• Dendritiform keratopathy: DDx

It’s Dendritiform Keratopathy, Haters

Mnemonic forthcoming…
Dendritiform keratopathy: DDx

- H
- A
- T
- E
- S

- H
- A
- T
- E
- S

The Cornea

Dendrites!
Dendritiform keratopathy: DDx

- H
- A
- T
- E
- S
- H
- A
- T
- E
- S

Start with these, and work down both ‘hates’

The Cornea

H
A
T
E
S,
H
A
T
E
S

Dendrites!
Dendritiform keratopathy: DDx

- HSV
- A T E S
- HZO
- A T E S

The Cornea

 HSV
 H A T E S,
 H Z O
 H A T E S

Dendrites!
Dendritiform keratopathy: DDx
- HSV
- Acanthamoeba
- T
- E
- S
- HZO
- Adenovirus
- T
- E
- S

It's Dendritiform Keratopathy, Haters
Dendritiform keratopathy: DDx

- HSV
- Acanthamoeba
- Topical meds
- E
- S
- HZO
- Adenovirus
- Thygeson’s
- E
- S

It’s Dendritiform Keratopathy, Haters

The Cornea

HSV
Acanthamoeba
Topical meds
E
S,
HZO
Adenovirus
Thygeson’s
E
S

Dendrites!
Dendritiform keratopathy: DDx

- HSV
- Acanthamoeba
- Topical meds
- EBV
- S
- HZO
- Adenovirus
- Thygeson’s
- EBMD

The Cornea

HSV
Acanthamoeba
Topical meds
EBV
S,

HZO
Adenovirus
Thygeson’s
EBMD
S

Dendrites!
Dendritiform keratopathy: DDx

- HSV
- Acanthamoeba
- Topical meds
- EBV
- Soft CL wear
- HZO
- Adenovirus
- Thygeson’s
- EBMD
- Subepithelial deposits

It’s Dendritiform Keratopathy, Haters

The Cornea

HSV
Acanthamoeba
Topical meds
EBV
Soft CL wear,
HZO
Adenovirus
Thygeson’s
EBMD
Sub-epi deposits

Dendrites!
It’s Dendritiform Keratopathy, Haters

The dendrites of herpetic epitheliopathy take stains in a particular manner: The epithelium at the edges of the dendrite stain with rose bengal, while the base of the dendrite stains with fluorescein. It’s important to note that the dendrites associated with these other conditions will generally not take stains the same way.
Dendrites!

It’s Dendritiform Keratopathy, Haters

The dendrites of herpetic epitheliopathy take stains in a particular manner: The epithelium at the edges of the dendrite stain with rose bengal, while the base of the dendrite stains with fluorescein. It’s important to note that the dendrites associated with these other conditions will generally not take stains the same way.

- HSV
- Acanthamoeba
- Topical meds
- EBV
- Soft CL wear
- HZO
- Adenovirus
- Thygeson’s
- EBMD
- Subepithelial deposits
Dendritiform keratopathy: DDx

- HSV
- Acanthamoeba
- **Topical meds**
- EBV
- HZO
- Adenovirus
- Thygeson’s
- EBMD
- Subepithelial deposits

What two classes of meds are especially likely to produce a dendritiform keratitis?

**The Cornea**

- HSV
- Acanthamoeba
- Topical meds
- EBV
- HZO
- Adenovirus
- Thygeson’s
- EBMD
- Sub-epi deposits

Dendrites!
Q/A

It’s Dendritiform Keratopathy, Haters

- Dendritiform keratopathy: DDx
  - HSV
  - Acanthamoeba
  - **Topical meds**
  - EBV
  - HZO
  - Adenovirus
  - Thygeson’s
  - EBMD
  - Subepithelial deposits

What two classes of meds are especially likely to produce a dendritiform keratitis? This class is an anti-infective: This class is an ocular hypotensive:

H O
A denovirus
T hygeson’s
E BMD
S ub-epi deposits
Dendrites!
Dendritiform keratopathy: DDx

- HSV
- Acanthamoeba
- **Topical meds**
- EBV
- HZO
- Adenovirus
- Thygeson’s
- EBMD
- Subepithelial deposits

**What two classes of meds are especially likely to produce a dendritiform keratitis?**
- This class is an anti-infective: **Antivirals**
- This class is an ocular hypotensive: **Beta-blockers**

*It’s Dendritiform Keratopathy, Haters*
Dendritiform keratopathy: DDx

- HSV
- Acanthamoeba
- Topical meds

What specifically about soft CL wear is the culprit?

