

Acanthameba keratitis: How not to miss the diagnosis

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The worry



Auckland

2001 - 2008		2009 - 2016
41 days	Time to diagnosis (from presentation)	14 days
6/24	Final BCVA	6/12
24%	Surgical intervention	7%

The rising tide of Acanthamoeba keratitis in Auckland, New Zealand: a 7-year review of presentation, diagnosis and outcomes (2009-2016). McKelvie J, Alshaiikh M, Zaei M, Patel DV, McSheeh CN. Clin Exp Ophthalmol. 2018 Aug;46(5):500-507.

The great Masquerade

- Early cases**
- Epithelial herpetic keratitis
 - Healing corneal abrasion/recurrent erosion
 - Neurotrophic keratopathy
 - Toxic epitheliopathy
- Late cases**
- Stromal herpetic keratitis
 - Fungal keratitis

Asking the right questions

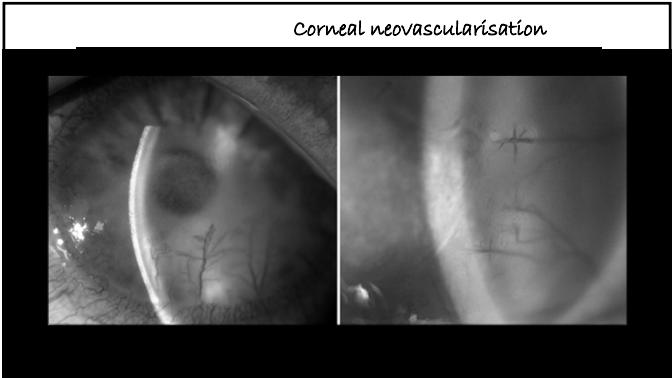
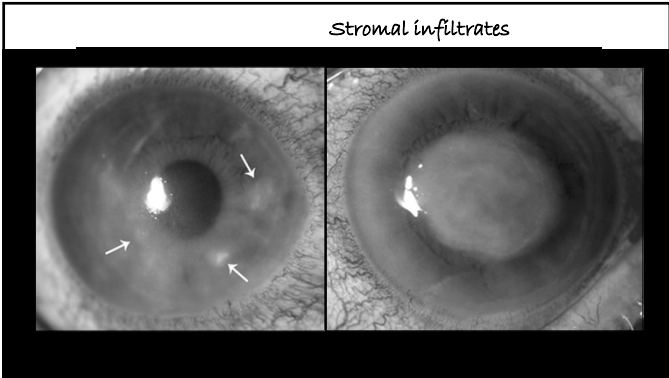
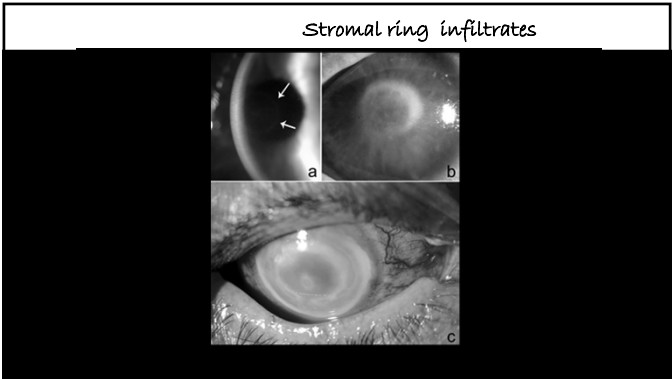
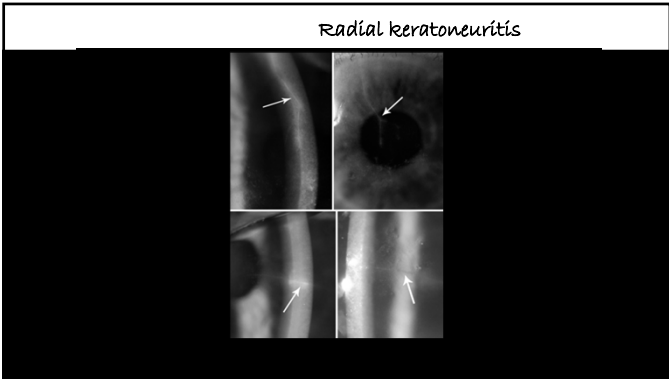
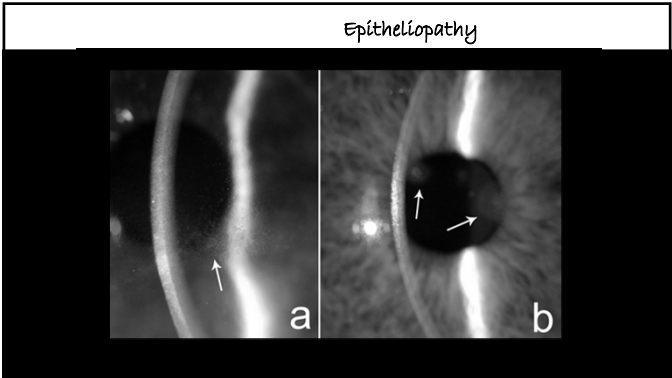
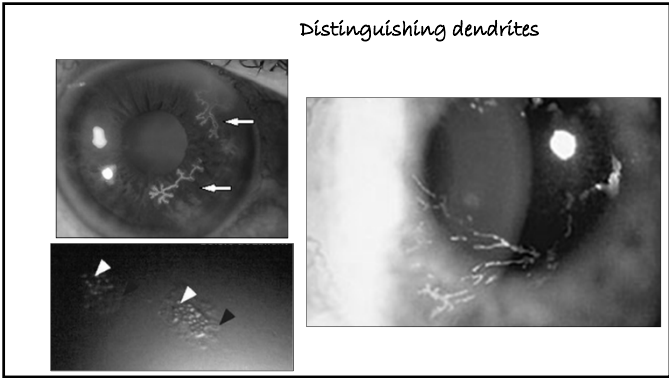
- History is key
- 70-90% of diagnoses made by history alone
- Contact lens wear: type, duration, cleaning system
- Water exposure: hot tub, swimming pool, river, water tank
- Ocular trauma
- Cold sores
- Shingles
- Previous episodes
- Diabetes Mellitus
- Eye drops – prescribed or borrowed

