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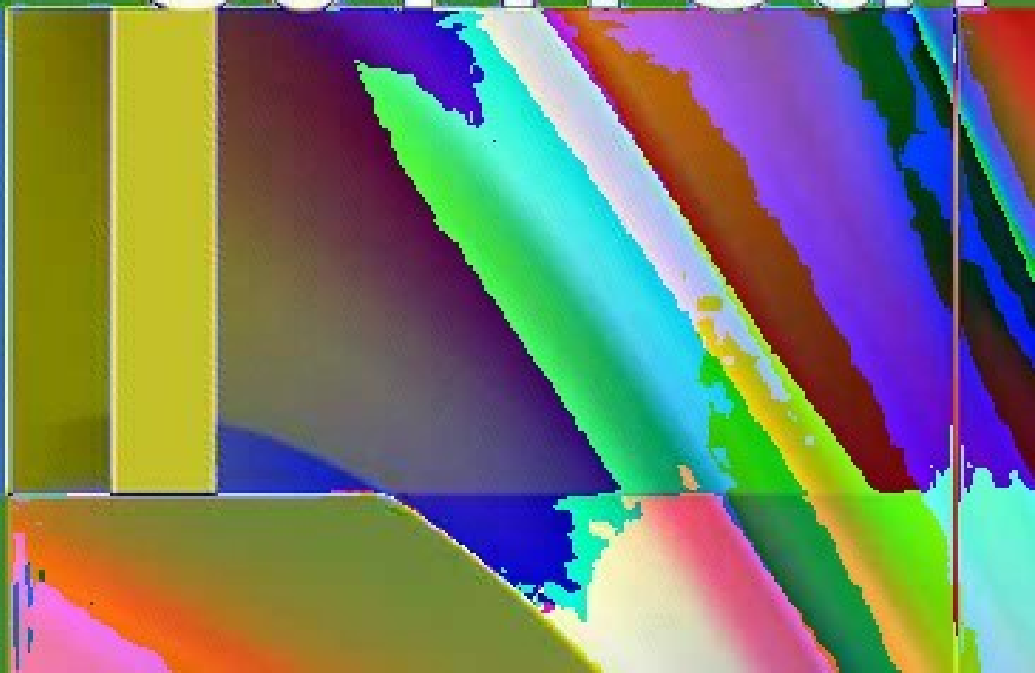

Corneal Disease

Thomas Reinhard • Frank Larkin
Editors

Corneal Disease

Recent Developments in Diagnosis and Therapy

Springer

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Preface

In this edition we have gathered a number of chapters on diagnosis and management of corneal disorders.

Miller, Girgis, Karp and Alfonso discuss mycobacterial keratitis, uncommon but increasingly encountered following ocular surgery or trauma. Diagnosis and medical therapy remain challenging for this infection.

Sueke, Horsburgh, Gilbert, Shankar, Neal and Kaye present a pragmatic approach to antibacterial chemotherapy in keratitis. Corneal specialists working in referral clinics will be particularly interested in their forward look to new antibacterial agents.

While familial keratoconus is very uncommon in Europe and North America, there is an increasing interest in information we can discover on keratoconus pathogenesis from apparently unaffected relatives with subclinical ectasia signs. Willoughby and Lechner review their own work and the recent published literature.

Imaging techniques have become a valuable component in diagnosis of corneal diseases, ranging from infections to corneal dystrophies. Labbé, Denoyer and Baudouin further show that confocal microscopy and ocular coherence tomography may facilitate clinical follow-up after corneal surgery.

Cursiefen and Bock discriminate between haem- and lymph-angiogenesis. They demonstrate that novel anti-angiogenic agents directed at blood or lymph vessels can significantly improve allograft survival by regression of corneal vessels pre- as well as post- transplantation.

For keratoplasty it is vital that corneal surgeons have access to cornea banks with robust and effective quality and risk management systems. Pels and Pollock illustrate that this is especially true in respect to the increasing practice of eye bank preparation of donor posterior lamellar cornea for endothelial keratoplasty procedures.

Few corneal surgeons undertake corneal transplantation in infants with any regularity. Surgical technical and post-operative management challenges in this transplant recipient group are very different to older patients, as Kim and Rootman describe. We expect that David Rootman's comparatively huge experience in infant keratoplasty will be a useful reference to those readers faced with occasional infant candidates for surgery.

We hope you enjoy reading this book.

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New Aspects in the Diagnosis and Therapy of Mycobacterial Keratitis

1

Darlene Miller, Dalia Girgis, Carol Karp, and Eduardo C. Alfonso

Core Messages

- Mycobacterial keratitis is a rare but sight-threatening infection caused by both slow growing (Runyoun Groups I-III) and rapid growing (Runyoun Group IV) members of the genus Mycobacterium following trauma or ocular surgery.
- Mycobacteria are aerobic, nonmotile, nonspore-forming bacilli, ubiquitous in nature and difficult to eradicate with common disinfectants and topical antimicrobials due to the high lipid content of their cell walls.
- Delay in clinical and laboratory diagnosis and confirmation contributes to the protracted clinical course associated with the disease.
- Medical therapy and management remain a challenge.
- Surgical intervention is often required to cure and control the disease.

