tendon inserts onto the posterior calcaneus.

## **Anatomy**

The retrocalcaneal bursa lies between the Achilles tendon and the postero-superior tuberosity of the calcaneus. The Achilles tendon inserts inferiorly in the apophyseal portion of the calcaneus, and not in the posterior-superior angle. The sural nerve lies 6 cm anterior to the lateral border of the Achilles tendon.<sup>1</sup>

## **Biomechanics and Pathogenesis**

Heredity may play a role in Haglund's deformity. Inherited foot structures that can make one prone to developing this condition include: pes cavus, Achilles tendon that is tight or walking on the lateral border of the foot.

Pes cavus can contribute to Haglund's deformity due to the attachment of the Achilles tendon. In people with pes cavus, the calcaneus is tilted backward into the Achilles tendon. This causes the uppermost portion of the back of the heel bone to rub against the tendon. Eventually, due to this constant irritation, the bursa becomes inflamed. It is the inflamed bursa that produces the redness and swelling associated with Haglund's deformity.

A tight Achilles tendon (such as in people with an equinus deformity or contracture) is thought to play a role in Haglund's deformity, by causing pain by compressing the tender and inflamed bursa.

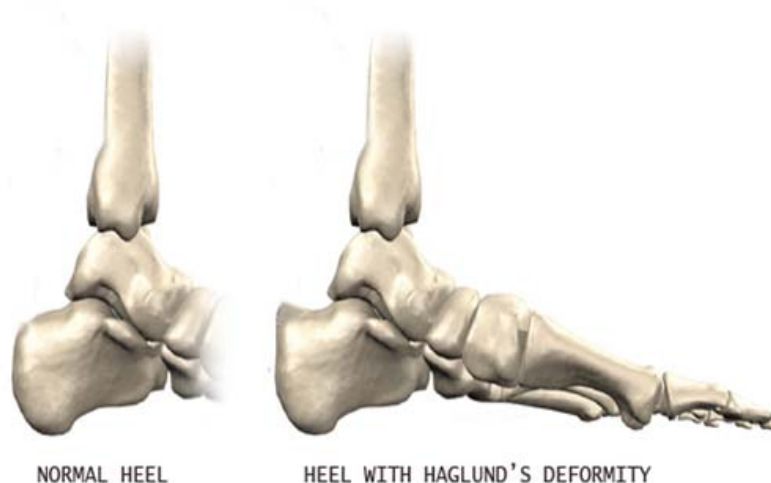
In contrast, a tendon that is more flexible results in less pressure against the painful bursa. Another possible contributor to Haglund's deformity is a tendency to walk on the lateral border of the foot. This tendency, which produces wear on the outer edge of the sole of the shoe, causes the heel to rotate inward, resulting in pressure of the heel bone against the tendon. The tendon protects itself by forming a bursa, which eventually becomes inflamed and tender.

### Characterization of Haglund's Syndrome

Haglund's deformity can occur in one or both feet. The signs and symptoms include:

- A noticeable bump on the back of heel
- Pain in the area where the Achilles tendon attaches to the heel.
- Swelling in the back of the heel.
- Redness near the inflamed tissue.

The syndrome is caused by repetitive impingement of the bursa between the ventral aspect of the Achilles tendon and the posterosuperior calcaneal prominence.



Typically, patients have pain when they start to walk after a period of rest.

Haglund's disease is characterized by pain and tenderness at the posterolateral aspect of the calcaneus where a calcaneal prominence can be palpated. This entity also is known as "pump-bump." A distinction between Haglund's disease and other pathologic conditions, such as a superficial Achilles bursitis, must be made.

Haglund's syndrome involves a painful swelling of an inflamed retrocalcaneal bursa, sometimes combined with insertional tendinopathy of the Achilles tendon.

## **Causes**

**There are absolutely various causes of Haglund's deformity, but most of them are structural. Some people have problems, because they have inherited them, when they were born. Among other vital factors are the increase in weight, improper shoes, injuries, and various activities, which can change the foot functions.**

**When you feel pain in the heel's back, you should address your doctor immediately, because it's one of the Haglund's deformity symptoms. But when you are reading this article having no such problems yet, you should take some preventive measures. Wear padding or shoes to reduce the area friction, use ice as it reduces pain. When you have chronic pain, use heat therapy and massages.**

**(i) High arches (pes cavus) can contribute to Haglund's deformity. The Achilles tendon attaches to the back of the heel bone, and in a person with high arches, the heel bone is tilted backward into the Achilles tendon. This causes the uppermost portion of the back of the heel bone to rub against the tendon. Eventually, due to this constant irritation, a bony protrusion develops and the bursa becomes inflamed. It is the inflamed bursa that produces the redness and swelling associated with Haglund's deformity.**

**(ii). A tight Achilles tendon can also play a role in Haglund's deformity, causing pain by compressing the tender and inflamed bursa. In contrast, a tendon that is more flexible results in less pressure against the painful bursa.**

**(ii). Another possible contributor to Haglund's deformity is a tendency to walk on the outside of the heel (varus heel). This tendency, which produces wear on the outer edge of the sole of the shoe, causes the heel to rotate inward, resulting in a grinding of the heel bone against the tendon. The tendon protects itself by forming a bursa, which eventually becomes inflamed and tender.**

**(iv). Heredity may play a role in Haglund's deformity. Inherited foot structures that can make one prone to developing this condition include: pes cavus, Achilles tendon that is tight or walking on the lateral border of the foot.**

## **Conservative Treatment**

**Non-surgical treatment of Haglund's deformity is aimed at reducing the inflammation of the bursa. While these approaches can resolve the bursitis, they will not shrink the bony protrusion. Non-surgical treatment can include one or more of the following:**

**Medication :** Anti-inflammatory medications may help reduce the pain and inflammation. Topical anti-inflammatories can be helpful.

**Ice :** To reduce swelling, apply a bag of ice over a thin towel to the affected area for 20 minutes of each waking hour. Do not put ice directly against the skin.

**Stretching exercises :** Stretching can help relieve tension from the Achilles tendon in those patients with a tight heel cord.

**Heel lift :** Patients with high arches may find that heel lifts placed inside the shoe decrease the pressure on the heel.

**Heel pads :** Placing pads inside the shoe cushions the heel and may help reduce irritation when walking.

**Shoe modification :** Wearing shoes that are backless or have soft backs will avoid or minimize irritation.

**Physical therapy :** Inflammation is sometimes reduced with certain forms of physical therapy, such as ultrasound therapy.

**Orthotic devices :** These custom arch supports are helpful because they control the motion in the foot. They can include a heel lift.

**Immobilization :** In some cases, casting may be necessary to reduce symptoms.

**Cortisone injections in this area are not recommended due to the risk of tendon rupture. When basic treatments do not help, one needs surgical interference or injections. After the surgery, the foot will be immobilized for a definite period of time.**



## MEASUREMENT OF HAGLUND

Image A - Using parallel pitch lines (lines BC and AC are parallel), magnitude of prominence of the posterosuperior calcaneal tuberosity can be assessed.

Image B - When the tuberosity exceeds level of line BC, Haglund's deformity occurs.

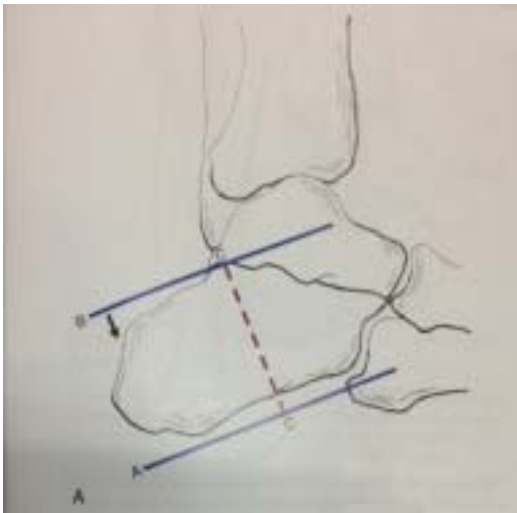


Image A

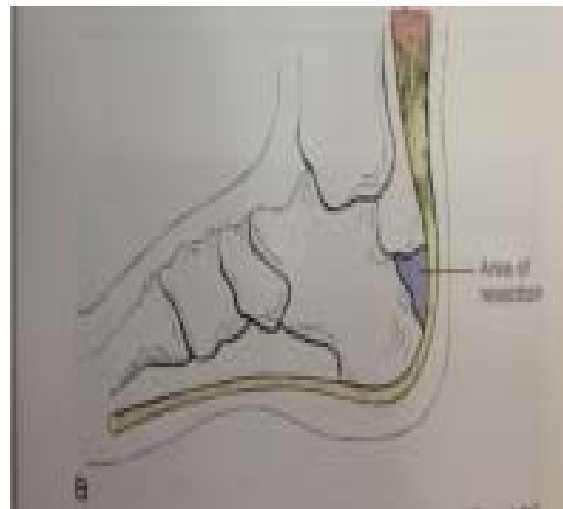


Image B showing the area of resection

### Measurement of Haglund

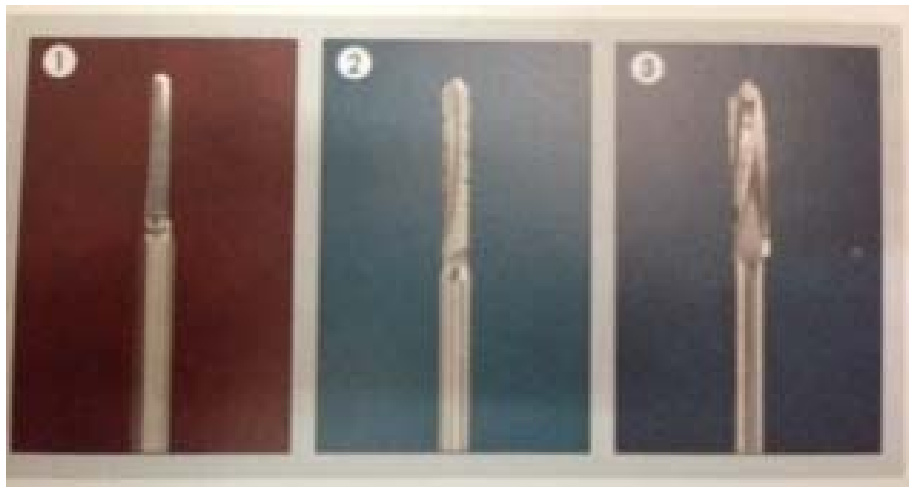
## METHODS

### Operative Treatment:

If non-surgical treatment fails to provide adequate pain relief, surgery may be needed. The foot and ankle surgeon will determine the procedure that is best suited to your case. It is important to follow the surgeon's instructions for post-surgical care.

