

# Contents

|            |  |             |  |
|------------|--|-------------|--|
| <b>1</b>   | <b>Common Characteristics<br/>and Distinct Features<br/>of Human Pathogenic Herpesviruses</b> ..... 1<br><br><b>Hartmut Hengel</b> | <b>2.5</b>  | <b>Epithelial HSV Keratitis</b> ..... 29                                 |
| 1.1        | Hallmarks of Herpesvirus Infections ..... 1  | <b>2.6</b>  | <b>Interstitial<br/>and Ulcerating HSV Keratitis</b> ..... 39            |
| 1.2        | Virus Taxonomy<br>and Herpesviral Subfamilies ..... 1  | <b>2.7</b>  | <b>HSV Endotheliitis<br/>and Disciform Keratitis</b> ..... 51            |
| 1.3        | General Themes<br>of Human Herpesvirus Infections ..... 2  | <b>2.8</b>  | <b>HSV Trabeculitis<br/>and Acute Secondary Glaucoma</b> ..... 57        |
| 1.4        | Distinct Features<br>of Human Herpesviruses ..... 2  | <b>2.9</b>  | <b>HSV Focal Serous Iritis</b> ..... 63                                  |
| <b>2</b>   | <b>Herpes Simplex Virus (HSV) Diseases<br/>of the Anterior Segment and the Adnexa</b> ..... 5<br><br><b>Rainer Sundmacher</b>      | <b>2.10</b> | <b>HSV Scleritis</b> ..... 69  |
| <b>2.1</b> | <b>Pathophysiology</b> ..... 7   | <b>2.11</b> | <b>Metaherptic Corneal Disease</b> ..... 71                              |
| <b>2.2</b> | <b>Basics of Therapy</b> ..... 13  | <b>2.12</b> | <b>Clinically Manifest<br/>Primary HSV Infections</b> ..... 77           |
| 2.2.A      | Antiviral Agents for Superficial<br>(Epithelial) Viral Disease ..... 13  | <b>2.13</b> | <b>Herpes and Trauma</b> ..... 83  |
| 2.2.A.1    | Trifluorothymidine (TFT)<br>and Aciclovir (ACV) ..... 14   | <b>2.14</b> | <b>Intraocular Surgery<br/>and Keratoplasty in HSV Eyes</b> ..... 87     |
| 2.2.A.2    | Bromovinyldeoxyuridine (BVDU),<br>a Potential Alternative ..... 15   | 2.14.A      | General Rules for Surgery in Herpes Eyes .. 87                           |
| 2.2.A.3    | The Lasting Value of Mechanical<br>Debridement ..... 15  | 2.14.A.1    | Systemic ACV Prophylaxis<br>and Therapy of Herpes Complications ..... 87 |
| 2.2.A.4    | The Potential Value of Topical Interferon<br>in Combination with Topical Antiviral<br>Agents ..... 16                              | 2.14.A.2    | Cataract and Glaucoma Surgery ..... 87                                   |
| 2.2.B      | Antiviral Agents Plus Steroids<br>for Deep Viral Disease ..... 17  | 2.14.B      | Emergency Surgery<br>with Different Tissue Covers ..... 88               |
| 2.2.C      | Conservative Resurfacing Measures<br>for Metaherptic Superficial (Epithelial)<br>Disease ..... 17                                  | 2.14.B.1    | Conjunctiva ..... 88   |
| 2.2.D      | Surgical Reconstruction<br>for Metaherptic Deep Disease ..... 18   | 2.14.B.2    | Cornea ..... 88  |
| <b>2.3</b> | <b>HSV Blepharitis</b> ..... 21  | 2.14.B.3    | Amnion ..... 89  |
| <b>2.4</b> | <b>HSV Conjunctivitis</b> ..... 25   | 2.14.C      | Optical Improvement<br>of an Irregular Corneal Surface ..... 91          |
|            |  | 2.14.C.1    | Contact Lenses ..... 91  |
|            |  | 2.14.C.2    | Excimer Laser ..... 92   |
|            |  | 2.14.D      | Perforating Keratoplasty ..... 92  |
|            |  | 2.14.D.1    | Rotational Autokeratoplasty ..... 93                                     |
|            |  | 2.14.D.2    | Homokeratoplasty ..... 93  |
|            |  | 2.14.D.2.1  | Dry Eye Complications ..... 96   |
|            |  | 2.14.D.2.2  | Immune Reactions ..... 96  |
|            |  | 2.14.D.2.3  | HSV Recurrences ..... 100  |
|            |  | 2.14.D.2.4  | Secondary Glaucoma ..... 104   |