- Soft CL wear

- HZO
- Adenovirus
- Thygeson’s
- EBMD
- Subepithelial deposits

**The Cornea**

- HSV
- Acanthamoeba
- Topical meds
- EBV
- Soft CL wear
- HZO
- Adenovirus
- Thygeson’s
- EBMD
- Sub-epi deposits

It’s Dendritiform Keratopathy, Haters
Dendritiform keratopathy: DDx

- HSV
- Acanthamoeba
- **Topical meds**

What specifically about soft CL wear is the culprit? The preservative **thimerosal** in the CL solution

- **Soft CL wear**

- HZO
- Adenovirus
- Thygeson’s
- EBMD
- Subepithelial deposits

---

*It’s Dendritiform Keratopathy, Haters*
Dendritiform keratopathy: DDx

- HSV
- Acanthamoeba
- Topical meds

In what key way do the dendrites of Acanthamoeba keratitis differ from those of HSV keratitis?

- HSV dendrites usually have terminal bulbs, whereas Acanthamoeba dendrites don’t. Be sure to evaluate any dendritic keratitis carefully for the presence/absence of terminal bulbs!

In what key way might the presenting complaint of an Acanthamoeba keratitis patient differ from that of an HSV keratitis patient?

- The patient with Acanthamoeba keratitis will complain of pain that seems out of proportion to the clinical picture, while the HSV keratitis patient will have less pain than would be expected given the appearance of the cornea.

Why is Acanthamoeba keratitis so painful?

- Because the bug has a propensity for perineural invasion
Dendritiform keratopathy: DDx

- HSV
- Acanthamoeba
- Topical meds

In what key way do the dendrites of Acanthamoeba keratitis differ from those of HSV keratitis? HSV dendrites usually have **terminal bulbs**, whereas Acanthamoeba dendrites don’t. Be sure to evaluate any dendritic keratitis carefully for the presence/absence of **terminal bulbs**!

The Cornea

 HSV
 Acanthamoeba
 Topical meds

EBMD

Subepithelial deposits

Dendrites!
Dendritiform keratopathy: DDx

- HSV
- **Acanthamoeba**
- Topical meds

*In what key way do the dendrites of Acanthamoeba keratitis differ from those of HSV keratitis?* HSV dendrites usually have terminal bulbs, whereas Acanthamoeba dendrites don’t. Be sure to evaluate any dendritic keratitis carefully for the presence/absence of terminal bulbs!

- EBMD
- Subepithelial deposits
Dendritiform keratopathy: DDx

- HSV
- Acanthamoeba
- Topical meds

In what key way do the dendrites of Acanthamoeba keratitis differ from those of HSV keratitis? HSV dendrites usually have terminal bulbs, whereas Acanthamoeba dendrites don’t. Be sure to evaluate any dendritic keratitis carefully for the presence/absence of terminal bulbs!

In what key way might the presenting complaint of an Acanthamoeba keratitis patient differ from that of an HSV keratitis patient? The patient with Acanthamoeba keratitis will complain of pain that seems out of proportion to the clinical picture, while the HSV keratitis patient will have less pain than would be expected given the appearance of the cornea.

- EBMD
- Subepithelial deposits
In what key way do the dendrites of Acanthamoeba keratitis differ from those of HSV keratitis? HSV dendrites usually have terminal bulbs, whereas Acanthamoeba dendrites don’t. Be sure to evaluate any dendritic keratitis carefully for the presence/absence of terminal bulbs!

In what key way might the presenting complaint of an Acanthamoeba keratitis patient differ from that of an HSV keratitis patient? The patient with Acanthamoeba keratitis will complain of pain that seems out of proportion to the clinical picture, while the HSV keratitis patient will have less pain than would be expected given the appearance of the cornea.
Dendritiform keratopathy: DDx

- HSV
- **Acanthamoeba**
- Topical meds

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**The Cornea**

HSV

Acanthamoeba

Topical meds

---

In what key way do the dendrites of Acanthamoeba keratitis differ from those of HSV keratitis? HSV dendrites usually have terminal bulbs, whereas Acanthamoeba dendrites don’t. Be sure to evaluate any dendritic keratitis carefully for the presence/absence of terminal bulbs!