#### 1. Excision by MIS ( Minimally Invasive Surgery):

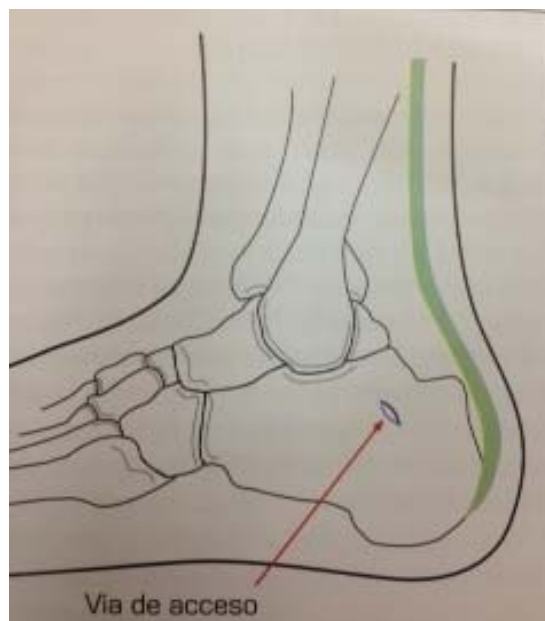
Special instruments required : 1. Osada mini drill & micro motor, 2. Mini drill bit & burrs & 3. Image intensifier.



**Special Burrs**

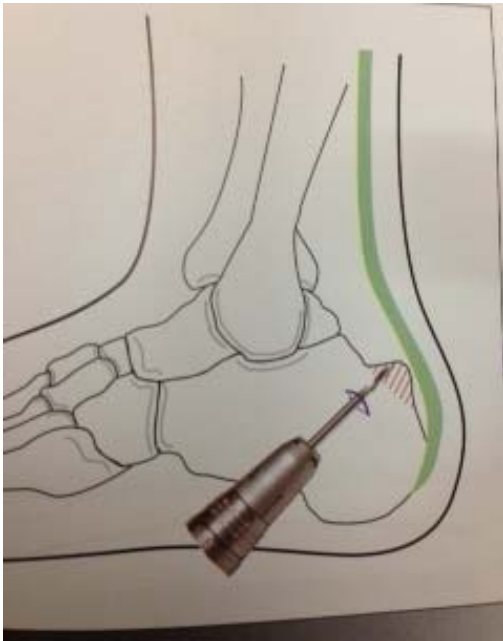
## **PROCEDURE**

Patient is placed in a lateral position, an incision of approximately 1 cm lateral to insertion of Tendo Achilles is made using a surgical blade no.15. Make a stab incision up to sub-periosteal level under image intensifier. Using a mini periosteal elevator just elevate the periosteum around the posterior calcaneal tuberosity.

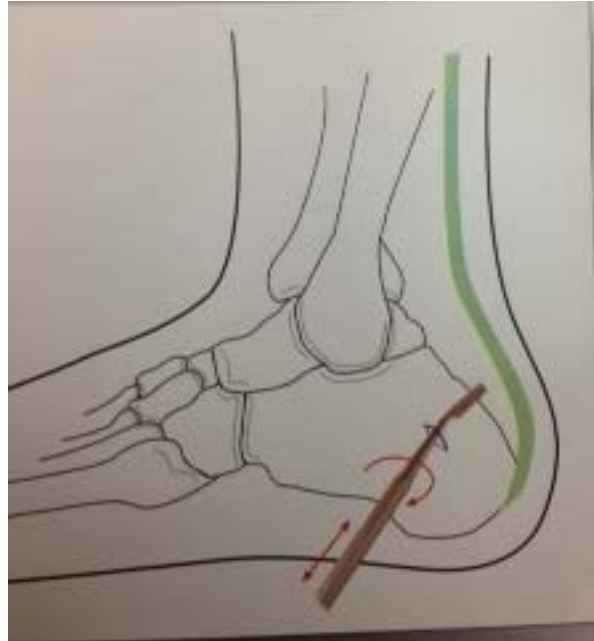


**Incision MIS**

By using the special wedge burr remove the excess bone so as to create enough space between the calcaneus and Tendo Achilles, thus avoiding impingement. Skin closure is done with 3-0 ethilon single stitch.



**Intra-OP MIS**



**Post OP MIS**

**Post-surgery, the patient is allowed to bear weight and walk the same day with special shoes.**

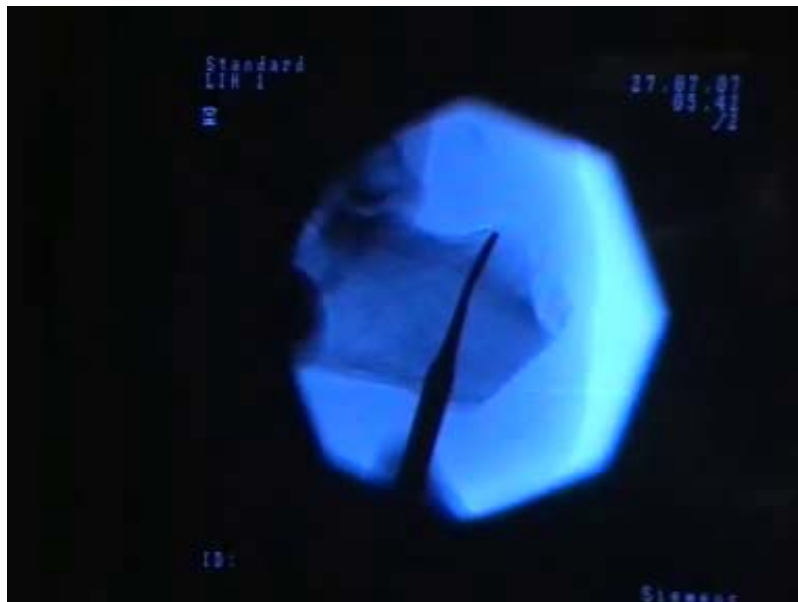


**Image of Haglund Deformity**

**This sort of cases with posterosuperior calcaneal tuberosity without tendonal calcification as given in the above image will be considered for Minimally Invasive Surgical treatment.**



