Haglund's Excision: Our Novel Technique

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Abstract

Introduction: Haglund's deformity is one of the commonly encountered entities in day-to-day clinical practice. Haglund's deformity is a posterosuperior prominence of the calcaneal tuberosity, it is also known as pump bump or retrocalcaneal bursitis. People who do not respond to the conservative trial may need surgical excision. Partial calcaneal osteotomy is an accepted surgical treatment for Haglund's deformity. This partial excision may predispose to tendoachilles rupture if intraoperatively, the tendoachilles is injured during the calcaneal osteotomy.

Materials and Methods: Here, we propose our technique of calcaneal osteotomy with the lateral approach minimizing the injury to tendoachilles and also the post-surgical clinical outcome in 28 patients and 30 feet. All the patients were followed up till 1 year of post-operative period and the clinical outcome was analyzed using ankle-hindfoot scale.

Results: The average pre-operative visual analog scale was noted to be 7/10 and the post-operative average visual analog was noted to be 3/10. The average pre-operative ankle-hindfoot scale was 66/100 and the average 1-year post-operative ankle-hindfoot scale was noted to be 87/100. Majority of the patients were asymptomatic at the end of 1 year and none had any post-operative complication.

Conclusion: Calcaneal osteotomy with lateral approach is an effective treatment for refractory Haglund's deformity provided adequate surgical steps which are followed to minimize the failure rates and to improve the clinical outcomes.

Keywords: Ankle-hindfoot scale, Calcaneal osteotomy, Haglund's deformity, Retrocalcaneal bursitis, Tendoachilles.

Introduction

Haglund's deformity, also known as the "pump bump" or retrocalcaneal bursitis, is one of the most common disorders of the foot and ankle [1]. It is the posterosuperior prominence of the calcaneus which results in a red, painful, and swollen area in the back of the heel causing pain and discomfort while walking. The non-operative measures include the analgesics, footwear modification, and local steroid or anesthetic agent infiltration into the inflamed bursa [2]. Contradictory to McGarvey et al. report, many patients do not respond to conservative treatment [2, 3]. Such patients who are refractory to conservative trial need surgical excision. Many surgical modalities have been proposed, such as partial calcaneal osteotomy, Achilles tendon debridement, and excision of the retrocalcaneal bursa [2, 4, 5, 6, 7]. Different techniques such as tendoachilles splitting, medial approach, and lateral approach to the calcaneal for osteotomy have been described which have their own advantages and disadvantages. Tendoachilles splitting may weaken the tendon, whereas the medial approach runs the risk of injury to posteromedial neurovascular bundle and also improper excision of the far cortex of the calcaneus due to poor exposure and thus leading to recurrence of symptoms. The medial or lateral approach may predispose damage to the tendoachilles tendon while performing the osteotomy using an oscillating saw which may accidentally nick the tendoachilles tendon while trying to clear the far cortex of the deformity and this may predispose to tendoachilles rupture on a later date [2]. We propose our technique of calcaneal osteotomy with the lateral approach minimizing the injury to tendoachilles.

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Materials and Methods

This study was carried out between 2015 and 2017 in our hospital. The institutional ethical committee clearance was obtained for our study. All those patients who were diagnosed to have Haglund's deformity who failed to respond to conservative trial were included in this study. The study group includes 28 patients and 30 feet. Majority of them were unilateral Haglund's deformity case and two being bilateral case. 16 were male patients and 12 female

Figure 1: (a) Pre-operative X-rays suggestive of bilateral Haglund's deformity. (b) Clinical photographs showing the surgical incision.

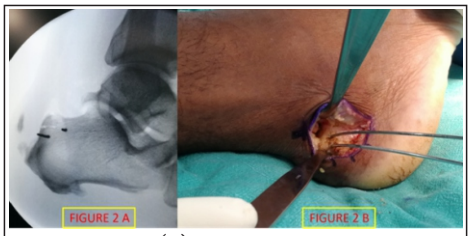

Figure 2: (a) Intraoperative image intensifier photographs of two K-wires used to mark the level of desired osteotomy. (b) Intraoperative clinical photographs of the K-wires showing the level of osteotomy.