In what key way might the presenting complaint of an Acanthamoeba keratitis patient differ from that of an HSV keratitis patient? The patient with Acanthamoeba keratitis will complain of pain that seems out of proportion to the clinical picture, while the HSV keratitis patient will have less pain than would be expected given the appearance of the cornea.

Why is Acanthamoeba keratitis so painful?

- EBMD
- Subepithelial deposits
Dendritiform keratopathy: DDx

- HSV
- Acanthamoeba
- Topical meds

In what key way do the dendrites of Acanthamoeba keratitis differ from those of HSV keratitis? HSV dendrites usually have terminal bulbs, whereas Acanthamoeba dendrites don’t. Be sure to evaluate any dendritic keratitis carefully for the presence/absence of terminal bulbs!

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Why is Acanthamoeba keratitis so painful? Because the bug has a propensity for perineural invasion

- EBMD
- Subepithelial deposits
Dendritiform keratopathy: DDx

In this context, what does EBMD stand for?

- Adenovirus
- Thygeson’s
- EBMD
- Sub-epi deposits

EBMD

Dendrites!
Dendritiform keratopathy: DDx

- Adenovirus
- Thygeson’s
- EBMD
- Subepithelial deposits

In this context, what does EBMD stand for?
Epithelial basement membrane dystrophy

- Map-dot-fingerprint dystrophy
- Cogan’s microcystic dystrophy
- Anterior basement membrane dystrophy

What is the slit-lamp appearance of EBMD?
- Fingerprint lines: Thin, curvy lines that occur in groups and follow the same course
- Map lines: Thicker lines that follow a more jagged course
- Dots/cysts

What do pts complain of?
Most cases present with symptoms related to recurrent epithelial erosions (REE)

It’s Dendritiform Keratopathy, Haters
Dendritiform keratopathy: DDx

In this context, what does EBMD stand for?
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What are three other common names for EBMD?

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Adenovirus
Thygeson’s
EBMD
Subepithelial deposits

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Dendritiform keratopathy: DDx

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Adenovirus
Thygeson’s
EBMD
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Dendritiform keratopathy: DDx

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--Dots/cysts

What do pts complain of?
Most cases present with symptoms related to recurrent epithelial erosions (REE)

What are the ‘6 F’s’ of EBMD?
--F
--F
--F
--F
--F
--F
Dendritiform keratopathy: DDx

*In this context, what does EBMD stand for?*
Epithelial basement membrane dystrophy

*What are three other common names for EBMD?*
--Map-dot-fingerprint dystrophy
--Cogan’s microcystic dystrophy
--Anterior basement membrane dystrophy

*What is the slit-lamp appearance of EBMD?*
It can present in any combo of the following:
--**Fingerprint lines:** Thin, curvy lines that occur in groups and follow the same course
--**Map lines:** Thicker lines that follow a more jagged course
--**Dots/cysts**

*What do pts complain of?*
Most cases present with symptoms related to **recurrent epithelial erosions** (REE)

---

**Adenovirus**

**Thygeson’s EBMD**

**EBMD**

**Subepithelial deposits**

*What are the ‘6 F’s’ of EBMD?*
--Female
--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

It’s Dendritiform Keratopathy, Haters
Dendritiform keratopathy: DDx

- HSV
- Acanthamoeba
- Topical meds
- EBV
- Soft CL wear
- HZO
- Adenovirus
- Thygeson’s

What does this mean, sub-epi deposits?

Subepithelial deposits
Dendritiform Keratopathy: DDx

- HSV
- Acanthamoeba
- Topical meds
- EBV
- Soft CL wear
- HZO
- Adenovirus
- Thygeson’s

What does this mean, sub-epi deposits?
Deposits as found in diseases such as Fabry’s, as well as with certain systemic drugs

Subepithelial deposits
Dendritiform keratopathy: DDx

- HSV?
- Acanthamoeba?
- Topical meds?
- EBV?
- Soft CL wear?
- HZO?
- Adenovirus?
- Thygeson’s?
- EBMD?
- Subepithelial deposits?

The strength-of-association with dendritiform lesions is not the same for all of these conditions. For which three conditions is the association especially weak?

