Filamentary Keratitis/Keratopathy

- *In this context, what are filaments?*
Filamentary Keratitis/Keratopathy

- *In this context, what are filaments?* Strands of devitalized epithelial cells and mucus attached to the corneal surface
Filamentary Keratitis/Keratopathy

Filaments
In this context, what are filaments? Strands of devitalized epithelial cells and mucus attached to the corneal surface.

There’s ‘attached,’ and there’s *attached*. Here are two questions to determine just how attached to the cornea filaments really are…

*First, do filaments remain attached through a blink?*
In this context, what are filaments? Strands of devitalized epithelial cells and mucus *attached* to the corneal surface.

There’s ‘attached,’ and there’s *attached*. Here are two questions to determine just how attached to the cornea filaments really are…

*First, do filaments remain attached through a blink?*
Yes (except…more shortly)
Filamentary Keratitis/Keratopathy

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There’s ‘attached,’ and there’s attached. Here are two questions to determine just how attached to the cornea filaments really are…

First, do filaments remain attached through a blink?
Yes (except…more shortly)

OK, now the true test of corneal attachment: When a filament is removed, does it leave an epi defect?
Filamentary Keratitis/Keratopathy

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There’s ‘attached,’ and there’s attached. Here are two questions to determine just how attached to the cornea filaments really are…

First, do filaments remain attached through a blink?
Yes (except…more shortly)

OK, now the true test of corneal attachment: When a filament is removed, does it leave an epi defect?
Yes
Filamentary Keratitis/Keratopathy

- *In this context, what are filaments?* Strands of devitalized epithelial cells and mucus attached to the corneal surface
- *What do pts with filaments complain of?*
Filamentary Keratitis/Keratopathy

- In this context, what are filaments? Strands of devitalized epithelial cells and mucus attached to the corneal surface.
- What do pts with filaments complain of? Foreign-body sensation.
In this context, what are filaments? Strands of devitalized epithelial cells and mucus attached to the corneal surface.

What do pts with filaments complain of? Foreign-body sensation.

Time to unpack the except...more shortly from a couple of slides ago. Occasionally, a blink will pull a filament off the cornea, leaving a small epi defect and leading to the FBS that is characteristic of the condition.

**First, do filaments remain attached through a blink?**
Yes (except...more shortly)

**OK, now the true test of corneal attachment: When a filament is removed, does it leave an epi defect?**
Yes
Filamentary Keratitis/Keratopathy

- *In this context, what are filaments?* Strands of devitalized epithelial cells and mucus attached to the corneal surface
- *What do pts with filaments complain of?* Foreign-body sensation
- *What is the key to successfully managing filamentary keratitis?*
Filamentary Keratitis/Keratopathy

- *In this context, what are filaments?* Strands of devitalized epithelial cells and mucus attached to the corneal surface.
- *What do pts with filaments complain of?* Foreign-body sensation.
- *What is the key to successfully managing filamentary keratitis?* Addressing the underlying condition that led to filament formation in the first place!
Filamentary Keratitis/Keratopathy

What might the ‘underlying condition’ be?

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(there are others)

What is the key to successfully managing filamentary keratitis? Addressing the underlying condition that led to filament formation in the first place!

Prolonged surface occlusion (partial or complete)
In this context, what are filaments? Strands of devitalized epithelial cells and mucus attached to the corneal surface.

What do pts with filaments complain of? Foreign-body sensation.

What is the key to successfully managing filamentary keratitis? Addressing the underlying condition that led to filament formation in the first place!

What might the 'underlying condition' be?
--DES
--REE
--SLK
--Medicomentosa
--Prolonged surface exposure
--Prolonged surface occlusion (partial or complete)
--(there are others)
In this context, what are filaments? Strands of devitalized epithelial cells and mucus attached to the corneal surface.

What do pts with filaments complain of?

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Addressing the underlying condition that led to filament formation in the first place!

Filamentary Keratitis/Keratopathy

What does DES stand for in this context?

Dry eye syndrome

What might the ‘underlying condition’ be?

--DES
--REE
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--Prolonged surface exposure
--Prolonged surface occlusion
--(there are others)

What does DES stand for in this context?

Dry eye syndrome

How does DES put a pt at risk for developing filamentary keratitis?