**X-Ray Showing Postero-Superior Calcaneal Tuberosity**



**Image showing Posterosuperior Calcaneal tuberosity**

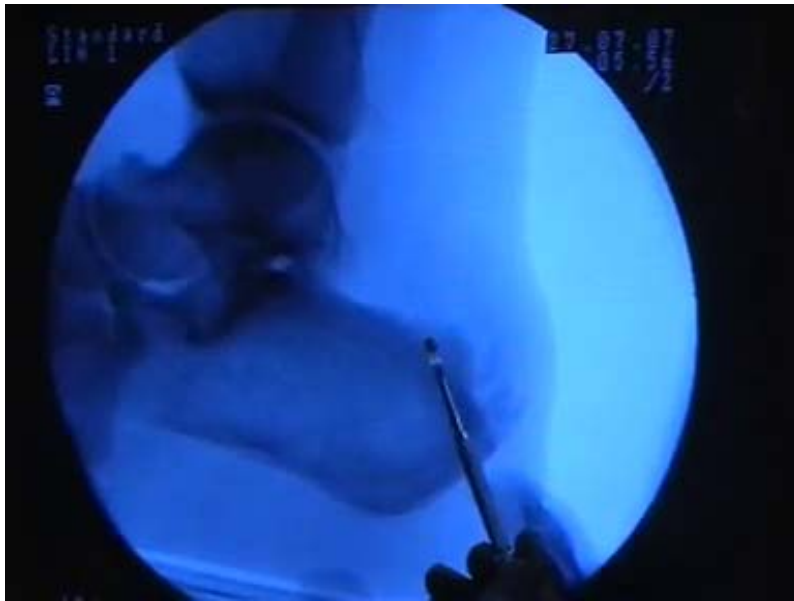


**Retrocalcaneal bursitis**



**Incision made to puncture the Bursa**

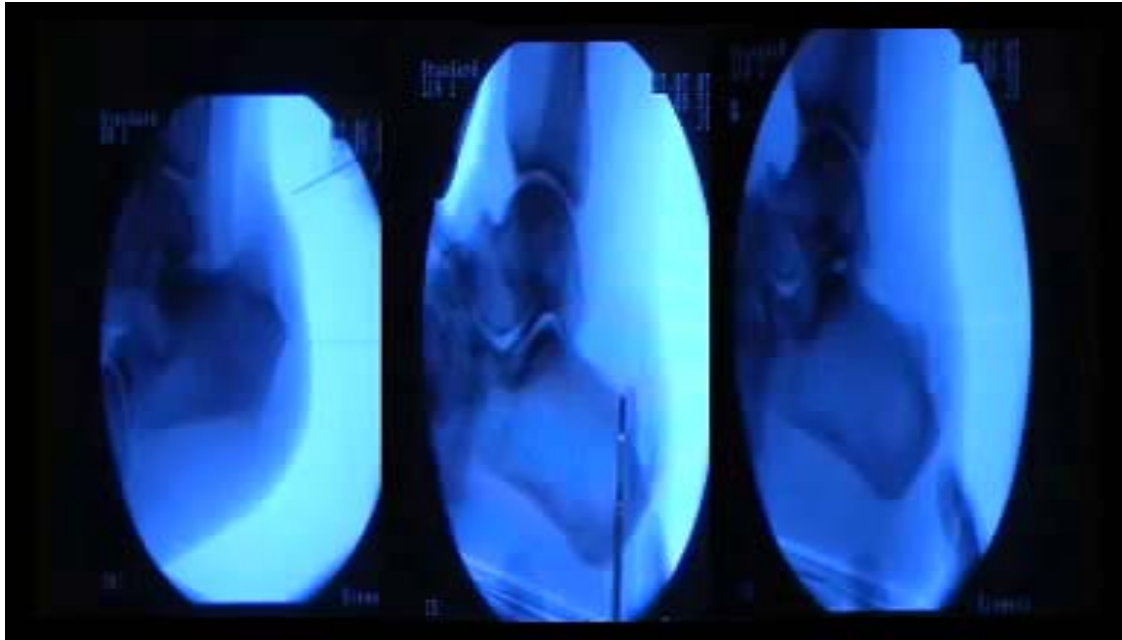




**Totally removed Posterosuperior calcaneal tuberosity post-surgery.**



**(Images From R to L ) 1. Pre-Surgery & 2. Post Surgery**



(Images From L to R ) 1. Prominent Posterosuperior calcaneal tuberosity,  
2. Half removed Posterosuperior calcaneal tuberosity,  
3. Totally removed Posterosuperior calcaneal tuberosity  
post-surgery.

## **2. EXCISION OF HAGLUND'S DEFORMITY BY OPEN TECHNIQUES**

1. The Patient is placed in a prone position under tourniquet control. A longitudinal incision is centered over the lateral margin of the os calcis, extending to a point 1 to 2cm distal to the Achilles tendon insertion. Care must be taken to avoid injury to the sural nerve along the tendon's lateral border.

2. A retractor is used to expose the Achilles tendon, and any inflamed bursa overlying the Achilles tendon, or in the retrocalcaneal area is excised.

3. The calcaneal tuberosity is inspected. If only the lateral tuberosity is enlarged, it is resected. The lateral one third of the Achilles tendon is reflected, exposing the lateral tuberosity.



4. An osteotome is used to excise the lateral tuberosity, and the sharp edges are beveled with a rongeur.



Images showing OPEN SX technique of treating Haglund

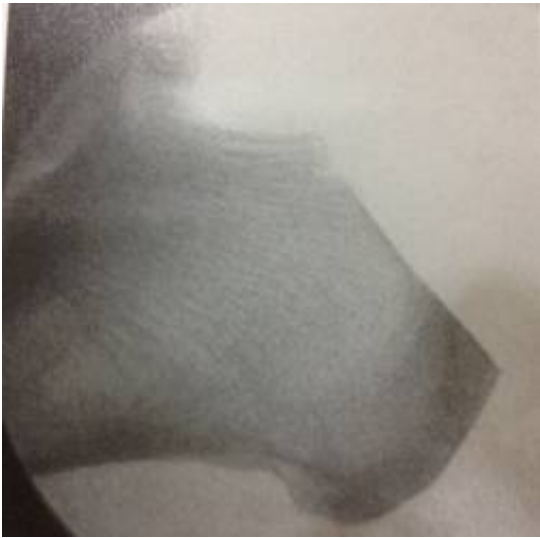
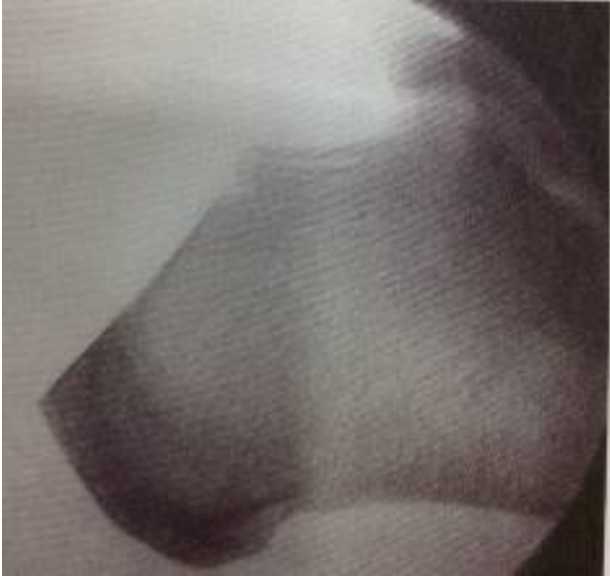


**Image showing Haglund's syndrome with tendonal calcification**

**The Haglund's syndrome with tendonal calcification as shown in the above image will be considered for Open Surgical treatment.**



**X-RAY IMAGE – PRE OP Open SX Treatment**

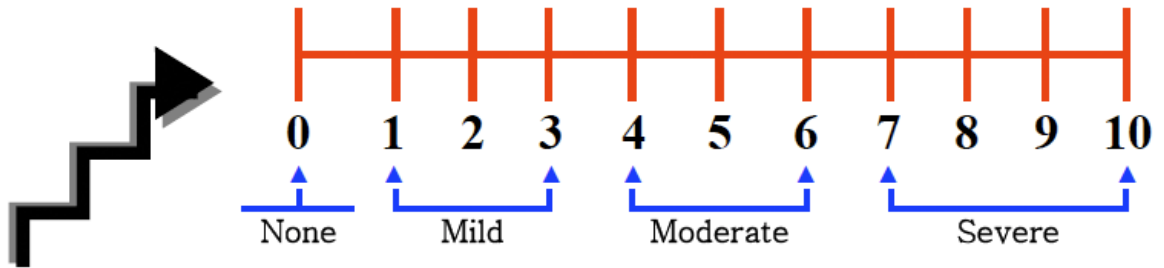


**X-Ray images – Post OP Open SX Treatment**

## **RESULTS**

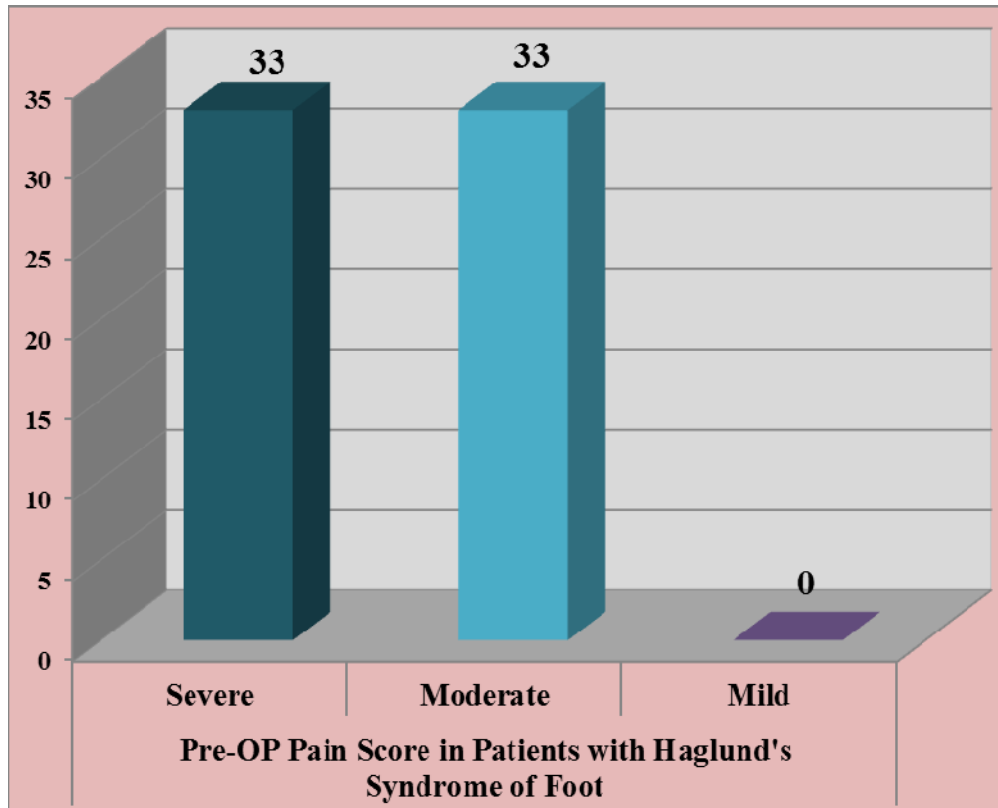
**The below Pain scale is used for assessing the patient's pain after the surgical treatment for a period of 12 Weeks.**