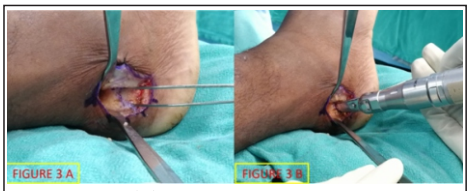

Figure 3: (a) The intraoperative clinical photographs showing the blue markings for the desired level of osteotomy.(b) The intraoperative photograph showing the oscillating saw blade stabilized by the two K-wires underneath during the osteotomy.

patients. The average age group of the patients was 40 (range 28–55 years). All patients underwent pre-operative lateral radiographs. The visual analog scale (VAS) and ankle-hindfoot scale (AOFAS) were obtained the day before surgery. The mean follow-up was 1 year (12–18 months). Post-surgery VAS and AOFAS were reassessed at the end of 1-year post-surgery.

Surgical technique

The surgery was performed under the spinal anesthesia and a tourniquet. Three to four centimeter incision was made along the lateral border of the tendoachilles and the soft tissues were elevated as a flap to avoid any skin necrosis postoperatively (Fig. 1a, 1b). We avoid the use of electro cautery to prevent any post-operative skin complications such as skin edge necrosis and wound dehiscence due to the burning of the soft tissues. Once the posterosuperior corner of calcaneus is exposed, a Hohmann retractor is passed between the point of insertion of tendoachilles and the calcaneus. Under the image intensifier (C-arm) guidance, a single K-wire is initially placed across the heel bone to determine the line of oblique osteotomy, position verified under C-arm of heel lateral view. A marker is used to draw the line, then two 2 mm thick K-wires are passed at two points in the marked plane parallel to each other, about a cm apart (Fig. 2a and b). Once the level of osteotomy is confirmed, a small oscillating saw is rested over the two K-wires and the bony prominence is excised (Fig. 3a, 3b). The two K-wires underneath the saw prevent the undue movement of the saw on either side, thus preventing any injury to the tendoachilles and also improve the stability of the saw when performing the osteotomy. After the excision, the K-wires are removed and reconfirmed under the image intensifier (Fig. 4a, 4b). Wound is closed with absorbable sutures. Compression dressing is put. Immediate post-operative X-rays are taken. Patient is allowed to weight bear as tolerated the subsequent day. Majority of the patients were back to routine activities, full weight-bearing by 4 weeks, and joined duties by 6 weeks post-operative. The patient was followed up for at least 1-year post-surgery (Fig. 5a, 5 b).

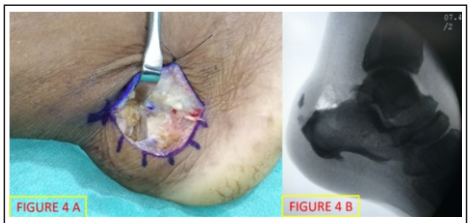

Figure 4: (a) Intraoperative clinical photograph showing complete osteotomy of the bony prominence as desired.(b) Image intensifier photographs to confirm the adequate bony excision.

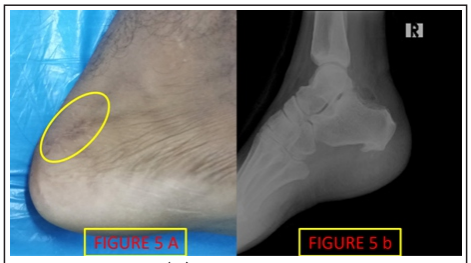

Figure 4: (a) Clinical photograph showing the healed surgical scar (as shown in yellow circle).(b) Radiographs at the end of 1-year post-surgical excision of Haglund's deformity.

Results

The average VAS postoperatively had improved to 3/10 from pre-operative VAS of 7/10. At the end of 1 year, almost all patients were satisfied with the surgery and had good outcome except for three patients who had not much symptomatic relief post-surgery. The average post-operative AOFAS had improved to 87/100 from an average pre-operative AOFAS of 66/100 (Table 1). None of the patients had any complication with respect to wound healing.

Discussion

Treating patients with refractory Haglund's deformity has always been difficult. Many techniques have been described for surgical excision of the bony prominence, none proven to be best. As described by John A. Anderson et al., the tendoachilles splitting technique gives a good exposure of the bony prominence but jeopardizes and weakens the tendoachilles [2]. The medial and lateral approach may be easier to perform, but there may be inadequate exposure of the bony prominence, also a high chance of injuring the tendoachilles tendon during the osteotomy of the bony prominence [8].

