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Emerging Techniques and Technology

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Since Robert Machemer, MD, first pioneered closed-eye vitrectomy, the evolution of vitrectomy surgery has rapidly progressed. Numerous advances in the technologies and techniques have been made for the establishment and refinement of this surgical modality. Of these, enormous advances in minimizing the size of the surgical equipment for carrying out sutureless vitrectomy may be the most remarkable advancement in modern vitrectomy surgery. Visualization techniques have also made huge progress, i.e. the introduction of wide-viewing systems in conjunction with chandelier illumination and the utilization of vital dyes to better visualize transparent intraocular tissue such as the vitreous and membranes. Thanks to the recent advancements, we can now routinely achieve less invasive surgery and consequently have earlier recovery with improved safety.

This volume starts with the fundamentals of microincision vitrectomy surgery by introducing both the mechanics and the physics of the newer-generation vitrectomy machines. The following chapters describe the discrete gauge systems, namely the 23-, 25-, and – the latest – 27-gauge systems. In the second section, both individualized and requisite settings, techniques, and technology are discussed in detail. These include illumination, wide-viewing systems, and surgical adjuvants. The third section focuses on the practical management of specific diseases, and includes more than 10 chapters dedicated to giving surgeons thorough plans with concrete strategies.

Since the development of microincision vitrectomy surgery continues at a dizzying pace, our principal endeavor is to encompass all of the recent advancements obtained in this field so that both comprehensive ophthalmologists and vitreoretinal specialists can quickly review and catch up with the most up-to-date knowledge and have some surgical pearls as well. We wish all readers enjoyment with this book, which can be used as a quick reference for specific diseases and as a sophisticated guide to understand the latest advances in vitreous surgery technology.

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Yusuke Oshima, Osaka
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