### Numerical Rating Pain Scale



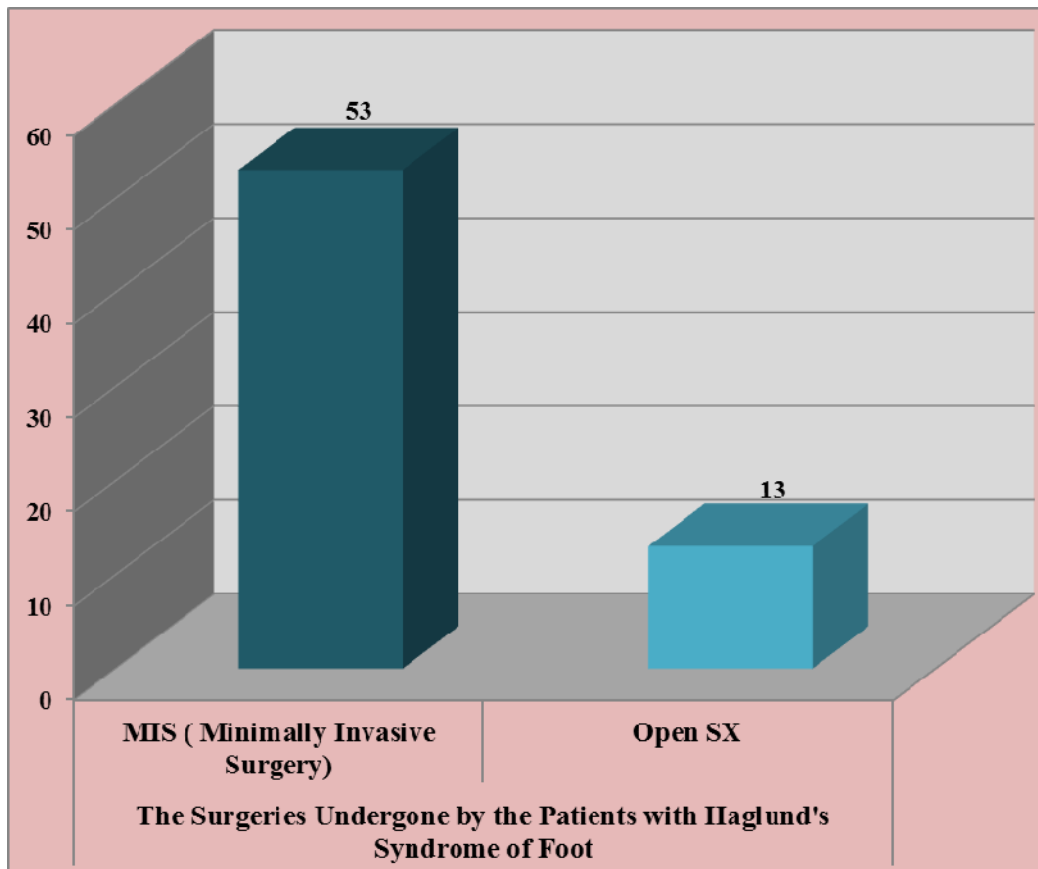
### Pre-OP Pain Score in Patients with Haglund

Pre-OP Pain Score in Patients with Haglund's Syndrome of Foot			
Pain Score	Severe	Moderate	Mild
No. of Patients	33	33	0
% Representation	50 %	50 %	0 %



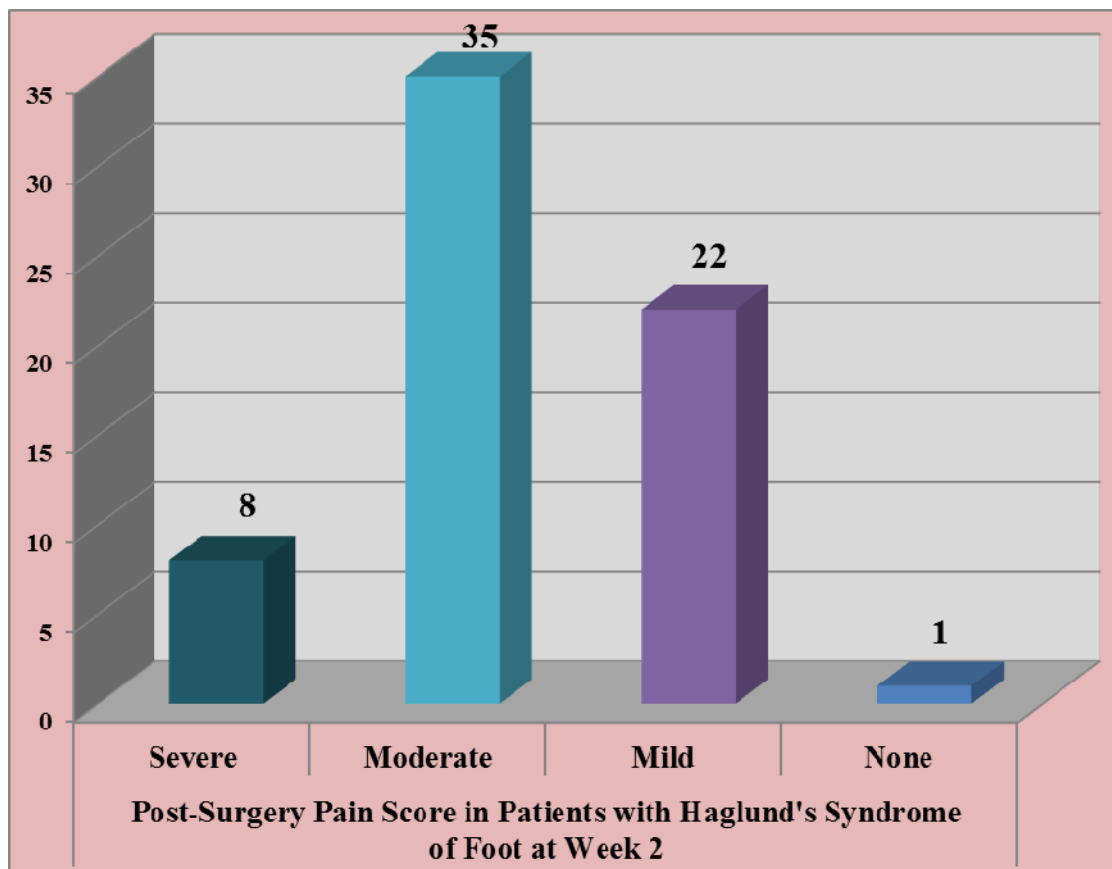
### Surgeries Performed

<b>The Surgeries Undergone by the Patients with Haglund's Syndrome of Foot</b>		
<b>Type of Procedure</b>	<b>MIS ( Minimally Invasive Surgery)</b>	<b>Open SX</b>
<b>No. of Patients</b>	<b>53</b>	<b>13</b>
<b>% Representation</b>	<b>80.3%</b>	<b>19.7%</b>



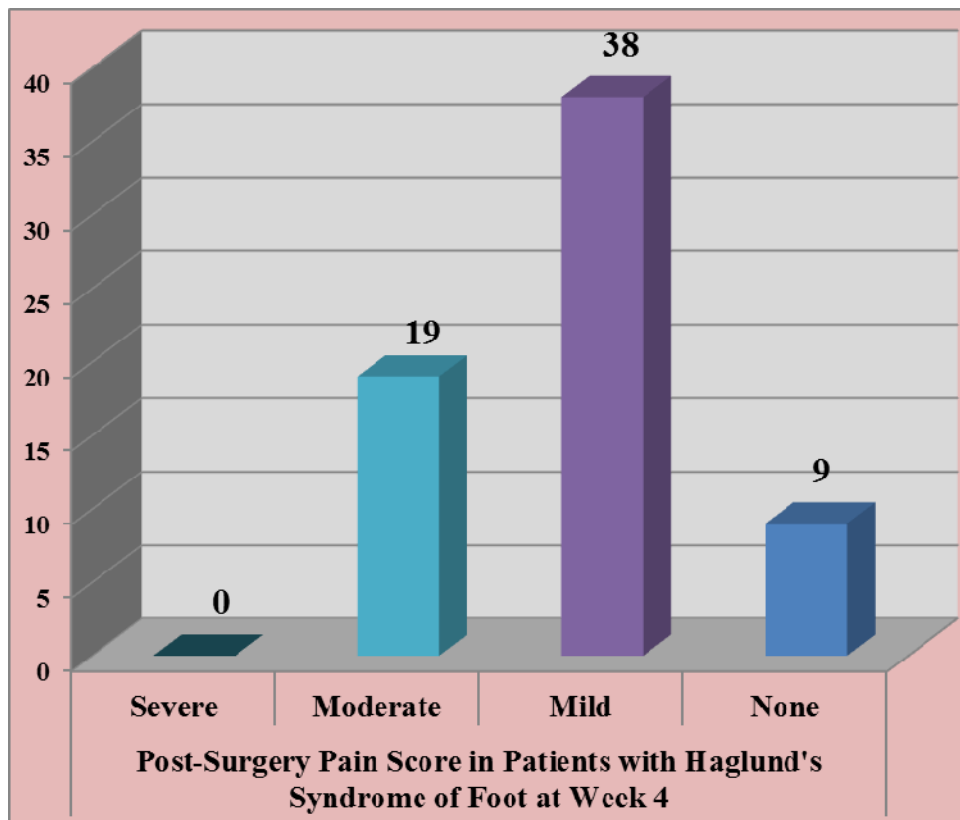
### Post-Surgery Pain Score at Week 2

Post-Surgery Pain Score in Patients with Haglund's Syndrome of Foot at Week 2				
Pain Score	Severe	Moderate	Mild	None
No. of Patients	8	35	22	1
% Representation	12.12%	53%	33.33%	1.51%