Table 1: The data of our patients

Number	Sex	Age	Sex	Pre-operative VAS(1–10)	Pre-operative AOFAS(1–100)	Post-operative VAS(1–10)	Post-operativeAOFAS(1–100)	Complications	Response
1	Male	34	Right	7	58	3	93	None	Satisfactory
2	Female	42	Right	6	72	3	88	None	Satisfactory
3	Female	38	Right	7	67	2	94	None	Satisfactory
4	Male	33	Left	8	61	3	90	None	Satisfactory
5	Female	37	Right	8	76	3	90	None	Satisfactory
	Female	37	Left	7	58	6	70	None	Unsatisfactory
6	Female	47	Right	7	70	3	91	None	Satisfactory
7	Female	41	Left	8	38	7	58	None	Unsatisfactory
8	Male	29	Left	7	75	3	89	None	Satisfactory
9	Male	55	Right	7	58	3	88	None	Satisfactory
10	Female	49	Right	8	67	3	91	None	Satisfactory
11	Male	35	Right	6	70	3	90	None	Satisfactory
12	Male	31	Left	7	71	2	89	None	Satisfactory
	Male	31	Right	7	67	3	94	None	Satisfactory
13	Female	28	Left	8	61	3	92	None	Satisfactory
14	Male	45	Left	6	75	3	90	None	Satisfactory
15	Female	39	Right	8	58	3	91	None	Satisfactory
16	Male	33	Right	8	68	4	86	None	Satisfactory
17	Male	46	Left	7	73	3	88	None	Satisfactory
18	Male	32	Left	8	66	3	90	None	Satisfactory
19	Female	48	Left	8	70	3	89	None	Satisfactory
20	Male	51	Right	7	76	4	86	None	Satisfactory
21	Male	33	Right	8	69	4	89	None	Satisfactory
22	Male	50	Right	7	75	3	90	None	Satisfactory
23	Male	47	Right	8	61	7	71	None	Unsatisfactory
24	Female	39	Right	7	71	3	88	None	Satisfactory
25	Male	41	Left	7	67	3	91	None	Satisfactory
26	Female	35	Left	8	70	3	89	None	Satisfactory
27	Female	39	Right	8	66	3	94	None	Satisfactory
28	Male	42	Left	8	61	2	91	None	Satisfactory

VAS: Visual analog scale, AOFAS: Ankle-hindfoot score

As per our study, we found that majority of our patients had good symptomatic relief and also improved ankle-hindfoot score postoperatively. The successful outcome of the surgical resection depends on the adequate removal of the bony prominence as described by Sella et al. [9,10]. We increased the intraoperative accuracy of our level of bony excision by following these steps, first protecting the TA tendon by placing a Hohmann retractor at the tendon-bone junction and then placing two parallel K-wires on the bony prominence under the image intensifier guidance and sliding the oscillating saw blade over it to accurately cut the bony prominence.

This technique has not been described earlier as per our review of literature. The K-wires help to direct the saw blade in a safe plane, thus increasing the accuracy for osteotomy. This technique not only increases the intraoperative accuracy of the cuts being made but also prevents any damage to the tendoachilles when the cut is being made as the saw blade runs over the K-wire, thus preventing excessive swaying of the saw. Surgical excision is very much needed for refractory Haglund's deformity. In our experience, the lateral approach for calcaneus osteotomy has been rewarding. The intraoperative accuracy of the osteotomy can be increased by image intensifier and two parallel K-wiresat the level of osteotomy, thus preventing the inadequate excision of the bony prominence which is one of the common reasons for poor patient satisfaction post-surgery.

Conclusion

The surgical excision of the Haglund's deformity is an effective treatment in patients with failed conservative management. However, the satisfactory outcome depends on the complete clearance of the bony deformity and avoiding any iatrogenic injury to tendoachilles while trying to achieve the former. Taking additional precautionary surgical steps as mentioned in this study can increase the accuracy of bony deformity clearance and prevent damage to tendoachilles.

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