The reduced aqueous tear volume leads to an abnormally high mucin-to-aqueous ratio, which in turn makes the surface milieu much more favorable to filament formation.

What are the two broad categories of dry eye syndrome?

Aqueous tear deficiency (ATD) and evaporative dry eye

Of the two, which is more closely associated with filamentary dz?

ATD
Filamentary Keratitis/Keratopathy

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**Filamentary Keratitis/Keratopathy**

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- REE
- SLK
- Medicomentosa
- Prolonged surface exposure
- Prolonged surface occlusion
- (there are others)

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But ATD and evaporative dry eye are both characterized by reduced aqueous volume, and thus an increased mucin/aqueous ratio. Given this, why is filamentary keratitis more strongly associated with ATD?
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Of the two, which is more closely associated with filamentary keratitis?
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But ATD and evaporative dry eye are **both** characterized by reduced aqueous volume, and thus an increased mucin/aqueous ratio. Given this, why is filamentary keratitis more strongly associated with ATD?
Because in addition to reduced aqueous volume, ATD is characterized by an **increase** in mucin production. Thus, the mucin/aqueous ratio in ATD is even higher than it is in evaporative dry eye.
In this context, what are filaments? Strands of devitalized epithelial cells and mucus attached to the corneal surface.

What do pts with filaments complain of? Foreign-body sensation.

What is the key to successfully managing filamentary keratitis? Addressing the underlying condition that led to filament formation in the first place.

Filamentary Keratitis/Keratopathy

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Which ocular-surface cell produces mucin? Conjunctival goblet cells.
Filamentary Keratitis/Keratopathy

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Because in addition to reduced aqueous volume, ATD is characterized by an increase in mucin production, making the mucin/aqueous ratio even higher than it is in evaporative dry eye.

Which ocular-surface cell produces mucin?
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--Prolonged surface exposure
--Prolonged surface occlusion
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What does REE stand for in this context?

Recurrent epithelial erosions (aka 'recurrent corneal erosions')

What are recurrent epithelial erosions?

Epi defects that repeatedly occur in the same corneal location owing to chronically poor adhesion between the epithelium and the underlying basement membrane.

The majority of REE cases can be traced to one of two causes.

--A history of trauma to the corneal epithelium
--An underlying corneal dystrophy (Of course, a pt could have both)
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What are they?

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**underlying condition**

Filamentary Keratitis/Keratopathy

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--REE--
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--Prolonged surface occlusion (partial or complete)--
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What does REE stand for in this context?
Recurrent epithelial erosions (aka 'recurrent corneal erosions')

What sort of trauma, ie, what type of mechanism?

What are recurrent epithelial erosions?
The majority of REE cases can be traced to one of two causes.

--A history of trauma to the corneal epithelium
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(Of course, a pt could have both)
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What are recurrent epithelial erosions? Epi defects that repeatedly occur in the same corneal location owing to chronically poor adhesion between the epithelium and the underlying basement membrane.

What sort of trauma, ie, what type of mechanism? A ‘shearing’ injury (eg, a scrape from a fingernail). Notably, lacerating injuries do not predispose to REE.

The majority of REE cases can be traced to one of two causes. What are they?
--A history of trauma to the corneal epithelium
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What are recurrent epithelial erosions?
Epi defects that repeatedly occur in the same corneal location owing to chronically poor adhesion between the epithelium and underlying basement membrane.

Which corneal dystrophies are associated with REE?
--A history of trauma to the corneal epithelium--
--An underlying corneal dystrophy--
(Of course, a pt could have both)

The majority of REE cases can be traced to one of two causes.
--A history of trauma to the corneal epithelium--
--An underlying corneal dystrophy--
(Of course, a pt could have both)

Which corneal dystrophies are associated with REE?
The classic cause is probably epithelial basement membrane dystrophy (EBMD). Other, less common causes include Meesmann epithelial corneal dystrophy, Reis-Bücklers, Thiel-Behnke, and lattice and granular stromal dystrophies.
Filamentary Keratitis/Keratopathy

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- DES
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- Prolonged surface occlusion (partial or complete)

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Filamentary Keratitis/Keratopathy

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--DES--

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What are the '6 F's' of EBMD?

---F---

Fibrillar material accumulates under the basement membrane.