### Post-Surgery Pain Score at Week 4

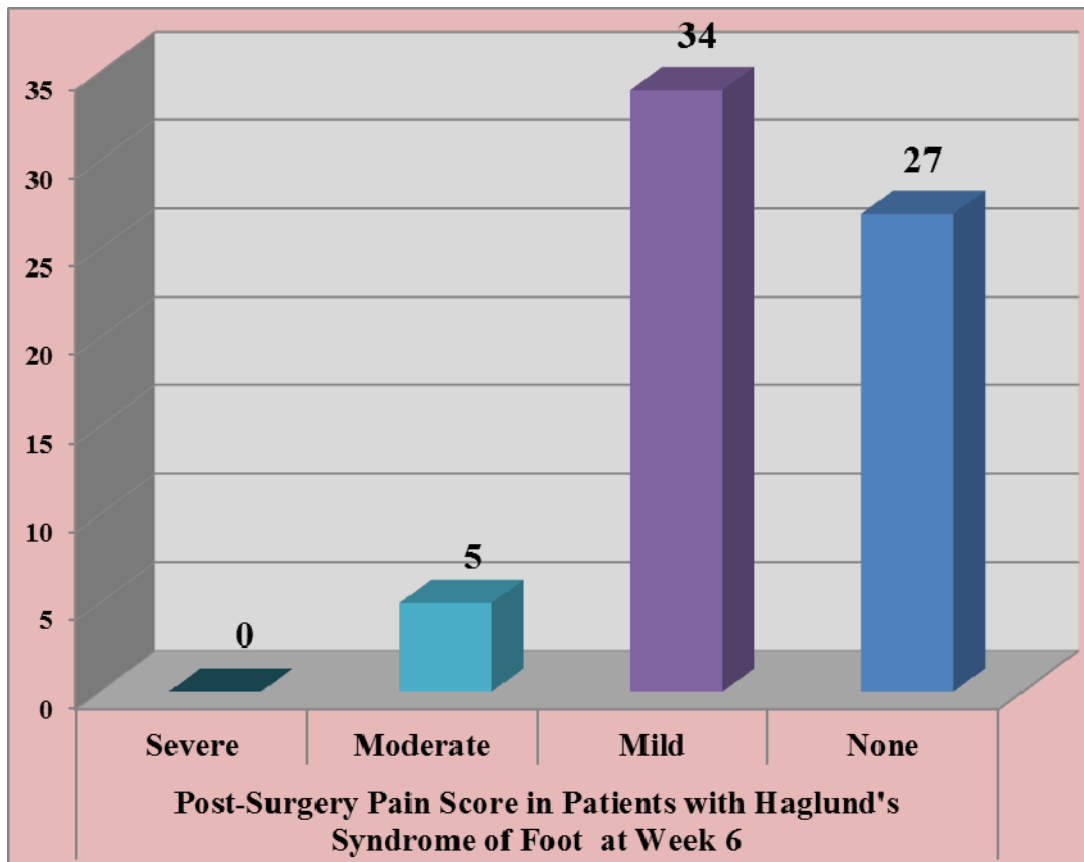
<b>Post-Surgery Pain Score in Patients with Haglund's Syndrome at Week 4</b>				
<b>Pain Score</b>	<b>Severe</b>	<b>Moderate</b>	<b>Mild</b>	<b>None</b>
<b>No. of Patients</b>	<b>0</b>	<b>19</b>	<b>38</b>	<b>9</b>
<b>% Representation</b>	<b>0%</b>	<b>28.8%</b>	<b>57.6%</b>	<b>13.6%</b>



**Post-Surgery Pain Score at Week 6**

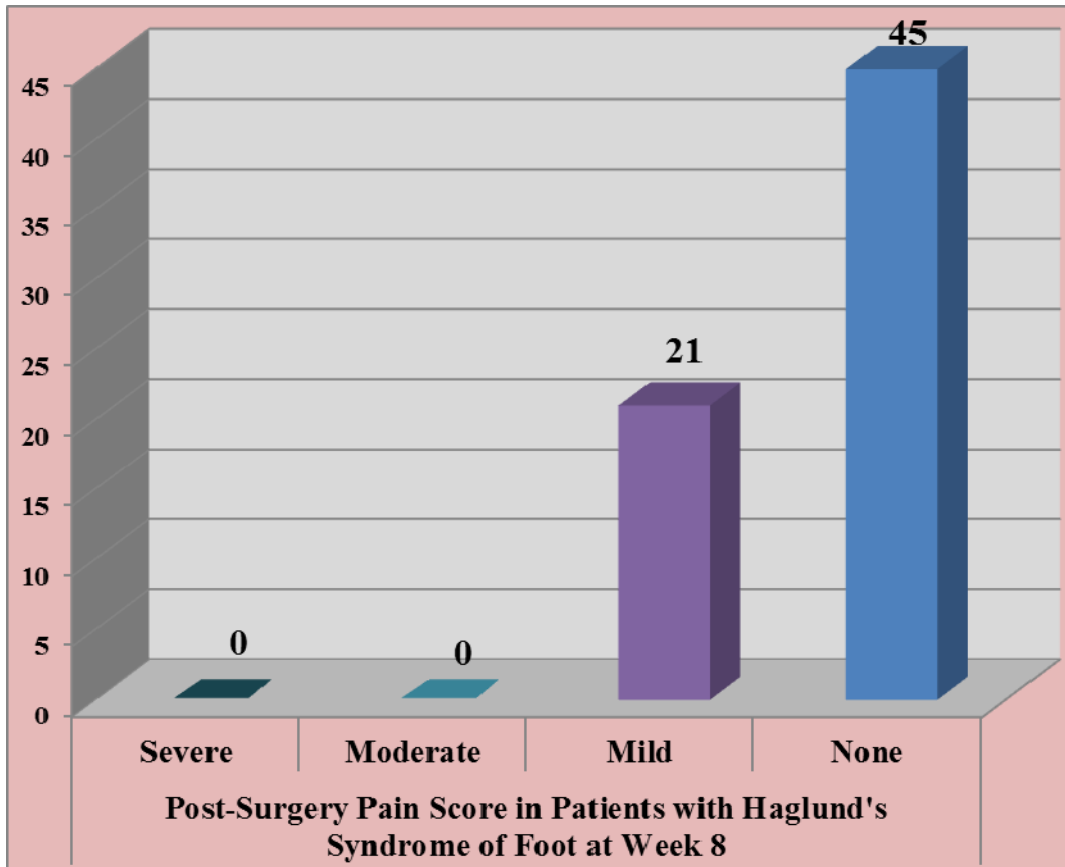
<b>Post-Surgery Pain Score in Patients with Haglund's Syndrome at Week 6</b>				
<b>Pain Score</b>	<b>Severe</b>	<b>Moderate</b>	<b>Mild</b>	<b>None</b>
<b>No. of Patients</b>	<b>0</b>	<b>5</b>	<b>34</b>	<b>27</b>
<b>% Representation</b>	<b>0%</b>	<b>7.6%</b>	<b>51.5%</b>	<b>40.9%</b>





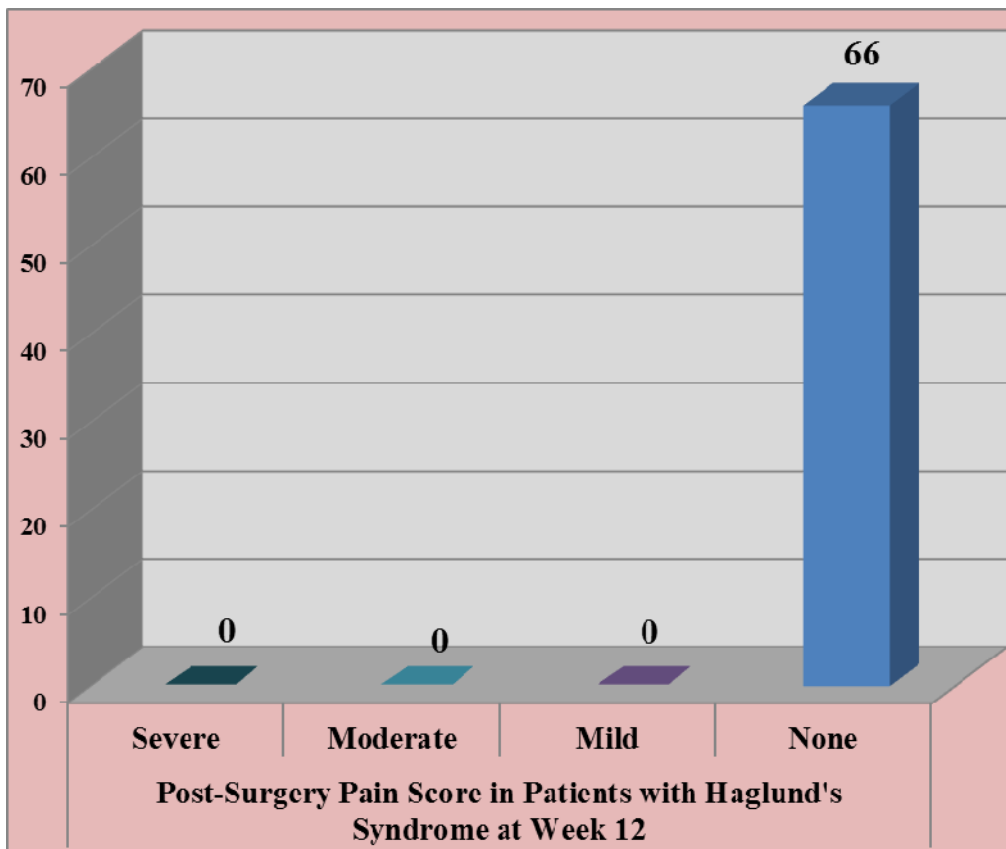
**Post-Surgery Pain Score at Week 8**

<b>Post-Surgery Pain Score in Patients with Haglund's Syndrome at Week 8</b>				
<b>Pain Score</b>	<b>Severe</b>	<b>Moderate</b>	<b>Mild</b>	<b>None</b>
<b>No. of Patients</b>	0	0	21	45
<b>% Representation</b>	0%	0%	31.8%	68.2 %



