

# **Patient Reported Outcomes of Minimally Invasive Zadek Osteotomy Compared to Open Midline Achilles Tendon Splitting Haglund's Resection**

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## **INTRODUCTION:**

Surgical options for insertional Achilles tendinopathy (IAT) and Haglund's deformity include the open midline Achilles tendon splitting approach with Haglund's resection and Achilles debridement and repair. However, many have cited high rates of complications with this approach such as wound dehiscence, infection, and persistent postoperative pain. Alternative surgical management of IAT and Haglund's deformity includes the Zadek osteotomy (ZO). ZO can be accomplished percutaneously, reducing potential wound complications, pain, and infection. The current study compared outcomes and complications of the open midline Achilles tendon splitting approach with the percutaneous ZO in patients with IAT and Haglund's deformity. We hypothesized that the percutaneous ZO would allow for improvement in patient reported outcomes, yet less complications in comparison to the traditional, open midline Achilles tendon splitting approach.

## **METHODS:**

Patients who received an open midline Achilles tendon splitting procedure or percutaneous ZO for IAT and Haglund's deformity were identified and retrospectively analyzed at a minimum of one-year follow-up. Twenty-one patients treated with percutaneous ZO and 45 patients treated with open midline Achilles tendon splitting procedure for IAT and Haglund's deformity met our inclusion criteria. Patients had average follow up of 23.65±6.87 months. Preoperative Patient Reported Outcome Measurement Information System (PROMIS) scores, postoperative PROMIS scores, complications, and revisions were recorded for each patient. Preoperative and postoperative PROMIS scores were compared using a paired t-test. All other continuous data was compared by t-test; all categorical data was compared using Chi-squared analysis. All p< 0.05 were considered significant.

## **RESULTS:**

In patients who underwent percutaneous ZO or an open midline Achilles tendon splitting Haglund's resection, PROMIS function (p< 0.01), pain (p< 0.01), and mobility (p< 0.01) scores improved at 12-month minimum follow-up. In the ZO group, 1/21 (4.6%) patients experienced nerve injury and 1/21 (4.6%) patients required revision surgery to an open midline splitting Haglund's resection. Meanwhile, 3/45 (6.67%) patients who underwent an open midline Achilles tendon splitting procedure experienced significant postoperative pain, 3/45 (6.67%) wound dehiscence, 3/45 (6.67%) wound infection, and 1/45 (2.22%) nerve injury. 4/45 (8.89%) patients who underwent the open midline Achilles tendon splitting approach required revision. Additionally, 1/45 required hardware removal and 1/45 required incision and debridement. All cause complication were found to be higher in the open midline Achilles tendon splitting approach (p=0.02).

## **DISCUSSION AND CONCLUSION:**

There are several surgical treatment options for IAT and Haglund's deformity, yet IAT remains a challenging lower extremity disorder to treat. In the current study, both the open, midline Achilles tendon splitting Haglund's resection and percutaneous ZO led to significant improvement in patient reported outcomes. However, our study demonstrated a significant lower complication and revision in the ZO group. Data presented in this study may guide surgeons' decision making when choosing suitable treatment options for patients with IAT and Haglund deformity.

Table 1a. Study Population					
	N	Age	Sex	R/L	Final f/u months
Zadek	21	54.72 ± 11.29	14 F (66.67%)	12 L (57.14%)	17.78 ± 2.76
Open Haglund	45	53.80 ± 9.99	30 F (66.67%)	30 L (66.67%)	26.39 ± 6.48
p		0.743	1.000	0.454	0.323

Table 1b. PROWMS Scores		Pre function	Pre pain	Pre mobility		
	Zadek	38.34 ± 6.27	65.40 ± 5.87	35.00 ± 6.16		
	Open Haglund	36.95 ± 5.50	65.80 ± 5.72	34.54 ± 4.81		
	p	0.378	0.81	0.750		
		Post function	p	Post pain	p	Post mobility
	Zadek	42.90 ± 9.61		54.43 ± 9.62		40.86 ± 9.09
	Open Haglund	41.46 ± 7.68	<0.001*	58.16 ± 6.79	<0.001*	40.00 ± 7.47
	p	0.520		0.078		0.692
		Function change	Pain change	Mobility change		
	Zadek	4.56 ± 8.01	-10.97 ± 9.81	5.86 ± 8.99		
	Open Haglund	4.40 ± 8.64	-7.70 ± 7.44	4.32 ± 10.77		
	p	0.950	0.143	0.593		

Table 1c. Complications		Revision	I/D	ROH	Dehiscence
	Zadek	1 (4.76%)	0 (0%)	0 (0%)	0 (0%)
	Open Haglund	4 (8.89%)	1 (2.22%)	1 (2.22%)	3 (6.67%)
	p	0.555	0.491	0.491	0.226
		Infection	Nerve injury	Pain	Other
	Zadek	0 (0%)	0 (0%)	0 (0%)	0 (0%)
	Open Haglund	3 (6.67%)	1 (2.22%)	3 (6.67%)	1 (2.22%)
	p	0.226	0.491	0.211	0.491