What are the '6 F's' of EBMD?

---F---

Filamentary keratitis? Addressing the underlying condition that led to filament formation in the first place!
Filamentary Keratitis/Keratopathy

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What are the '6 F's' of EBMD?
--Female preponderance
--Fifties and older (usually)
--Five to Fifteen percent of the population are afflicted
--Fifty percent of pts who suffer REE have it
--Fibrillar material accumulates under the basement membrane

What does corneal dystrophy mean? A hereditary disease of the corneal stroma or epithelium.
In this context, what are filaments? Strands of devitalized epithelial cells and mucus attached to the corneal surface.

What do pts with filaments complain of?

Foreign-body sensation

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Filamentary Keratitis/Keratopathy

What might the 'underlying condition' be?

--DES--REE--

--SLK

--Medicomentosa--Prolonged surface exposure--Prolonged surface occlusion (partial or complete)--(there are others)

What does SLK stand for in this context?

Superior limbic keratoconjunctivitis

In a nutshell, what is SLK?

A chronic/recurrent inflammatory condition of the superior limbal cornea and adjacent conj

What do SLK pts c/o?

DES-like complaints: Foreign-body sensation; burning

In SLK, filaments tend to be distributed in a particular fashion. What is it?

They are usually limited to the superior cornea

With what systemic condition is SLK associated?

Thyroid disease
In this context, what are filaments? Strands of devitalized epithelial cells and mucus attached to the corneal surface.

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What is the key to successfully managing filamentary keratitis? Addressing the underlying condition that led to filament formation in the first place!

Filamentary Keratitis/Keratopathy

What might the 'underlying condition' be?
--DES--REE--
--Medicomentosa--Prolonged surface exposure--Prolonged surface occlusion (partial or complete)--(there are others)

What does SLK stand for in this context?
Superior limbic keratoconjunctivitis

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SLK: Superior conj injection
Filamentary Keratitis/Keratopathy

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**Filamentary Keratitis/Keratopathy**

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- DES
- REE
- SLK
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Filamentary Keratitis/Keratopathy

SLK: Superior corneal filaments
### Filamentary Keratitis/Keratopathy

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Where on the cornea are filaments located in cases owing to ATD?
Thyroid disease
Filamentary Keratitis/Keratopathy

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Filamentary Keratitis/Keratopathy

What might the 'underlying condition' be?

--DES
--REE
--SLK
--**Medicomentosa**

--Prolonged surface exposure
--Prolonged surface occlusion
--(there are others)

What is the classic drug implicated in inducing filaments?

Anticholinergics

Topical or systemic?

Systemic

What is the proposed mechanism of action?

Suppression of aqueous (tear) production
In this context, what are filaments? Strands of devitalized epithelial cells and mucus attached to the corneal surface. What do pts with filaments complain of? Foreign-body sensation. What is the key to successfully managing filamentary keratitis? Addressing the underlying condition that led to filament formation in the first place! What might the ‘underlying condition’ be? DES, REE, SLK, *Medicomentosa*. What is the classic drug implicated in inducing filaments? Anticholinergics. What is the proposed mechanism of action? Suppression of aqueous (tear) production.
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--Prolonged surface occlusion
--(there are others)

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What might the ‘underlying condition’ be?

-DES
-REE
-SLK
-Medicamentosa

What are some of the causes of ‘prolonged surface exposure’?

- Conditions leading to a decreased blink rate (eg, Parkinsons)
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Filamentary Keratitis/Keratopathy

What might the ‘underlying condition’ be?
--DES
--REE
--SLK
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--Prolonged surface exposure

What are some of the causes of ‘prolonged surface exposure’?
--CN7 palsy
--Conditions leading to a decreased blink rate (eg, Parkinsons)
Filamentary Keratitis/Keratopathy

What might the ‘underlying condition’ be?
--DES
--REE
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--Ptosis
--Patching
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Note that, interestingly, these diametrically opposing situations—too much corneal exposure, or too little—lead to the same clinical outcome!
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What is the common trade name for ophthalmic N-acetylcysteine? Mucomyst.

What property does N-acetylcysteine have that makes it useful in treating filamentary keratitis? That of a mucolytic.

What does Mucomyst smell like? Rotten eggs.
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