**Post-Surgery Pain Score at Week 12**

<b>Post-Surgery Pain Score in Patients with Haglund's Syndrome at Week 12</b>				
<b>Pain Score</b>	<b>Severe</b>	<b>Moderate</b>	<b>Mild</b>	<b>None</b>
<b>No. of Patients</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>66</b>
<b>% Representation</b>	<b>0%</b>	<b>0%</b>	<b>0%</b>	<b>100 %</b>



## MATERIALS AND METHODS

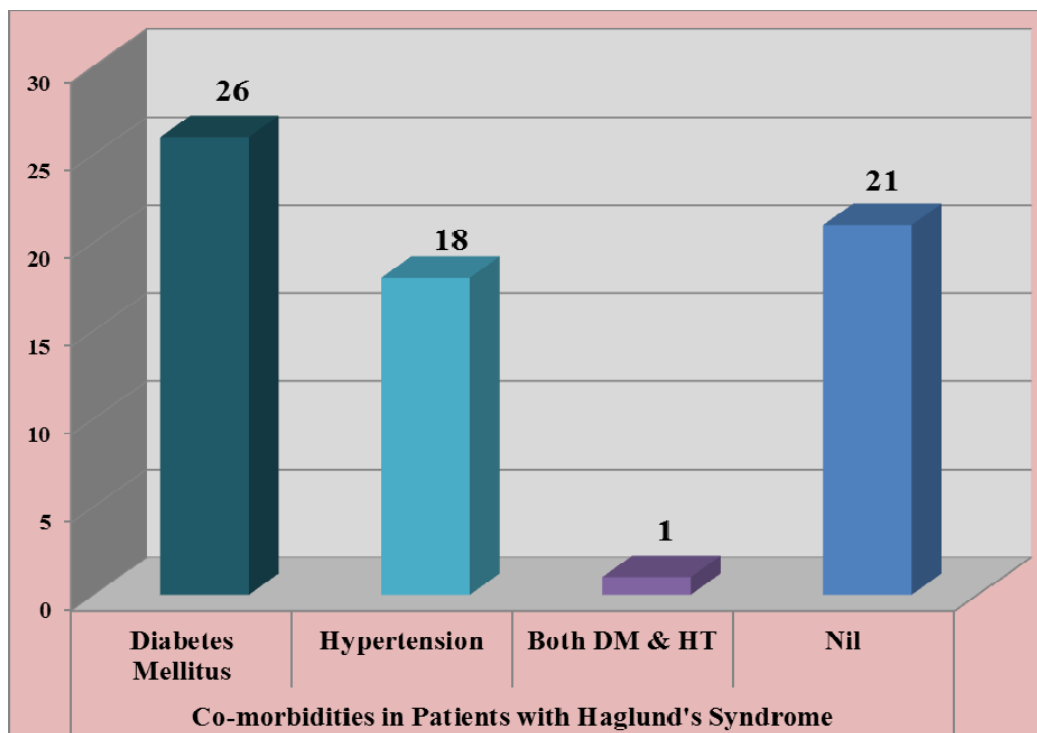
Patients with chronic Haglund's disease of the foot with instability who had undergone surgical correction at VISA Hospital Foot Clinic during the period June 2008 to November 2012, were taken up for the study. 66 patients satisfied the above criteria.

All patients were primarily treated with conservative methods for a period of 6 weeks ,who did not respond for treatment and still had pain were taken up for surgical management.

Amongst the 66 patients, 26 patients (39.4 % of patients) were Diabetic, 18 patients (27.3 % of patients) were Hypertensive, 1 patient (1.5 % of patients) had both the co-morbidities (DM & HT) and 21 patients (31.8 % of patients) had no co-morbidities. The graphical representation of the same is as follows,

### Co-morbidities in Patients with Haglund's Syndrome

Co-morbidities	Diabetes Mellitus	Hypertension	Both DM & HT	Nil
No. of Patients	26	18	1	21
% Representation	39.4%	27.3%	1.5%	31.8%



**Patient No.1:S.B, 29 years Female (11.6.2008), had severe pain in her right heel. She underwent an MIS procedure for right haglund. She recovered well post-surgery, Pain became moderate in 4 weeks and gradually reduced.**

**Patient No.2:V.K, 25 years Male (13.6.2008), had moderate pain in his left heel. He developed a Posterosuperior calcaneal tuberosity of his left heel. He underwent an Open surgery with haglund resection & excision of calcification. Pain became moderate in 4 weeks and gradually reduced.**

**Patient No.3:G.I, 84 years Female (14.6.2008), had severe pain in her right heel. She developed a Posterosuperior calcaneal tuberosity of her right heel. The tuberosity was removed totally by Minimally Invasive Surgical procedure .She recovered well post-surgery, Pain became mild in 2 weeks and gradually reduced.**

**Patient No.4:V.S, 61 years Female (26.6.2008), had moderate pain in her left heel. She underwent an MIS procedure for left haglund. She recovered well post-surgery, Pain became moderate in 2 weeks and gradually reduced.**

**Patient No.5:K.R, 59 years Male (24.7.2008), had moderate pain in his right heel. He underwent an MIS procedure for right haglund. He recovered well post-surgery, Pain became moderate in 4 weeks and gradually reduced.**

**Patient No.6:V.R, 29 years Male (20.7.2008), had severe pain in his left heel. He underwent an MIS procedure for left haglund. He recovered well post-surgery, pain became mild in 4 weeks and gradually reduced.**

**Patient No.7:D.R, 49 years Male (11.8.2008), had severe pain in his right heel. He underwent an Open surgery with haglund resection & excision of calcification. Pain became moderate in 4 weeks and gradually reduced.**

**Patient No.8:K.L, 29 years Male (27.8.2008), had severe pain in his left heel. He underwent an MIS procedure for left haglund. He recovered well post-surgery, Pain became mild in 4 weeks and gradually reduced.**

**Patient No.9:J.C, 50 years Male (24.9.2008), had moderate pain in his left heel. He underwent an MIS procedure for left haglund. He recovered well post-surgery, Pain became mild in 2 weeks and gradually reduced.**

**Patient No.10:A.S, 63 years Male (7.10.2008), had moderate pain in his right heel. He underwent an MIS procedure for right haglund. He recovered well post-surgery, Pain became mild in 4 weeks and gradually reduced.**

**Patient No.11:G.K, 65 years Male (14.7.2008), had moderate pain in his left heel. He underwent an MIS procedure for left haglund. He recovered well post-surgery, Pain became mild in 2 weeks and gradually reduced.**

**Patient No.12:R.T, 20 years Male (30.10.2008), had moderate pain in his left heel. He underwent an MIS procedure for left haglund. He recovered well post-surgery, Pain became moderate in 2 weeks and gradually reduced.**

**Patient No.13:Y.M, 60 years Male (10.12.2008), had severe pain in his right heel. He underwent an MIS procedure for right haglund. He recovered well post-surgery, Pain became moderate in 4 weeks and gradually reduced.**

**Patient No.14:C.V, 60 years Female (12.12.2008), had severe pain in her right heel. She underwent an Open surgery with haglund resection& excision of calcification. Pain became moderate in 4 weeks and gradually reduced.**

**Patient No.15:V.S, 60 years Male (10.12.2008), HT & DM had moderate pain in his left heel. He underwent an MIS procedure for left haglund. He recovered well post-surgery, Pain became moderate in 2 weeks and gradually reduced.**

**Patient No.16:M.M, 52 years Male (6.1.2009), DM had severe pain in his left heel. He underwent an MIS procedure for left haglund. He recovered well post-surgery, Pain became moderate in 2 weeks and gradually reduced.**

**Patient No.17:P.V, 52 years Male (19.1.2009), DM had moderate pain in his right heel. He underwent an MIS procedure for right haglund. He recovered well post-surgery, Pain became moderate in 2 weeks and gradually reduced.**

**Patient No.18:L.K, 63 years Female (7.3.2009), HT had moderate pain in her right heel. She underwent an MIS procedure for right haglund. She recovered well post-surgery, Pain became mild in 2 weeks and gradually reduced.**

**Patient No.19:L.D, 47 years Female (8.4.2009), DM had severe pain in her right heel. She underwent an MIS procedure for right haglund. She recovered well post-surgery, Pain became moderate in 4 weeks and gradually reduced.**

**Patient No.20:M.S, 56 years Male (20.4.2009), had severe pain in his left heel. He underwent an MIS procedure for left haglund. He recovered well post-surgery, Pain became moderate in 2 weeks and gradually reduced.**

**Patient No.21:S.K, 58 years Male (28.5.2009), HT had severe pain in his right heel. He underwent an MIS procedure for right haglund. He recovered well post-surgery, Pain became moderate in 4 weeks and gradually reduced.**

**Patient No.22:R.S, 63 years Female (28.5.2009), DM had moderate pain in her right heel. She underwent an MIS procedure for right haglund. She recovered well post-surgery, Pain became mild in 2 weeks and gradually reduced.**

