MASTERING THE PHACODYNAMICS (Tools, Technology and Innovations)
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Mastering the Phacodynamics (Tools, Technology and Innovations)

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Foreword

Cataract surgery is the most common surgical procedure performed in the world, approaching 3 million procedures per year in the United States alone and 15 million worldwide. Phacoemulsification, pioneered in 1965 by Charles Kelman, is about to enter its fifth decade of continuing innovation in technology and technique. According to surveys of the American Society of Cataract and Refractive Surgery membership by Dr David Leaming, phacoemulsification is now the procedure of choice for over 98 percent of the surgeons surveyed.

The reasons for phacoemulsification’s growing popularity are multifactorial including the enhanced safety, efficacy and efficiency of the procedure. Phacoemulsification surgery allows the smallest incision for cataract removal reducing inflammation and postoperative pain, providing more rapid visual recovery and minimizing restrictions on the patient’s physical activities in the early postoperative period. The procedure is very efficient and many surgeons perform four to six procedures per hour in a single operating room surgery center reducing the cost per case significantly. The primary concerns surrounding phacoemulsification have always been related to its complication rate, including potential endothelial cell loss, iris damage and capsular tear/vitreous loss. Forty years of incremental improvements in surgical technique and technology now allow the master surgeon to provide the patient all the benefits of phacoemulsification surgery with an ever lower complication rate. The development of foldable intraocular lenses which can be implanted through 1 to 3 mm incisions has also accelerated the popularity of phacoemulsification. Phacoemulsification with the implantation of a foldable intraocular lens provides society, the surgeon and the patient with an extraordinarily safe, effective and efficient operation for the restoration of vision in the face of cataract.

Recently, new intraocular lens implants including aspheric optic, accommodative, and multifocal combined with quality biometry and astigmatism management allow the phacoemulsification surgeon not only to restore but also enhance the best corrected and uncorrected vision of their patient to levels not even imaginable when phacoemulsification was first developed.

Success in phacoemulsification requires the proper tools and technology. Major advances in phacoemulsification machines include improvement in both power modulation and fluidics. These advances have allowed the evolution of techniques which generate much less energy and turbulence inside the eye. In addition, surgeons can now utilize two-port and three-port bimanual microincision cataract surgical technique, co-axial microincision cataract surgical technique or standard co-axial phacoemulsification through incisions in the 1.5 to 3.0 mm range. Equally important, surgical technique continues to advance including hydrodissection, hydrodelineation, continuous curvilinear capsulorhexis, more advanced approaches to nuclear disassembly including divide and conquer, stop and chop, phaco chop, and supracapsular phacoemulsification providing surgeons with ever safer, more effective and more efficient approaches to the removal of cataract. Multiple energy sources including ultrasound, sonic mode, waterjet and laser, as well as classical longitudinal and the newer torsionable phacoemulsification compete for the surgeon’s attention. The field continues to evolve always emphasizing safety, efficacy and efficiency.
Internationally known Dr Ashok Garg, and his coeditors have prepared a masterful offering on the current art of phacoemulsification surgery in their book *Mastering the Phacodynamics (Tools, Technology and Innovations)*. They include an interactive DVD which will also serve as an excellent educational resource for the surgeon who acquires this book. The content is inclusive and the authors excellent. This book will make an important contribution to the continuing medical education of current and future phacoemulsification surgeon.

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Phacoemulsification and microphaco in order to be performed well require a complete understanding of the fluid mechanics as well as machine parameters. In order to achieve best surgical results and patient satisfaction it is mandatory to understand the basic principles of phacodynamics. Phacodynamics is defined as the study of the fundamental principles underlying not only the machine technology but also the individual microsurgical maneuvers. It is the study of fundamental principles of flow rate, vacuum, phaco power modulations (machine parameters) in context to different types and grades of cataracts. All these factors are highly dependent on one another and are deeply interwined and each has to be adjusted in context with the others. Even the latest parameters will not give desired results if the principles of phacodynamics are not adhered to. Three main steps of phacodynamics (fluidics, power modulations and surge prevention) should be mastered to achieve optimal desired results.

This mega International Book on Mastering the Phacodynamics in its most advanced presentation, is a dedicated effort to spread knowledge and to provide finer details of phaco parameters. A notable feature of this book is, that a galaxy of Top International Phaco and Microphaco experts serving the people with great dedication in different parts of the world have shared their skills and experiences about phacodynamics in this book.

Sixty-three chapters of this book written by leading International Phacodynamics expert cover all aspects of the subject from history of phacoemulsification to various phacodynamics step minutely, complications management, recent advances and future prospects. A surgical DVD is also being provided with the book showing various phacodynamics step and parameters by leading International Masters of this field.

The entire Jaypee Brothers Publishing team has been a delight to work with. They are truly professionals and hard working. We are specially grateful to Shri Jitendar P Vij (CEO), Mr. Tarun Duneja (General Manager, Publishing) and all staff members who took keen interest in this project and never ruffled to prepare this mega book in a short time. Each contributing author in this book has made every effort to shape this book as an indispensable companion to ophthalmologists.

We are hopeful that this book with surgical DVD a complete Phacodynamic textbook at an international level and most complete educational format possible shall provide complete uptodate information about Phacodynamics to our readers.

Editors
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