
Essentials in Ophthalmology

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Diseases of the Vitreo-Macular Interface

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Foreword

Normal posterior vitreous detachment (PVD) occurs in everyone as we mature, but occasionally this natural process runs array and an anomalous PVD is produced leading to vitreo-macular interface (VMI) disorders. Without optical coherence tomography (OCT), our understanding of this phenomenon was limited. The advent of OCT and in small part ultrasonography has given us better insight into VMI disorders. This excellent text explores this phenomenon and its consequences in great detail. Moreover, in the past, we had only two options to treat the problem—observation and surgery. The recent approval of a vitreolysis agent has added another arrow to our quiver to attack VMI disease and its consequences. In the future, other agents or a cocktail of agents may further improve our ability to treat these common conditions.

Drs. Girach and de Smet have compiled an exceptional list of contributors who are experts in the field and who have been researching various facets of VMI diseases for years. This book begins with an overview of the disease and how it affects patients. Next, vitreous biochemistry and the pathophysiology of the vitreo-macular interface are explored. Importantly, best practices on imaging the various VMI disorders are explored in detail. Finally, methods to treat VMI disorders are discussed. Both current and future options are addressed. After reading this text, readers will have a complete understanding of VMI disorders. We are indebted to the editors and authors for delivering this much-needed reference on VMI, the first text of its kind dealing with a common potentially sight-threatening disorder.

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Peter K. Kaiser, MD

Preface

The eye is a wondrous organ. It is derived from all primeval layers of the developing embryo, each of its parts having developed specific functions constrained by the requirements of a developing eye, the provision of vision, and structural integrity over a whole lifetime of use. Of all the components present in the eye, none occupies more space than the vitreous. Little was known or written about its nature or function such that no earlier than a decade ago, people would debate its use, necessity, and role in retinal pathology. The fact that eyes function well without vitreous and our inability to visualize the vitreous and its interface with the retina until recently are largely responsible for our lack of understanding, but this is changing rapidly.

The vitreous cavity contains a physical transparent structure rather than only a liquid, suggesting usefulness and purpose for at least a portion of an eye's life cycle. Clearly, it can absorb a shock delivered to the globe, prevent complete collapse in the case of penetrating or perforating trauma, and constrain the advancement of certain infections such as fungi. With time, exposure to light, oxidative, metabolic, and mechanical stresses leads to the condensation of collagen fibers, liquefaction, and collapse of the vitreous body. The vitreous separates from its insertion onto the retina, starting a new phase of its career, allowing increased oxygenation to the retina and less structural support. This process of vitreolysis and posterior vitreous detachment is a slow process taking years to evolve. During this time, vitreo-macular and vitreoretinal traction can lead to pathological changes sometimes with dire consequences for vision and the integrity of the retina. We are just discovering the full scope of these tractional pathologies. Indeed it is only in 2011 that the international classification of diseases (ICD) recognized vitreo-macular traction as a separate entity with its own code. Such increased awareness of disease is not possible without considerable research. Indeed, our understanding of the biochemistry, physiology, and aging of normal vitreous has allowed us to better comprehend the steps leading to pathologic states. Strides made in the noninvasive imaging of ocular tissue have allowed us to visualize the consequences of vitreo-macular traction and follow it over time. Therapeutic strategies are being developed.

Despite all this activity, no book or monograph has ever been written on the vitreo-macular interface (VMI). Such a void needed to be filled. At the outset, we wanted to credit visionaries who studied the vitreous when no one else showed interest and provide current and future researchers with a valuable reference on VMI. This book begins with the anatomy, physiology,

and aging changes of the interface. We look into the pathologic implications of anomalous adhesions, its clinical manifestations, and report on the prevalence and incidence of various pathologic states. No book on the subject would be complete without due attention to imaging and its challenges and in particular possible venues to improve our ability to visualize and understand the vitreo-macular interface. Treatment strategies are appearing, even non-surgical approaches. We gave ample space to report on achievements on the various venues imagined and explored to solve the adhesion using a non-surgical approach. All known approaches whether successful, promising, or abandoned have been considered. Next, the challenges faced by clinical trials in this field are outlined so that future research can be facilitated. Finally, we consider what we have learned so far and how it can be applied to improve our future diagnostic and therapeutic abilities.

It is our hope that this book will be of use to all those fascinated, as we are, by the vitreo-macular interface—the basic scientist seeking to understand the intricacies of a barely visible tissue, the clinician faced with the challenges of patients whose VMI traction may lead to vision loss, imaging engineers, pharmacologists, and chemists. We hope to have sparked a better understanding and a foundation for future research.

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Contents

1 Introduction: Unmet Medical Need	1
Colin A. McCannel and Donald S. Fong	
2 The Epidemiology of Vitreo-macular Interface Diseases	7
Andrew R.H. Simpson and Timothy L. Jackson	
3 Anatomy and Physiology of the Vitreo-macular Interface	21
Amitha Domalpally, Sapna Gangaputra, and Ronald P. Danis	
4 Pathophysiology of the Aging Vitreous	29
J. Sebag	
5 Pathophysiology of Vitreo-Macular Interface	43
Ricarda Gisela Schumann and Arnd Gandorfer	
6 Imaging of the Vitreo-macular Interface	55
Carl Glittenberg and Susanne Binder	
7 Clinical Manifestations of Vitreo-macular Interface Disease	67
Roy M. Arogyasami and Pravin U. Dugel	
8 Vitreo-macular Traction and Age-Related Macular Degeneration	77
Susanne Binder and Ilse Krebs	
9 Treatment Paradigm for Vitreo-macular Interface Diseases	83
Matteo Cereda	
10 Pharmacologic Vitreolysis: Experimental Evidence	95
Marc D. de Smet and Aranzazu Mateo-Montoya	
11 Pharmacologic Vitreolysis: Clinical Trial Data	105
Steve Pakola and Julia A. Haller	
12 Pharmacologic Vitreolysis: New Perspectives, Future Directions	113
Marc D. de Smet and Baruch D. Kuppermann	
Index	119