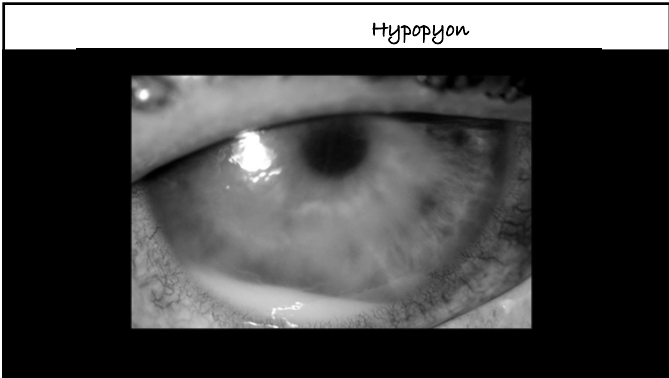
- 96% CL wear
- Mean duration of symptoms at presentation = 21 days

- Auckland: Initial diagnosis
 - “Contact lens keratitis” 70.6%
 - Viral keratitis 15.5%
 - Acanthamoeba keratitis 12%



- London
- 49% on antiviral agent
- Misdiagnosis as HSV associated with poorer outcomes





Corticosteroids

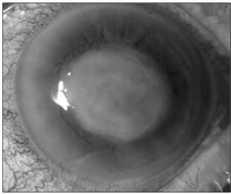
On topical corticosteroids before diagnosis

Auckland

- 2001-2008 56%
- 2009-2016 10.3%

London

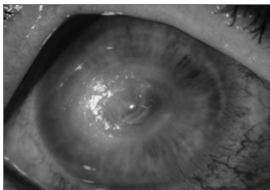
- 200 – 2012 46%
- Associated with poorer outcomes



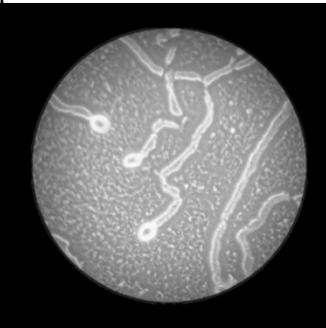
Corticosteroids

.....the bad and the ugly

- Deleterious in the absence of appropriate anti-infective agent
- Accelerate trophozoite multiplication
- Delayed epithelialisation
- Accelerated stromal loss
- Increased risk of perforation