**Patient No.23:N.R, 53 years Male (10.6.2009), DM had moderate pain in his left heel. He underwent an MIS procedure for left haglund. He recovered well post-surgery, Pain became moderate in 2 weeks and gradually reduced.**

**Patient No.24:S.R,50 years Male (18.6.2009), HT had moderate pain in his right heel. He underwent an Open surgery with haglund resection & excision of calcification. Pain became mild in 2 weeks and gradually reduced.**

**Patient No.25:V.R, 84 years Male (26.6.2009), HT had moderate pain in his right heel. He underwent an MIS procedure for right haglund. He recovered well post-surgery, Pain became moderate in 2 weeks and gradually reduced.**

**Patient No.26:R.J, 40 years Female (24.8.2009), HT had moderate pain in her left heel. She underwent an MIS procedure for left haglund. She recovered well post-surgery, Pain became mild in 2 weeks and gradually reduced.**

**Patient No.27:V.R, 83 years Male (31.10.2009), DM had moderate pain in his left heel. He underwent an MIS procedure for left haglund. He recovered well post-surgery, Pain became moderate in 2 weeks and gradually reduced.**

**Patient No.28:Y.K, 50 years Male (4.12.2009), had moderate pain in his left heel. He underwent an MIS procedure for left haglund. He recovered well post-surgery, Pain became moderate in 2 weeks and gradually reduced.**

**Patient No.29:S.M, 46 years Female (14.12.2009), DM had moderate pain in her left heel. She underwent an MIS procedure for left haglund. She recovered well post-surgery, Pain became mild in 2 weeks and gradually reduced.**

**Patient No.30:V.R, 44 years Male (18.12.2009), HT had moderate pain in his right heel. He underwent an MIS procedure for right haglund. He recovered well post-surgery, Pain became mild in 2 weeks and gradually reduced.**

**Patient No.31:S.K, 47 years Female (27.1.2010), DM had severe pain in her left heel. She underwent an Open surgery with haglund resection & excision of calcification. Pain became moderate in 4 weeks and gradually reduced.**

**Patient No.32:S.N, 47 years Male (28.1.2010), HT had moderate pain in his left heel. He underwent an MIS procedure for left haglund. He recovered well post-surgery, Pain became moderate in 2 weeks and gradually reduced.**

**Patient No.33:D.K, 55 years Male (30.1.2010), DM had severe pain in his left heel. He underwent an Open surgery with haglund resection & excision of calcification. Pain became moderate in 2 weeks and gradually reduced.**

**Patient No.34:R.J, 50 years Female (5.2.2010), HT had moderate pain in her left heel. She underwent an MIS procedure for left haglund. She recovered well post-surgery, Pain became moderate in 2 weeks and gradually reduced.**

**Patient No.35:M.R, 50 years Male (12.2.2010), DM had severe pain in his left heel. He underwent an MIS procedure for left haglund. He recovered well post-surgery, Pain became moderate in 2 weeks and gradually reduced.**

**Patient No.36:A.R, 44 years Male (17.2.2010), HT had severe pain in his right heel. He underwent an Open surgery with haglund resection & excision of calcification. Pain became moderate in 2 weeks and gradually reduced.**

**Patient No.37:K.S, 17 years Female(12.3.2010), had moderate pain in her left heel. She underwent an MIS procedure for left haglund. She recovered well post-surgery, Pain became moderate in 2 weeks and gradually reduced.**

**Patient No.38:M.T, 52 years Male (27.3.2010), DM had moderate pain in his left heel. He underwent an MIS procedure for left haglund. He recovered well post-surgery, Pain became mild in 2 weeks and gradually reduced.**

**Patient No.39:U.R,54 years Female (13.4.2010), had severe pain in her left heel. She underwent an Open surgery with haglund resection & excision of calcification. Pain became moderate in 2 weeks and gradually reduced.**

**Patient No.40:M.R, 50 years Female (20.4.2010), DM had moderate pain in her right heel. She underwent an MIS procedure for right haglund. She recovered well post-surgery, Pain became moderate in 2 weeks and gradually reduced.**

**Patient No.41:S.H, 42 years Male (20.4.2010), DM had severe pain in his left heel. He underwent an Open surgery with haglund resection& excision of calcification. Pain became moderate in 4 weeks and gradually reduced.**

**Patient No.42:G.L, 50 years Female(8.5.2010), HT had moderate pain in her right heel. She underwent an MIS procedure for right haglund. She recovered well post-surgery, Pain became mild in 2 weeks and gradually reduced.**

**Patient No.43:H.B, 40 years Female (8.5.2010), HT had severe pain in her right heel. She underwent an MIS procedure for right haglund. She recovered well post-surgery, Pain became moderate in 2 weeks and gradually reduced.**

**Patient No.44:S.R, 51 years Male (18.5.2010), DM had moderate pain in his left heel. He underwent an MIS procedure for left haglund. He recovered well post-surgery, Pain became mild in 2 weeks and gradually reduced.**

**Patient No.45:S.K, 70 years Male (17.6.2010), HT had severe pain in his left heel. He underwent an MIS procedure for left haglund. He recovered well post-surgery, Pain became moderate in 2 weeks and gradually reduced.**

**Patient No.46:R.N, 58 years Male (21.6.2010), DM had severe pain in his left heel. He underwent an MIS procedure for left haglund. He recovered well post-surgery, Pain became moderate in 2 weeks and gradually reduced.**

**Patient No.47:P.V, 44 years Female (24.6.2010), DM had moderate pain in her left heel. She underwent an Open surgery with haglund resection & excision of calcification. Pain became mild in 2 weeks and gradually reduced.**

**Patient No.48:B.S, 53 years Male (27.7.2010), HT had moderate pain in his left heel. He underwent an MIS procedure for left haglund. He recovered well post-surgery, Pain became moderate in 2 weeks and gradually reduced.**



**Patient No.49:N.S, 67 years Male (29.7.2010), had moderate pain in his right heel. He underwent an MIS procedure for right haglund. He recovered well post-surgery, Pain became moderate in 2 weeks and gradually reduced.**

**Patient No.50:B.S, 62 years Male (4.8.2010), DM had severe pain in his right heel. He underwent an MIS procedure for right haglund. He recovered well post-surgery, Pain became moderate in 2 weeks and gradually reduced.**

**Patient No.51:D.P, 45 years Male (10.8.2010), HT had moderate pain in his right heel. He underwent an MIS procedure for right haglund. He recovered well post-surgery, Pain became mild in 2 weeks and gradually reduced.**

**Patient No.52:E.D, 45 years Female (13.8.2010), DM had severe pain in her right heel. She underwent an MIS procedure for right haglund. She recovered well post-surgery, Pain became moderate in 2 weeks and gradually reduced.**

**Patient No.53:V.S, 51 years Male (23.11.2010), HT had severe pain in his left heel. He underwent an MIS procedure for left haglund. He recovered well post-surgery, Pain became moderate in 2 weeks and gradually reduced.**

**Patient No.54:G.L, 33 years Female (20.4.2011), DM had moderate pain in her right heel. She underwent an MIS procedure for right haglund. She recovered well post-surgery, Pain became mild in 2 weeks and gradually reduced.**

**Patient No.55:S.M, 59 years Male (29.6.2011), had moderate pain in his left heel. He underwent an Open surgery with haglund resection& excision of calcification. Pain became moderate in 2 weeks and gradually reduced.**

**Patient No.56:N.K, 84 years Male (16.7.2011), DM had severe pain in his right heel. He underwent an MIS procedure for right haglund. He recovered well post-surgery, Pain became moderate in 2 weeks and gradually reduced.**

**Patient No.57:V.C, 61 years Male (6.8.2011), DM had severe pain in his right heel. He underwent an MIS procedure for right haglund. He recovered well post-surgery, Pain became moderate in 2 weeks and gradually reduced.**

**Patient No.58:D.M, 42 years Female (20.4.2011), HT had moderate pain in her left heel. She underwent an MIS procedure for left haglund. She recovered well post-surgery, Pain became mild in 2 weeks and gradually reduced.**

**Patient No.59:S.S, 45 years Female (4.11.2011), DM had moderate pain in her right heel. She underwent an Open surgery with haglund resection & excision of calcification. Pain became mild in 2 weeks and gradually reduced.**

**Patient No.60:S.R, 65 years Male (21.2.2012), DM had moderate pain in his left heel.**

He underwent an MIS procedure for left haglund. He recovered well post-surgery, Pain became mild in 2 weeks and gradually reduced.

Patient No.61:K.V, 48 years Female (6.4.2012), DM had moderate pain in her right heel. She underwent an MIS procedure for right haglund. She recovered well post-surgery, Pain became mild in 4 weeks and gradually reduced.

Patient No.62:P.S, 51 years Male (5.5.2012), HT had severe pain in his right heel. He underwent an MIS procedure for right haglund. He recovered well post-surgery, Pain became mild in 2 weeks and gradually reduced.

Patient No.63:A.P, 25 years Male (2.6.2012), DM had moderate pain in his left heel. He underwent an MIS procedure for left haglund. He recovered well post-surgery, Pain became moderate in 2 weeks and gradually reduced.

Patient No.64:M.B, 62 years Female (20.9.2012), DM had moderate pain in her right heel. She underwent an Open surgery with haglund resection & excision of calcification. Pain became mild in 2 weeks and gradually reduced.

Patient No.65:V.L, 51 years Female (15.10.2012), HT had moderate pain in her left heel. She underwent an MIS procedure for left haglund. She recovered well post-surgery, Pain became mild in 2 weeks and gradually reduced.

