Simulation of toric intraocular lens results: Manual keratometry versus dual-zone automated keratometry from an integrated biometer

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PURPOSE: To evaluate simulated clinical outcomes in patients with toric intraocular lenses (IOLs) calculated on the basis of dual-zone automated keratometry from an integrated optical biometer, relative to manual keratometry.

SETTING: Private practice, Mesa, Arizona, USA.

DESIGN: Comparative case series.

METHODS: Patient records at 4 clinical sites were reviewed to identify patients who had manual keratometry and biometry with the Lenstar LS 900 recorded before toric IOL implantation and refractive follow-up data after implantation. Preoperative and operative data were extracted from patient charts. Simulated refractive outcomes were calculated based on mathematically removing the actual IOL implanted and then mathematically inserting the IOLs as determined by manual or automated keratometry from the biometry device.

RESULTS: Data for 128 patients were available for analysis. The actual residual astigmatism was comparable between manual keratometry and automated keratometry from the biometry system. Although simulated residual refractive astigmatism was similar between the 2 devices on average, there was variability in results by patient. Simulated residual refractive astigmatism was lower for the biometer when the standard deviation of the angle of astigmatism was low. Site-to-site variability was lower with the biometer than with manual keratometry.

CONCLUSIONS: Simulated outcomes suggest that overall results for a group of patients whose toric IOL surgery planning is performed with the dual-zone automated keratometry data from the biometer will be equivalent to those when manual keratometry is used. The reduced site-to-site variability with the biometer suggests an operational advantage.

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For several years, it has been possible to use toric intraocular lenses (IOLs) to correct existing corneal astigmatism at the time of cataract surgery. Use of a toric IOL was first reported by Shimizu et al. in 1994. The successful use of a toric IOL involves measuring the existing anterior corneal astigmatism, accounting for any astigmatism induced by the surgical incision, and implanting the toric IOL at the appropriate angle to compensate for the combined preoperative and surgically induced astigmatism (SIA). Rotational stability is also important.

There are numerous methods to measure corneal astignatism. In the case of the Acrysof toric IOL, the original study conducted for the U.S. Food and Drug Administration approval relied on manual keratometry to determine the corneal astigmatism. As such manual keratometry has been advocated as a preferred methodology for corneal astigmatism measurement.

Early research comparing manual keratometry and automated keratometry suggested that manual keratometry was the gold standard. Later studies indicated that manual and automated keratometry produce comparable results, although with less variability in the automated results. This change is likely related to improvements in the technology of automated keratometers. In the area of cataract surgery,

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IOL Power Kenneth Hoffer, 2024-06-01 IOL Power by Kenneth J Hoffer MD will be the definitive resource worldwide for ophthalmologists who strive to increase the accuracy for all IOL calculations especially for multifocal IOLs and overcoming the challenges that arise when treating patients that have had laser refractive surgery such as RK PRK LASIK and LASEK Inside the pages of IOL Power Dr Hoffer is joined by some of the most respected international physicians and physicists in the field of IOL power such as Aramberri Haigis Norrby Olsen and Shammas Together their expertise spanning over 35 years makes even the most difficult subjects easy to understand This volume will become the definitive reference source on the subject of IOL power calculation Some topics include Ultrasound velocities for axial length measurement Optical AL IOLMaster and Lenstar in difficult eyes Manual and automatic keratometry and instrumentation Topography Scheimpflug camera corneal power Value of theoretic formulas Formula personalization Multifocal and toric IOLs Aspheric IOLs Effect of IOL tilt on astigmatism Chapters Cover All aspects of obtaining the most accurate biometry Available modern calculation formulas Latest instruments Problems that can arise how to prevent and repair them IOL Power by Kenneth J Hoffer MD is structured in a logical manner so as to cover every facet of IOL power from the basics to the most complicated subjects to achieve the most accurate and precise calculations and should be in the hands of all ophthalmic surgeons technicians Mastering Refractive IOLs David F. Chang, 2008 The IOL technical specifications the clinical residents and students data and the necessary clinical and surgical skills comprise the scientific foundation for achieving a premium refractive outcome To consistently achieve patient satisfaction however requires mastering the art of patient and IOL selection communicating and counseling effectively and providing a premium patient experience This is a nontraditional book in which multiple experts are separately asked to discuss controversial subjects in a reader friendly format There is balanced coverage of all of the available refractive IOLs as well as those that may become available in the near future A major emphasis is placed on avoiding and managing complications or potentially dissatisfied patients There are more than 200 chapters that are organized into 14 major sections over 300 images 100 tables and 12 sidebars that cover every aspect of refractive IOL clinical practice. This is a comprehensive educational resource addressing the most demanding and rapidly evolving area in cataract and refractive surgery today and the first book to cover both the clinical and nonclinical aspects of offering refractive IOL services Moorfields Manual of Ophthalmology Timothy L Jackson, 2019-11-30 This third edition expands on the success of the best selling second edition to create the most practical and accessible ophthalmology manual for trainees With its succinct practical text profusion of clinical photos and descriptions of procedures the Moorfields Manual of Ophthalmology has established itself as one of the most popular and recognisable clinical resources available to ophthalmologists and optometrists Trainee reviewers provided feedback on the second edition that guided improvements to the third edition DESIGN Colour coded chapter tabs to improve navigation Descriptions of common procedures appear in