Mycobacterial keratitis is a rare event [1]. In general, infection rates constitute less than 2% of reported infectious microbial keratitis cases [2, 3]. Rates may vary by geographical locations and have been as high as 8% in some reported series from Asia (Reddy, Lalthia, Huang). Trends in recovery of mycobacteria from keratitis increased in number and diversity in the last decade (Fig. 1.1 and Table 1.1). Disease recognition, confirmation and management, however, remain challenging. Clinical diagnosis is problematic due to delay in presentation, low index of suspicion, mimicry of fungal or viral keratitis, and prior antibiotic and/or corticosteroid therapy. Traditional risk factors have included trauma with metal objects, soil and/or

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vegetable matter or following surgical interventions such as radial keratotomy, photorefractive keratectomy, cataract surgery, or contact lens wear (Fig. 1.2). Current and emerging risk factors are mainly health care related and include surgical procedures (LASIK, LASEK, DSEK), smart plugs, and other biomaterials (Fig. 1.3). In several patients, no identifiable risk factor has been documented [4–7].

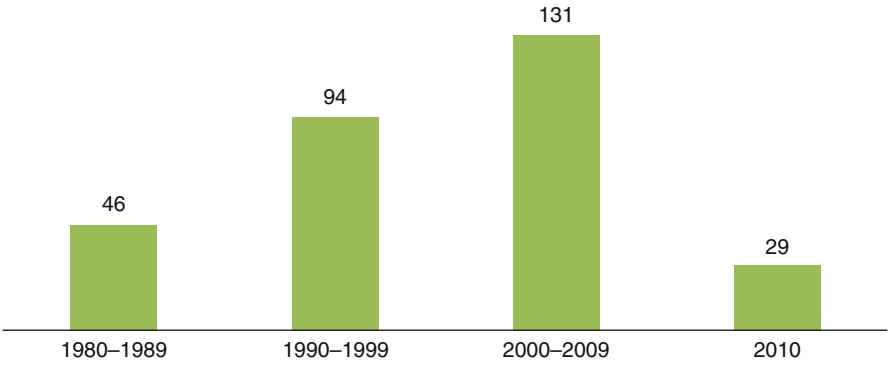

Fig. 1.1 Trends in mycobacterial keratitis cases (literature)

Table 1.1 Frequency and diversity of mycobacterial species recovered from keratitis (published reports 1980–2010), $N = 300$

Mycobacteria classification	Sample source		Isolates	
Runyon group	LASIK flap, cornea bed	Non-LASIK scrapings, biopsy	# of isolates	% of isolates
Group I – Photochromogens (Slow growing >7 days for colonies to appear on solid media after subculture; pigment upon light exposure)				
M. asiaticum		1	1	0.33
M. marinum		1	1	0.33
Total	0	2	2	0.66
Group II – Scotochromogens (Slow growing-pigment in dark or light)				
M. flavescens		1	1	0.33
M. gordonae	2	3	5	1.67
M. szulgai	7	1	8	2.67
Total	9	5	14	4.67
Group III – Nonchromogens (Slow growing; nonpigmented)				
M. avium complex	0	2	2	0.67
M. nonchromogenicum	0	1	1	0.33
M. terrae	1		1	0.33
M. triviale	0	1	1	0.33
Total	1	4	5	1.67

Table 1.1 (continued)

Mycobacteria classification	Sample source		Isolates	
Runyon group	LASIK flap, cornea bed	Non-LASIK scrapings, biopsy	# of isolates	% of isolates
Group IV – Rapid Growers (<7 days for colonies to appear on solid media after subculture)				
M. abscessus	7	15	22	7.33
M. chelonae	37	123	130	53.33
M. fortuitum	4	38	42	14.00
M. immunogenum	5	0	5	1.67
M. immnogenum	2	0	2	0.67
M. smegmatis	0	1	1	0.33
Total	55	177	232	77.33
Nontuberculosis Mycobacteria, not otherwise speciated (*NTM*, *NOS*)	*5*	*42*	*47*	*15.67*
Total isolates	70	230	300	
% of isolates	23.33	76.67		

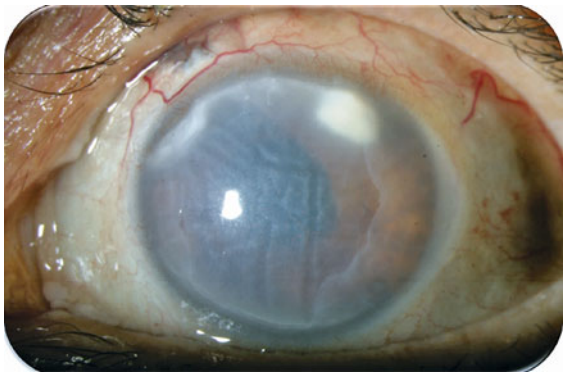

Fig. 1.2 *M. chelonae* mycobacteria following CE/IOL/trabectomy

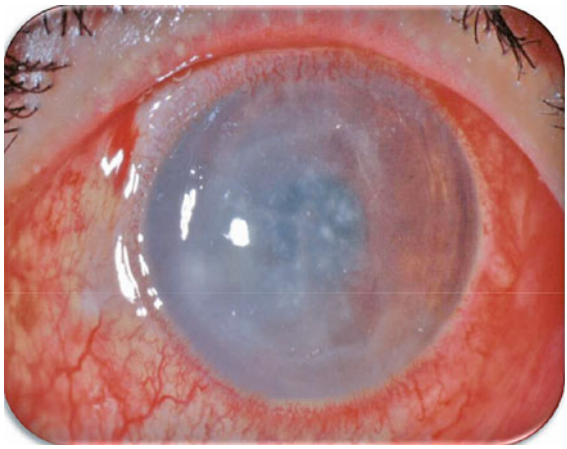

Fig. 1.3 Post LASIK *Mycobacteria abscessus* keratitis