Microbiology




Corneal scrape
Positive in 27%
Reported 9.4 days

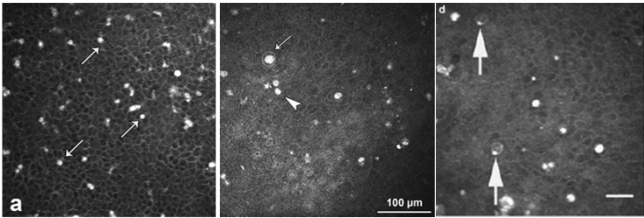
Corneal biopsy
Positive in 33%

In vivo confocal microscopy

- Immediate diagnosis
- Non-invasive
- Multiple examinations over time
- Acanthamoeba keratitis
- Fungal keratitis
- Useful but not perfect



In vivo confocal microscopy



Leukocytes

Double walled cyst

Signet ring

IVCM accuracy

- Variability in reported sensitivity and specificity
- Differences in
 - Type of IVC
 - Diagnostic criteria
 - Reference standard
 - Masking
 - Observer experience

Study	Diagnostic criteria	Sensitivity	Specificity	Masked observers	Observer experience
1	IVCM on corneal scrapings, on slides	82.5%	77.5%	No	Experienced
2	Corneal scrapings, on IVCs	100%	84%	Not reported	Not reported
3	IVCM on corneal scrapings, on slides	100%	100%	Not reported	Experienced
4	IVCM on corneal scrapings, on slides	100%	100%	Not reported	Experienced
5	IVCM on corneal scrapings, on slides	100%	100%	Not reported	Experienced
6	IVCM on corneal scrapings, on slides	100%	100%	Not reported	Experienced
7	IVCM on corneal scrapings, on slides	100%	100%	Not reported	Experienced
8	IVCM on corneal scrapings, on slides	100%	100%	Not reported	Experienced
9	IVCM on corneal scrapings, on slides	100%	100%	Not reported	Experienced
10	IVCM on corneal scrapings, on slides	100%	100%	Not reported	Experienced
11	IVCM on corneal scrapings, on slides	100%	100%	Not reported	Experienced
12	IVCM on corneal scrapings, on slides	100%	100%	Not reported	Experienced
13	IVCM on corneal scrapings, on slides	100%	100%	Not reported	Experienced
14	IVCM on corneal scrapings, on slides	100%	100%	Not reported	Experienced
15	IVCM on corneal scrapings, on slides	100%	100%	Not reported	Experienced
16	IVCM on corneal scrapings, on slides	100%	100%	Not reported	Experienced
17	IVCM on corneal scrapings, on slides	100%	100%	Not reported	Experienced
18	IVCM on corneal scrapings, on slides	100%	100%	Not reported	Experienced
19	IVCM on corneal scrapings, on slides	100%	100%	Not reported	Experienced
20	IVCM on corneal scrapings, on slides	100%	100%	Not reported	Experienced

Treatment of acanthamoeba

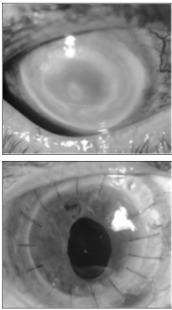
- Successful treatment requires:
- Early diagnosis
 - Topical agents:
 - Propamidine Isethionate 0.1% [Brolene] and one of
 - Polyhexamethylene biguanide 0.02% [PHMB]
 - Chlorhexidine 0.02-0.04%
 - Aggressive therapy

Treatment duration

- Clinical response to treatment may take two weeks or more
- Risk of toxic keratopathy
- Mean duration of treatment 6 months

Prognosis

- Poor prognostic factors
- Time to diagnosis > 3 weeks
 - Initial misdiagnosis as HSV
 - Corticosteroids before diagnosis
 - Stromal ring infiltrates or scleritis



Conclusions

- Diagnostic challenge
- Clinical suspicion is most important
- Corneal scrape/culture is essential (but poor yield)
- IVC useful but not perfect
- Delayed diagnosis associated with poor outcomes

Thank you