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classification and surgical management following penetrating keratoplasty Supplementary videos of informative sample cases are included to further aid everyday practice Cataract Surgery from Routine to Complex Randall Olson, George Jin, Ike Ahmed, Alan Crandall, 2024-06-01 Cataract Surgery from Routine to Complex A Practical Guide provides eye care professionals guidance on what to do and how to avoid potential complications in all aspects of cataract surgery just as if the world's experts were by your side Drs Randy Olson George Jin Ike Ahmed Alan Crandall Robert Cionni and Jason Jones concisely provide a wealth of information including a detailed list of key issues and considerations for virtually all the possible contingencies of the procedure Some Topics and Sections Include Examination Pupil size ocular dominance biometry and more IOL Choice Monofocal aspheric vs traditional presbyopia correcting mutifocal vs accommodating toric and more Routine Cataract Surgery Microincision cataract surgery OVD selection current phacoemulsification techniques and more Complex Cataract Surgery Hypermature cataract small pupil pseudoexfoliation nanophthalmos pediatric cataract and more Intra Operative Complications Wound burn posterior capsular rupture shallow anterior chamber and more Patient Assessment Visual acuity refraction visual quality and more Postoperative Complications Endophthalmitis toxic anterior segment syndrome IOL dislocation and more Cataract Surgery from Routine to Complex also includes a companion website that provides more than 2 hours of learning with 38 edited and narrated video presentations perfectly complementing the procedures discussed inside the text Cataract Surgery from Routine to Complex is the combination of a practical guide with broad academic underpinnings along with current controversial subjects on cataract surgery making it ideal for eye care professionals who wish to update their knowledge and translate it into improved surgical techniques and better cataract patient education Essentials of Ophthalmology Samar K Basak, 2019-06-30 The seventh edition of this manual has been fully revised to provide trainees in ophthalmology with the latest advances in their field Divided into 28 chapters the book begins with discussion on ocular embryology and anatomy physiology neurology pharmacology refraction and history taking and physical examination Each of the following chapters is dedicated to the diagnosis and management of disorders and diseases in different parts of the eye lens uvea retina optic nerve vitreous and more The book concludes with sections on ocular injuries blindness common surgeries and surgical instruments The comprehensive text is further enhanced by nearly 1200 ocular images figures and tables Key points Comprehensive guide to diagnosis and management of ocular diseases and disorders for trainees Fully revised seventh edition providing latest advances in the field Highly illustrated with nearly 1200 images figures and tables Previous edition 9789352501601 published in 2015 **Optics for the New Millennium** Kamran M. Riaz, G. Vike Vicente, Daniel Wee, 2022-08-25 This textbook serves as a comprehensive manual on Optics that includes both didactics and assessment questions in an easy to read format It provides an educational and entertaining resource that reinforces the relevance of the subject matter to modern clinical and surgical ophthalmology practice. The book offers a one stop compendium for students studying for certification exams and for practicing ophthalmologists to review and learn Optics

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