Surgically Induced Astigmatism Calculator: Holladay versus Alpins Methods



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Record 1 of 4

Introduction

- Astigmatism amount caused by cataract surgery is 0 known as surgically induced astigmatism (SIA) value. The SIA value is vital in toric intraocular lens (IOL) selection.
- There are two accepted methods in SIA calculation; Holladay method and Alpins method.
- Nevertheless, the agreement between these two 0 calculators are remain under-explored.



Results & Discussion

 Table 1: The 95% LoA of Mean Individual SIA Values
Between Calculators

Compared Calculators	Individual SIA (D)	Range 95% LoA (D)
SIA 2.1	0.7181 ± 0.41 D	-0.003 to +0.003
VectrAK	0.7184 ± 0.41 D	

- There was no difference in mean individual SIA Ο between the two calculators (P = 0.71).
- Bland and Altman analysis showed the two Ο calculators were agreeable to each other.
- These results suggest that regardless of Ο Holladay¹ or Alpins² methods is incorporated into SIA calculator, the SIA value produced would be the same.
 - It is explained by the vector analysis based on the Cartesian coordinate which applied in both Holladay and Alpins methods.

Conclusion

- 35-85 years old Ο
- Uneventful phacoemulsification Ο November 2017-February 2018
- Postoperative period > 6 weeks Ο
- No corneal scar, corneal Ο dystrophies, corneal ectasia, history of previous ocular surgery
- **Regular** cornea Ο

Surgeon criteria Ο

- Four institutional ophthalmic Ο surgeons.
- Clear corneal incisions (CCI): Ο
 - 2.20 mm at 90° 0
 - 2.75 mm at 70° or 110° 0

Calculators Ο

- SIA 2.1 (Holladay method) Ο
- VectrAK (Alpins method) Ο

References

- 1.Holladay JT, Moran JR, Kezirian GM. Analysis of aggregate surgically induced refractive change, prediction error, and intraocular astigmatism. J Cataract Refract Surg. 2001;27(1):61-79.
- 2. Alpins N. Astigmatism analysis by the Alpins method. J Cataract Refract Surg. 2001;27(1):31-49.
- **o** Both Holladay and Alpins method SIA calculators are able to provide identical individual SIA values. • Therefore, any of these calculators can be used interchangeably. IA CALCULATO Version 2.1 0 **Data entry and Analysis** 2010 DENTIFIERS COMMENTS CR No Preop Keratometry Individual SIA ostop Keratometry xclusio or Case No Eye Name Kh Axis Kv Axis Kh Axis Ky Axis Amount Axis hould this D deg Or MRD No D D deg deg D deg data be OF OPD No Figure 1: SIA 2.1 **VERSUS Figure 2: VectrAK** VECTNAK - Vector Calculator -----Elle Search Estient Esport/Analysis Help 1 Patient 2 First ONE Last DEMONSTRATION Patient Id SC7892 Eye 00 - Surgical Procedure EXCMER LASER SURGERY Date 2/03/2013 (F Ungrouped 14 44 4 **F** FF FR 🔓 4.12 That is the pre-operative corneal actionation value? 62 decrees w much corneal asignation are you trying to reduce? Zongh 11-5 that is the comeal meridian you are attempting to flatten? 55 degrees 0.67 What is the post-operative comeal astignation value? e [Reliaction Values Albing Method TIA 310 135 deg 4.4 Pse Op Astignation Sinple Palar Value 412 WTR SIA 3.47 753 deg Vector Polar Value 230 WTR 2.06 94 deg **Difference Vector** WTR 321 ATR 0.91 Angle of Error Current Astigmatism Simple Polar Value EET WTR situde of Error Vector Polar Value 0.23 WTR WTR 0.45 ATR 0.22 0.67 **Coefficient of Adjustment** Astignation Change Simple Subraction -7.45 180 deg -145 ATR Torque(Dw) 2:04 Single Polar Net Induced Value 45 des Flattening 2.91 Ax -2:07 ATR Vector Polar Net Induced Value 0.91 Flattening Index Surperies NO X Cancel 👖 Dose Version 2.2.1 Build 120820 Save .