

# Is adjustment of IOL power calculation in second eye surgery a useful strategy?

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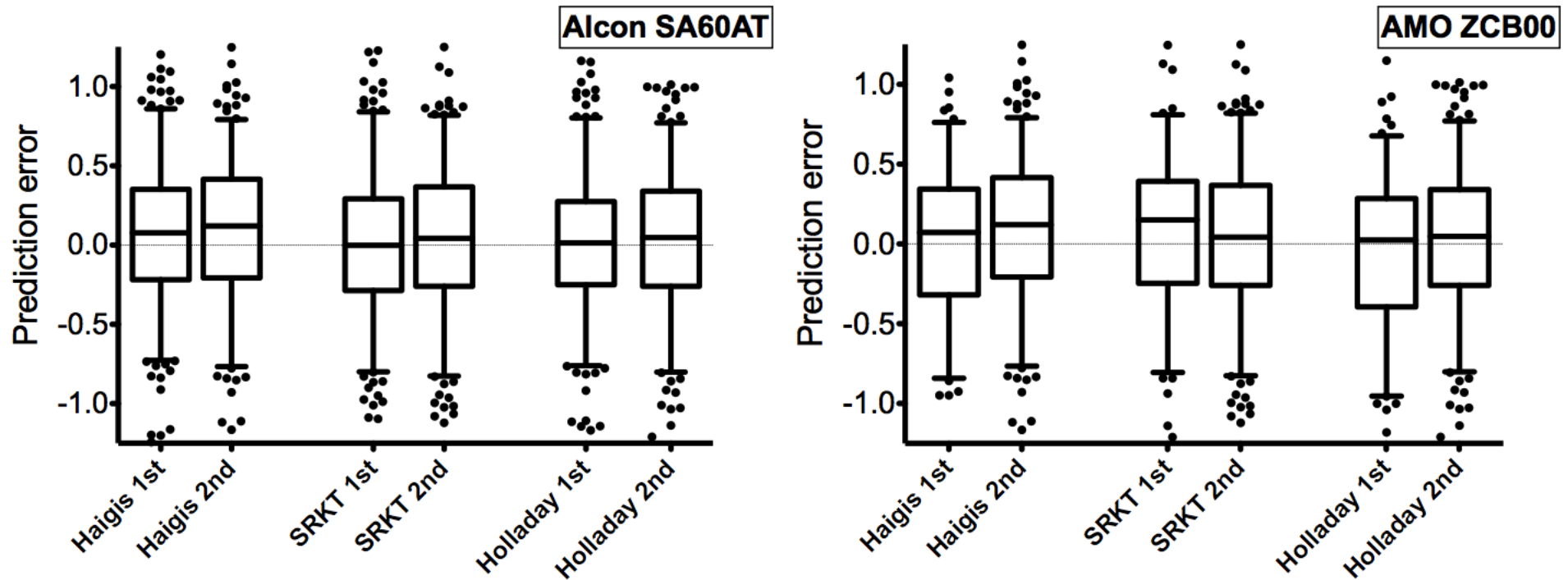


# Introduction

- With IOLMaster<sup>®</sup> biometry, 3rd generation formulae and optimized constants, excellent refractive results can be achieved in cataract surgery
- However, refractive errors cannot be avoided completely
- Largest component of prediction error is the effective position of the IOL\*
- Is prediction error of 1st and 2nd eye independent?
- If not: can IOL calculation of 2nd eye be tweaked to the advantage of refractive precision?

\* Olsen JCRS 1992; 18(2), Norrby JCRS 2008; 34(3), Preußner Klin Monatsbl Augenheilkd 2007; 224

# Refractive results w/o adjustment



Very good and comparable refractive predictability for both IOL and all formulae examined. For our cohort, published constants for AMO Tecnis ZCB00 (right figure) seem to be slightly too low.

Prediction error (PE) of 1st eye and 2nd eye **strongly correlated**

Haigis  $r=0,41$  SRK/T  $r=0,45$  Holladay  $r=0,43$  HofferQ  $r=0,50$

$P < 10^{-8}$

# Tweaking IOL selection for 2nd eye

- SRK/T formula used (most popular formula)
- Achieved spectacle refraction – predicted spectacle refraction = prediction error (PE)
- PE 1st eye between  $-0,33$  and  $+0,33$  → no change for 2nd eye IOL selection
- PE  $> +0,33$  → 0,5 D added
- PE  $> +0,66$  → 1,0 D added
- PE  $< -0,33$  → 0,5 D subtracted
- PE  $< -0,66$  → 1,0 D subtracted

# Results

	eyes	percentage
no adjustment made	286	65.6%
-1.0 D adjustment	33	7.5%
-0.5 D adjustment	49	11.2%
+0.5 D adjustment	79	18.0%
+1.0 D adjustment	39	8.0%

	2nd eye unadjusted	2nd eye adjusted
median absolute error	0.30 D	0.26 D
mean error $\pm$ SD	0.03 $\pm$ 0.49 D	0.01 $\pm$ 0.44 D
eyes within $\pm$ 0.5 D	74.1%	78.7%
eyes within $\pm$ 1.0 D	95.4%	96.6%



# Conclusion

- Prediction error of 1st and 2nd eye are **not** independent of each other
- Tweaking IOL calculation for 2nd eye surgery **can** improve refractive outcome
- Clinical impact is relatively small
- Large errors generally cannot be avoided by this method
- Measurement problems, confusion of IOL, upside down implantation, OVD residue etc. must be ruled out before applying statistical methods