



## Abstract

This study was performed in order to evaluate the efficacy of the cheilectomy procedure for different degrees of elevatus. The study was an IRB approved retrospective comparative study of 40 patients over 5 years. Survival rate for this study was defined as patients who did not require revision surgery after cheilectomy procedure.

## Statement of Purpose

This study was performed in order to quantify the effect of elevatus on cheilectomy survival rates over 5 years and to investigate how degree of elevatus affects cheilectomy outcomes.

## Introduction

Elevatus has been implicated in the development of hallux rigidus (1). It is not well understood how the degree of elevatus affects surgical outcomes for patients undergoing cheilectomy. Also it is not known if there is a degree of elevatus which could affect procedure choice and significantly impact outcomes.

## Level of Evidence

Level III, Therapeutic

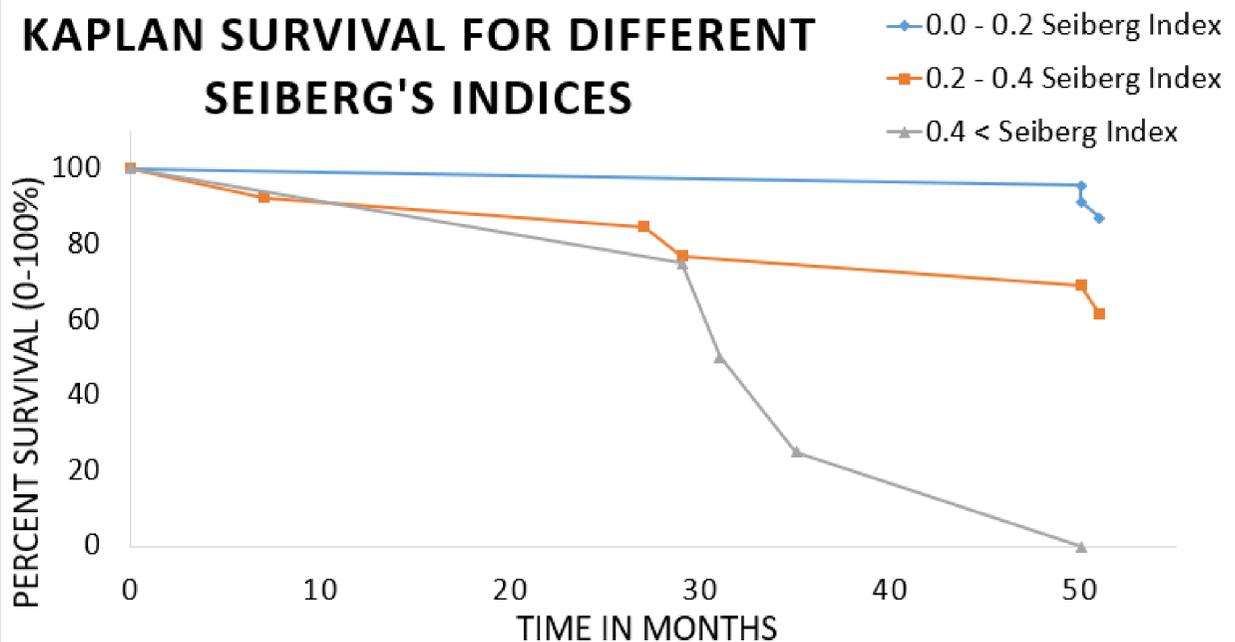
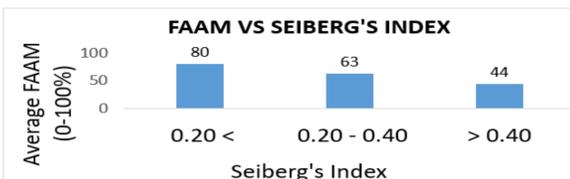
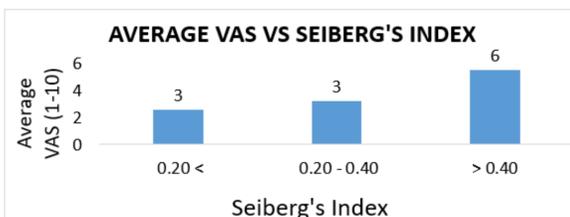
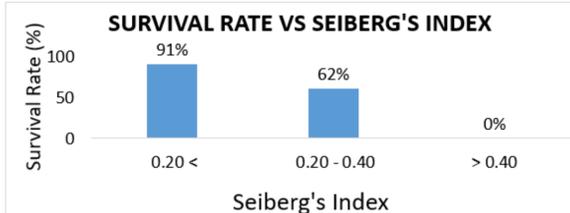
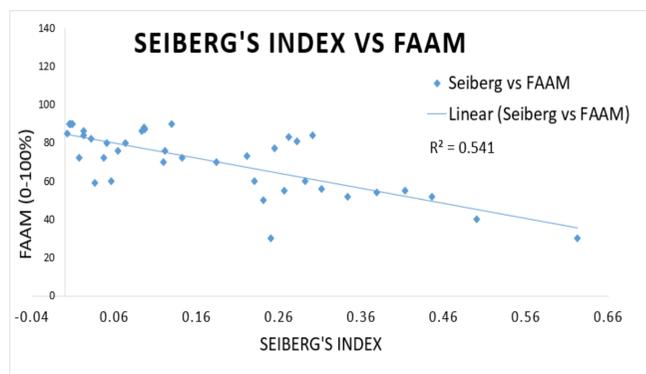
## Literature Review