Patient No.66:N.R, 56 years Male (22.11.2012), had moderate pain in his right heel. He underwent an MIS procedure for right haglund. He recovered well post-surgery, Pain became mild in 2 weeks and gradually reduced.

## OUTCOMES

Of the sixty six patients operated, Post OP pain score is as follows:

Patient No	SURGERY	PRE OP PAIN SCORE	POST OP PAIN SCORE				
			2 WEEKS	4 WEEKS	6 WEEKS	8 WEEKS	12 WEEKS
1	MIS	SEVERE	SEVERE	MODERATE	MODERATE	MILD	NONE
2	OPEN SX	MODERATE	SEVERE	MODERATE	MILD	MILD	NONE
3	MIS	SEVERE	MILD	MILD	NONE	NONE	NONE
4	MIS	MODERATE	MODERATE	MODERATE	MILD	NONE	NONE
5	MIS	MODERATE	MODERATE	NONE	NONE	NONE	NONE
6	MIS	SEVERE	MODERATE	MILD	NONE	NONE	NONE
7	OPEN SX	SEVERE	SEVERE	MODERATE	MODERATE	MILD	NONE
8	MIS	SEVERE	MODERATE	MODERATE	MILD	MILD	NONE

9	MIS	MODERATE	MILD	MILD	MILD	NONE	NONE
10	MIS	MODERATE	MODERATE	MILD	MILD	NONE	NONE
11	MIS	MODERATE	MILD	MILD	NONE	NONE	NONE
12	MIS	MODERATE	MODERATE	MILD	MILD	MILD	NONE
13	MIS	SEVERE	SEVERE	MODERATE	MODERATE	MILD	NONE
14	OPEN SX	SEVERE	SEVERE	MODERATE	MILD	MILD	NONE
15	MIS	MODERATE	MODERATE	MILD	MILD	NONE	NONE
16	MIS	SEVERE	MODERATE	MODERATE	MILD	MILD	NONE
17	MIS	MODERATE	MODERATE	MILD	MILD	NONE	NONE
18	MIS	MODERATE	MILD	MILD	NONE	NONE	NONE
19	MIS	SEVERE	SEVERE	MODERATE	MODERATE	MILD	NONE
20	MIS	SEVERE	MODERATE	MODERATE	MILD	NONE	NONE
21	MIS	SEVERE	SEVERE	MODERATE	MILD	MILD	NONE
22	MIS	MODERATE	MILD	MILD	NONE	NONE	NONE
23	MIS	MODERATE	MODERATE	MILD	MILD	NONE	NONE
24	OPEN SX	MODERATE	MILD	MILD	MILD	NONE	NONE
25	MIS	MODERATE	MODERATE	MILD	NONE	NONE	NONE
26	MIS	MODERATE	MILD	MILD	NONE	NONE	NONE
27	MIS	MODERATE	MODERATE	MODERATE	MILD	MILD	NONE
28	MIS	MODERATE	MODERATE	MILD	NONE	NONE	NONE
29	MIS	MODERATE	MILD	MILD	NONE	NONE	NONE
30	MIS	MODERATE	MILD	MILD	MILD	NONE	NONE
31	OPEN SX	SEVERE	SEVERE	MODERATE	MODERATE	MILD	NONE
32	MIS	MODERATE	MODERATE	MILD	MILD	NONE	NONE
33	OPEN SX	SEVERE	MODERATE	MILD	MILD	MILD	NONE
34	MIS	MODERATE	MODERATE	MILD	MILD	NONE	NONE
35	MIS	SEVERE	MODERATE	MODERATE	MILD	MILD	NONE
36	OPEN SX	SEVERE	MODERATE	MILD	MILD	NONE	NONE
37	MIS	MODERATE	MODERATE	MILD	NONE	NONE	NONE
38	MIS	MODERATE	MILD	NONE	NONE	NONE	NONE
39	OPEN SX	SEVERE	MODERATE	MODERATE	MILD	MILD	NONE
40	MIS	MODERATE	MODERATE	MILD	MILD	NONE	NONE
41	OPEN SX	SEVERE	MODERATE	MODERATE	MILD	MILD	NONE
42	MIS	MODERATE	MILD	MILD	MILD	MILD	NONE
43	MIS	SEVERE	MODERATE	MODERATE	MILD	MILD	NONE
44	MIS	MODERATE	MILD	MILD	NONE	NONE	NONE
45	MIS	SEVERE	MODERATE	MILD	MILD	NONE	NONE
46	MIS	SEVERE	MODERATE	MILD	NONE	NONE	NONE
47	OPEN SX	MODERATE	MILD	NONE	NONE	NONE	NONE
48	MIS	MODERATE	MODERATE	MILD	MILD	NONE	NONE
49	MIS	MODERATE	MODERATE	MILD	NONE	NONE	NONE

50	MIS	SEVERE	MODERATE	MODERATE	MILD	MILD	NONE
51	MIS	MODERATE	MILD	MILD	NONE	NONE	NONE
52	MIS	SEVERE	MODERATE	MILD	MILD	MILD	NONE
53	MIS	SEVERE	MODERATE	MILD	MILD	NONE	NONE
54	MIS	MODERATE	MILD	NONE	NONE	NONE	NONE
55	OPEN SX	MODERATE	MODERATE	MILD	MILD	NONE	NONE
56	MIS	SEVERE	MODERATE	MILD	MILD	NONE	NONE
57	MIS	SEVERE	MODERATE	MILD	MILD	MILD	NONE
58	MIS	MODERATE	MILD	NONE	NONE	NONE	NONE
59	OPEN SX	MODERATE	MILD	NONE	NONE	NONE	NONE
60	MIS	MODERATE	MILD	MILD	NONE	NONE	NONE
61	MIS	MODERATE	MODERATE	MILD	NONE	NONE	NONE
62	MIS	MODERATE	MILD	NONE	NONE	NONE	NONE
63	MIS	MODERATE	MODERATE	MILD	NONE	NONE	NONE
64	OPEN SX	MODERATE	MILD	MILD	MILD	NONE	NONE
65	MIS	MODERATE	MILD	NONE	NONE	NONE	NONE
66	MIS	MODERATE	MILD	NONE	NONE	NONE	NONE

## ANALYSIS

Of the sixty six patients operated, 80.3% (53 Patients) of patients had undergone MIS procedure whereas 19.7%(13 Patients) of patients had undergone Open SX Procedure. All the 66 patients were followed-up for the post-surgery pain score for a period of 12 weeks. All the patients were completely recovered from pain in a span of 12 weeks which is evident from their pain score of 0 (Zero) at week 12.

Moreover, 68.2 % of patients were completely recovered from pain in just 8 weeks and the rest 31.8% had mild pain at Week 8 which may be due to the associated co-morbidities – DM & HT in those patients.

At week 6, very remarkably 40.9%(27 patients) of patients have had 0(Zero) pain score whereas 51.5%(34 Patients) & 7.6%(5 Patients) of patients have had mild & moderate pain scores respectively.

At week 4, 13.6%(9 patients) of patients have had very early recovery from pain with a 0(Zero) pain score whereas 57.6%(38 Patients) & 28.8%(19 Patients) of patients have had mild & moderate pain scores respectively.

At week 2, 1.51%(1 patient) of patients have had a very early recovery from pain with a 0(Zero) pain score whereas 33%(22 Patients), 53%(35 Patients) & 12.1%(8 Patients) of patients have had mild, moderate & severe pain scores respectively.

These outcomes shows very favorable results for Minimally Invasive Surgical Procedure in the recovery of patients operated for Haglund's disease, when compared to that with Open Surgical methods.

## **DISCUSSION**

Clinical and Post surgery data were analyzed for 66 surgical interventions of painful Haglund's syndrome of foot with a mean follow-up of 12 Weeks. Amongst 66 patients the surgical procedure consisted of MIS (Minimally Invasive Surgery) & Open SX procedure of postero-superior portion of the calcaneus for 53 & 13 patients respectively. The clinical evaluation showed satisfactory results with complete relief of pain & discomfort in all the 66 patients over the period of 12 weeks. The time course of rehabilitation was very short with an average of 8 to 12 weeks after surgery with a complete relief from pain.

The retrocalcaneal pain can be because of

- 1.Retrocalcaneal Bursitis
- 2.Haglunds deformity
- 3.insertional tendonitis
- 4.Tendinopathy

1&2 can be treated by MIS surgery

3&4 cannot be treated by MIS surgery,selection of cases is very important for yielding good results.

Some pts may require reinsertion of tendo Achilles after debridment, certain cases will also require a V Y Plasty

## **CONCLUSIONS AND RECOMMENDATIONS**

Haglund's disease of foot is becoming a larger clinical problem due to the increased incidence of diabetes and hypertension & usage of bad footwear. As the problem has become more aware to Orthopaedic Foot and Ankle surgeons, the interest of treating Haglund's syndrome of foot by Minimally Invasive Surgery has become a recent trend, because the surgery performed whether by MIS or Open, must remove enough bone to prevent impingement, between the calcaneus and Achilles tendon. MIS has demonstrated to show several advantages including,

1. Low Morbidity,
2. Functional after treatment,

3. Out Patient treatment,
4. Excellent Scar Healing &
5. Short recovery time, as compared with the results of the OPEN technique

We recommend from our study of 66 patients that MIS technique is very advanced in treating surgically the patients with Haglund's syndrome due to various advantages such as,

1. Incision is very small,
2. Can be performed under local anesthesia,
3. Getting back to normalcy at a very short period of time after surgery,
4. Procedure can normally be performed as an OP procedure.

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