|  |     |   |   |     |
|--|-----|---|---|-----|
| 2.14.D.2.5 Irritating Sutures .....  | 105 | 4   | <b>Cytomegalovirus (CMV) Diseases of the Anterior Segment .....</b> | 159 |
| 2.14.E Special Problem: Amebic Keratitis .....   | 106 |   | <b>Rainer Sundmacher and Johannes Stammen</b>                       |     |
| <b>2.15 Prophylaxis of HSV Recurrences .....</b>   | 111 |   |   |     |
| <br>   |     |   |   |     |
| <b>3 Varicella Zoster Virus (VZV) Diseases of the Anterior Segment and the Adnexes .....</b> | 113 | <b>5 Suspected Epstein–Barr Virus (EBV) Disease of the Anterior Segment .....</b> | 163   |     |
| Rainer Sundmacher  |     | <b>Thomas Reinhard</b>  |   |     |
| <b>3.1 Zoster Pathophysiology and Therapy .....</b>  | 115 | 5.1 General Pathophysiology and Epidemiology .....                                | 163   |     |
| Pathophysiology .....  |     | 5.2 Laboratory Diagnosis .....  | 163   |     |
| Therapy .....  |     | 5.3 Ocular Manifestations .....   | 164   |     |
| <b>3.2 Ocular Disease in the Course of Primary VZV Infection (Varicella) .....</b>           | 119 | 5.4 Therapy of Recurrent EBV Disease of the Eye .....                             | 165   |     |
| <b>3.3 Zoster Blepharitis, Conjunctivitis, and General VZV Dissemination .....</b>           | 123 | <br>  |   |     |
| <b>3.4 Epithelial Zoster Keratitis .....</b>   | 129 | <b>6 Diseases of the Posterior Segment by HSV, VZV, and CMV .....</b>             | 167   |     |
| <b>3.5 Interstitial Zoster Keratitis and Endotheliitis .....</b>                             | 131 | <b>Lutz L. Hansen</b>   |   |     |
| Addendum .....   |     | 6.1 Epidemiology and Pathogenesis .....   | 167   |     |
| <b>3.6 Zoster Iritis .....</b>   | 141 | 6.2 Phenotypic Clinical Features .....  | 167   |     |
| <b>3.7 Zoster Scleritis .....</b>  | 145 | 6.2.1 Herpetic Retinitis .....  | 167   |     |
| <b>3.8 Late Corneal Complications After Zoster .....</b>                                     | 147 | 6.2.2 Acute Retinal Necrosis (ARN) .....  | 168   |     |
| <b>3.9 Keratoplasty in Zoster Eyes .....</b>   | 151 | 6.2.3 Progressive Outer Retinal Necrosis (PORN) .....                             | 168   |     |
| <b>3.10 Differences Between VZV and HSV Ocular Disease .....</b>                             | 155 | 6.3 Virus Specific Features .....   | 168   |     |
|  |     | 6.3.1 Herpes Simplex Virus (HSV) .....  | 168   |     |
|  |     | 6.3.2 Varicella Zoster Virus (VZV) .....  | 169   |     |
|  |     | 6.3.3 Cytomegalovirus (CMV) .....   | 169   |     |
|  |     | 6.3.4 Epstein–Barr Virus (EBV) .....  | 169   |     |
|  |     | 6.4 Diagnosis and Differential Diagnosis .....                                    | 169   |     |
|  |     | 6.5 Therapy .....   | 170   |     |
|  |     | 6.5.1 General Guidelines .....  | 170   |     |
|  |     | 6.5.2 Herpetic Retinitis .....  | 171   |     |
|  |     | 6.5.3 Cytomegalovirus Retinitis .....   | 171   |     |
|  |     | 6.5.4 Acute Retinal Necrosis .....  | 171   |     |
|  |     | 6.5.5 Progressive Outer Retinal Necrosis .....                                    | 171   |     |
|  |     | 6.5.6 Retinal Detachment .....  | 172   |     |
| <br>   |     |   |   |     |
| <b>Subject Index .....</b>   |     |   |   | 183 |