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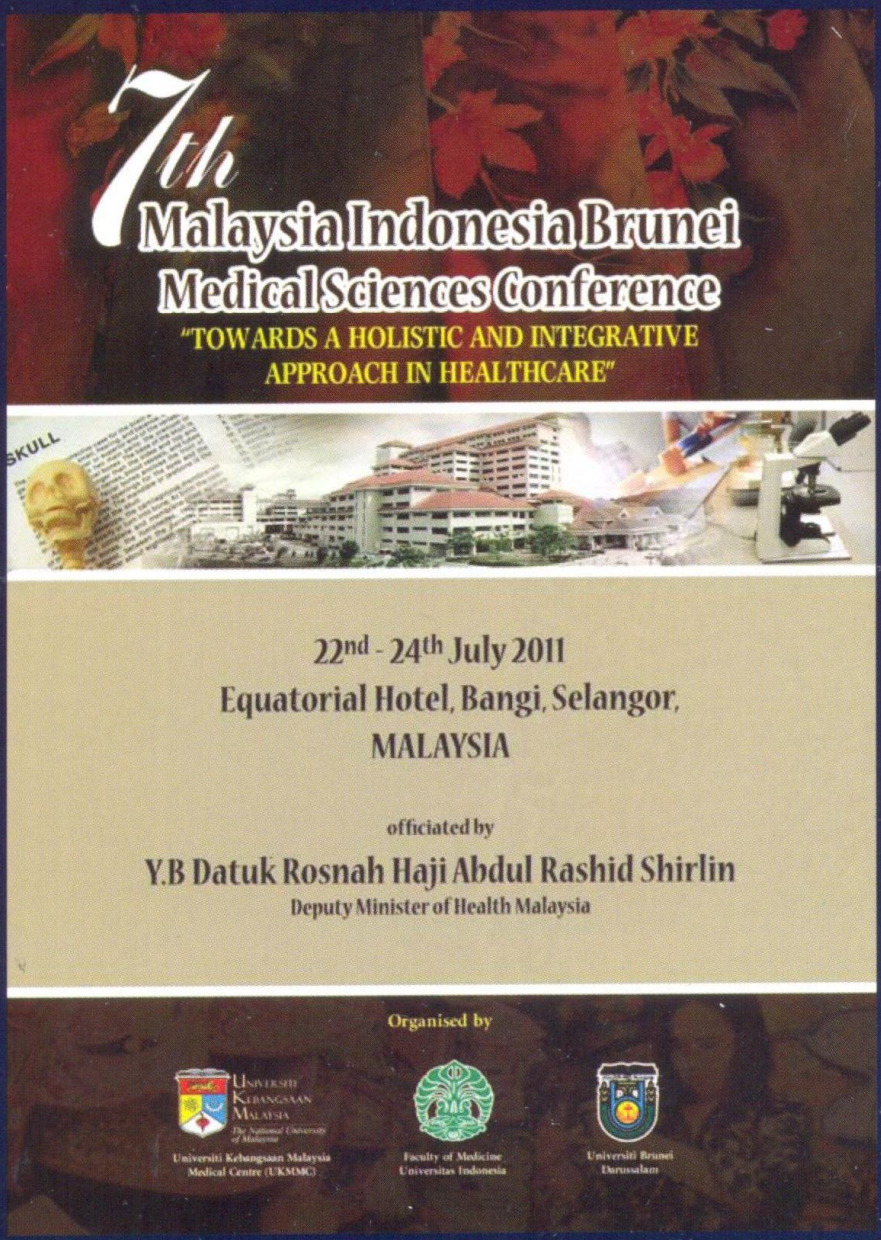

COMPARISON OF SURGICALLY INDUCED ASTIGMATISM (SIA) AND CORNEAL WAVEFRONT ABERRATION IN PHACOEMULSIFICATION BETWEEN 1.8MM AND 2.75MM CLEAR CORNEAL INCISION

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Background:
Cataract operation has move towards achieving crystal clear vision with the advent of premium intraocular lens and superior surgical techniques. The size of corneal incision may cause surgically induced astigmatism and alteration of corneal wavefront aberration, leading to compromised final visual outcome. The aim of this study was to compare the differences between 1.8mm and 2.75mm clear corneal incision (CCI) on surgically induced astigmatism (SIA) as well as postoperative Root Mean Square (RMS) and corneal wavefront aberration changes.

Materials and Methods:
Phacoemulsification was performed on 59 eyes which included 28 eyes having 1.8mm and 31 eyes having 2.75mm CCI. Corneal topography was done two weeks preoperatively and one month postoperatively. The data was used to calculate SIA, RMS and corneal wavefront aberrations.

Results:
The results showed that there was no significant difference for central and simulated SIA between the 1.8mm and 2.75mm group ($p=0.081$, $p=0.641$ respectively). The mean simulated SIA in the 2.75mm group (0.914±0.603 D) was higher than in the 1.8mm group (0.556±0.496 D). There were no significant changes in total RMS and high order RMS (HoRMS) ($p>0.05$). In the 2.75mm group, there were significant changes in two Zernike aberrations which are WTR/ATR Astigmatism ($p<0.05$) and Horizontal Coma ($p<0.05$). Whereas, in the 1.8mm group, there were no significant changes.

Conclusion:
In conclusion, there was no statistical difference to show that the smaller incision group (1.8mm) had better results compared to the bigger incision group (2.75mm) in terms of surgically induced astigmatism and corneal wavefront aberration except in few Zernike terms. Incisional site (at the steepest axis) however was the most important factor to produce better visual outcome for cataract patients.

Key words:
astigmatism, corneal wavefront aberration, cataract, phacoemulsification, corneal topography