- **Survival rate:** Survival rate for this study was defined as patients who did not require revision surgery after cheilectomy procedure.
- There are no studies quantitatively measuring degrees of elevatus with long term survival rates and outcomes after the cheilectomy procedure
- Causes of hallux rigidus are multifactorial (2). Elevatus, BMI, calcaneal inclination have also been implicated in hallux rigidus there are no quantitative comparisons between these variables.
- There is a large discrepancy in outcomes after cheilectomy: ranges with asymptomatic relief from 63 – 97 % at a mean of 5 year follow up (3)
- 10-year data – longest term data demonstrates – 90% good or excellent results (4).
- Foot and Ankle Ability Measurement (FAAM) is a self-reported functional outcome determines physical functions for individuals (5).

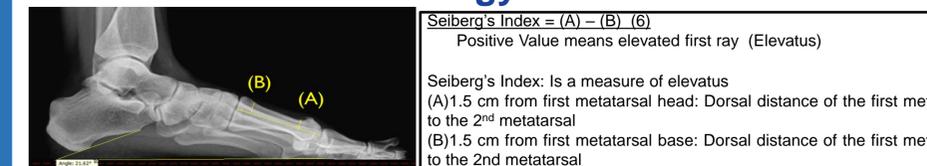
## Results

### P-Value Status-Post Cheilectomy 5 Years

	FAAM	VAS	Survival
Gender	0.558	0.213	0.361
BMI	0.678	0.242	0.747
Smoker	0.132	0.160	0.426
Age	0.888	0.917	0.741
Calcaneal Inclination	0.101	0.276	0.231
Elevatus	<0.01	0.012	0.004



## Methodology and Procedure



Seiberg's Index = (A) - (B) / (6)  
Positive Value means elevated first ray (Elevatus)

Seiberg's Index: Is a measure of elevatus  
(A) 1.5 cm from first metatarsal head: Dorsal distance of the first met to the 2<sup>nd</sup> metatarsal  
(B) 1.5 cm from first metatarsal base: Dorsal distance of the first met to the 2<sup>nd</sup> metatarsal

- 5 Year - IRB approved retrospective study
- 2012 – 2013 – 40 patients all had cheilectomy procedure – sample size was calculated to be statistically significant
- Subjects were controlled via elevatus degree (0.0-0.20, 0.20-0.40, >0.40 mm)
- Exclusion criteria: BMI over 45, Less than 40 years old, Peripheral neuropathy, peripheral vascular disease, previous first ray or rearfoot surgery
- Cheilectomy was performed as index procedure by the same surgeon
- Charts were reviewed and demographic information: smoking status, BMI, age, gender were collected
- Survival rate were compared via Student's t-test, Pearson's correlation, and Kaplan survival analysis
- Phone survey determined Foot and Ankle Ability Measurement (FAAM), Visual Analogue Scale (VAS) Pain
- Software was used to calculate Seiberg's index preoperatively

## Conclusions

- BMI, smoking status, high calcaneal inclination angle do not have high correlation with cheilectomy clinical outcomes or survival rate.
- The greatest predictor for poor outcomes was elevatus
- FAAM and VAS show an inverse correlation with the degree of elevatus.
- Overall 5-year survival rate for the cheilectomy for 0 - 0.40 seiberg's indices was 73% in line with published data (3).
- 5-year Survival rate for cheilectomy with a seiberg's index above 0.40 was 0%, making cheilectomy for these patients inadvisable.

## References

- (1) Long-Term Follow-Up of the Cheilectomy for Degenerative Joint Disease of the First Metatarsophalangeal Joint, Nicole Nicolosi et al. The Journal of Foot & Ankle Surgery 54 (2015) 1010–1020.
- (2) Hallux rigidus, Coughlin et al. J Bone Joint Surg Am. 2004 Sep;86-A Suppl 1(Pt 2):119-30
- (3) Rate of Revision After Cheilectomy Versus Decompression Osteotomy in Early-Stage Hallux Rigidus, Cullen et al. J Foot Ankle Surg. 2017 May - Jun;56(3):586-588. doi: 10.1053.
- (4) Hallux rigidus. Grading and long-term results of operative treatment, Coughlin et al. J Bone Joint Surg Am. 2003 Nov;85-A(11):2072-88.
- (5) Martin RL, Hutt DM, Wukich DK. Validity of the Foot and Ankle Ability Measure (FAAM) in Diabetes Mellitus. Foot Ankle Int. 2009 Apr;30(4):297-302.
- (6) Metatarsus primus elevatus in hallux rigidus: fact or fiction? Roukis et al. J Am Podiatr Med Assoc. 2005 May-Jun;95(3):221-8.