For Surgical Treatment of Insertional Achilles Tendinopathy, Does Augmentation with Flexor Hallucis Longus Transfer Result in Better Patient-Reported Outcomes?

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INTRODUCTION: Insertional Achilles tendinopathy is a common condition which can result from anatomic, mechanical, and/or biochemical etiologies. Mild cases are often successfully treated conservatively, however more severe cases frequently require surgical management. Common surgical techniques involve debridement and reattachment of the tendon with or without ostectomy of impinging calcaneal bone spurs (i.e., Haglund's deformity). Augmentation with a flexor hallucis longus (FHL) transfer can be performed to help provide extra strength to the degenerated tendon. Prior studies have shown similar clinical outcomes between debridement alone and FHL augmentation, however these did not involve validated patient-reported outcome measures. Therefore, the objective of this study is to compare patient-reported outcome measures using the validated Patient-Reported Outcomes Measurement Information System (PROMIS) in patients with insertional Achilles tendinopathy undergoing debridement alone and augmentation with FHL transfer.

METHODS: This retrospective cohort study included patients treated by 8 different fellowship-trained foot and ankle surgeons. Patients were included if they were over 18 years old, underwent surgical treatment for insertional Achilles tendinopathy, and had preoperative and minimum 1-year postoperative PROMIS scores. Patients who had prior surgical treatment of the ipsilateral Achilles tendon, acute or chronic Achilles tendon rupture, or mid-substance Achilles tendinosis were excluded. A total of 67 patients met the inclusion and exclusion criteria. Patients were divided into two groups. The first group, named "control," consisted of 39 patients who underwent debridement with or without ostectomy alone. The second group, named "FHL transfer," included 28 patients who underwent the same procedures with the addition of a FHL transfer. Preoperative, minimum 1-year postoperative, and preoperative to postoperative change in PROMIS scores from the Physical Function, Pain Interference, Pain Intensity, Global Physical Health, Global Mental Health, and Depression domains were compared within and between groups. For statistical analysis, paired t-tests were used to evaluate improvement within groups, and Student's t-tests were employed to compare PROMIS outcomes between groups.

RESULTS:

The 67 patients included in the final analysis showed no significant differences in age, gender distribution, or BMI between groups (Table 1). Average PROMIS follow up was 19.4 months in the control group and 20.7 months in the FHL transfer group ($P = .4$). Preoperatively, the FHL transfer group had a significantly higher Pain Interference score compared to the control group ($P < .05$), otherwise there were no significant differences in the remaining preoperative PROMIS domains. Postoperatively, there were no significant differences in PROMIS scores in any domain between groups (Table 2). Both groups demonstrated significant preoperative to postoperative improvements in PROMIS Physical Function, Pain Interference, Pain Intensity, and Global Physical Health (all $P < .001$). Only the FHL transfer group had significant improvements in Global Mental Health ($P < .001$) and Depression ($P < .05$) [Table 3]. When comparing preoperative to postoperative improvement between groups, the FHL group had significantly greater improvements in Pain Intensity ($P < .05$) and Global Mental Health ($P < .05$).

DISCUSSION AND CONCLUSION:

In comparing debridement alone to augmentation with FHL transfer for surgical treatment of insertional achilles tendinopathy, our study demonstrated similar patient-reported outcomes in most PROMIS domains, but greater pain-related improvements in the FHL transfer group. This indicates that augmentation with a FHL transfer may offer similar functionality, but greater pain relief compared to debridement alone, possibly due to the increased support and stability provided by the tendon transfer. The similar improvement in physical function between groups reflects prior findings in the literature suggesting no clinically relevant loss in hallux plantarflexion strength. Therefore, for surgical management of insertional Achilles tendinopathy, augmentation with a FHL transfer may be an effective option, especially in patients with greater baseline pain.

Table 1: Demographics of Control and FHL Transfer Patients Undergoing Surgical Treatment for Insertional Achilles Tendinopathy

	Control (n = 39)	FHL Transfer (n = 28)	P-value
Age	53.2 ± 11.2	56 ± 11.1	0.3
Sex, n (%)			
Male	23 (59)	13 (46)	0.3
Female	16 (41)	15 (54)	
BMI	28.4 ± 5.2	30.1 ± 5.7	0.06

Data presented as mean ± SD

Table 2: Preoperative and Postoperative PROMIS Scores in Control and FHL Transfer Patients Who Underwent Surgical Treatment for Insertional Achilles Tendinopathy

	Control	FHL Transfer	P-value
Preoperative			
Physical Function	41.2 ± 5.6	40.7 ± 7.2	0.7
Pain Interference	59.3 ± 4.8	62.5 ± 7.4	**0.04**
Pain Intensity	52.1 ± 7.2	53.5 ± 7.5	0.4
Global Physical Health	46.2 ± 7.5	42.5 ± 7.8	0.06
Global Mental Health	53.4 ± 6.8	51 ± 8.2	0.2
Depression	46.7 ± 7.1	48.1 ± 9.3	0.5
Postoperative			
Physical Function	54 ± 10	52.9 ± 8.5	0.6
Pain Interference	47.5 ± 8.5	46.4 ± 8.3	0.6
Pain Intensity	38.3 ±8	36.6 ± 7.7	0.4
Global Physical Health	54.5 ± 9.3	54.2 ± 8	0.9
Global Mental Health	53.9 ± 8.5	56.2 ± 7.7	0.3
Depression	45.8 ± 8.4	44.7 ± 7.9	0.6

Data presented as mean ± SD

Table 3: Preoperative to Postoperative PROMIS Changes Following Surgical Treatment for Insertional Achilles Tendinopathy in Control and FHL Transfer Patients

	Control	P-value	FHL Transfer	P-value
Physical Function	12.8 ± 11	**< 0.001**	12.2 ± 9	**< 0.001**
Pain Interference	-13.8 ± 9.2	**< 0.001**	-16.6 ± 8.4	**< 0.001**
Pain Intensity	-12.1 ± 9.3	**< 0.001**	-16.1 ± 8.8	**< 0.001**
Global Physical Health	8.7 ± 11	**< 0.001**	11 ± 6.7	**< 0.001**
Global Mental Health	0.5 ± 7.9	0.7	4.2 ± 4.9	**< 0.001**
Depression	-0.8 ± 8	0.6	-2.9 ± 6.2	**0.03**

Data presented as mean ± SD