It’s Dendritiform Keratopathy, Haters
**Dendritiform Keratopathy:** DDx
- HSV
- Acanthamoeba
- Topical meds
- EBV
- Soft CL wear
- HZO
- Adenovirus
- Thygeson’s
- EBMD
- Subepithelial deposits

The strength-of-association with dendritiform lesions is not the same for all of these conditions. For which three conditions is the association especially **weak**?

*It’s Dendritiform Keratopathy, Haters*
What are the three adenoviral ocular syndromes?

- Soft CL wear
- HZO
- Adenovirus
Dendritiform keratopathy: DDx
- HSV
- Acanthamoeba
- Topical meds
- EBV
- Soft CL wear
- HZO
- Adenovirus
- Thygeson’s
- EBMD
- Subepithelial deposits

What are the three adenoviral ocular syndromes?
- Follicular conjunctivitis
- Pharyngoconjunctival Fever (PCF)
- Epidemic Keratoconjunctivitis (EKC)

It’s Dendritiform Keratopathy, Haters
Of the three, which is the only one with significant corneal involvement?

- Soft CL wear
- HZO
- Adenovirus
- Thygeson’s
- EBMD
- Subepithelial deposits

It's Dendritiform Keratopathy, Haters
Of the three, which is the only one with significant corneal involvement?

- Soft CL wear
- HZO
- Adenovirus
- Thygeson’s
- EBMD
- Subepithelial deposits
Dendritiform keratopathy: DDx
- HSV
- Acanthamoeba
- Topical meds
- EBV
- Soft CL wear
- HZO
- Adenovirus
- Thygeson’s
- EBMD
- Subepithelial deposits

"There’s a good chance that, in your time as an ophthalmologist, you haven’t seen adenoviral follicular conjunctivitis. Why is that?"
### Follicular conjunctivitis

Mild disease, rarely seen in clinic

---

**Pharyngoconjunctival Fever (PCF)**

**Epidemic Keratoconjunctivitis (EKC)**

---

*There’s a good chance that, in your time as an ophthalmologist, you haven’t seen adenoviral follicular conjunctivitis. Why is that? Because it is so mild, and so transient, that sufferers do not bother to come in for treatment.*

---

- **HZO**
- **Adenovirus**
- **Thygeson’s**
- **EBMD**
- **Subepithelial deposits**

---

_Dendrites!_
It’s Dendritiform Keratopathy, Haters

Follicular conjunctivitis

Pharyngoconjunctival Fever (PCF)

Epidemic Keratoconjunctivitis (EKC)

Mild disease, rarely seen in clinic

How does pharyngoconjunctival fever present?

- Soft Contact Lens wear
- HZO
- Adenovirus
- Thygeson’s
- EBMD
- Subepithelial deposits

Dendrites!
**Follicular conjunctivitis**
Mild disease, rarely seen in clinic

**Pharyngoconjunctival Fever (PCF)**
Follicular conjunctivitis + HA + fever + pharyngitis

How does pharyngoconjunctival fever present?
With a follicular conjunctivitis accompanied by HA, fever (check the name), and pharyngitis (ditto)

**Epidemic Keratoconjunctivitis (EKC)**

- Soft Contact Lens wear
- HZO
- Adenovirus
- Thygeson’s EBMD
- EBMD
- Thygeson’s Sub-epi deposits
- Subepithelial deposits

**It’s Dendritiform Keratopathy, Haters**
Follicular conjunctivitis

Pharyngoconjunctival Fever (PCF)

Epidemic Keratoconjunctivitis (EKC)

Mild disease, rarely seen in clinic

Follicular conjunctivitis + HA + fever + pharyngitis

How does pharyngoconjunctival fever present?
With a follicular conjunctivitis accompanied by HA, fever (check the name), and pharyngitis (ditto)

Because of its manifestations, with what common systemic condition is it sometimes confused?

The flu

Mild disease, rarely seen in clinic

Soft CL wear

HZO

Adenovirus

Thygeson’s EBMD

EBMD

Sub-epi deposits

Dendrites!

It’s Dendritiform Keratopathy, Haters
It's Dendritiform Keratopathy, Haters

- Follicular conjunctivitis
  - Mild disease, rarely seen in clinic

- Pharyngoconjunctival Fever (PCF)
  - Looks like the flu
  - Follicular conjunctivitis + HA + fever + pharyngitis

- Epidemic Keratoconjunctivitis (EKC)

How does pharyngoconjunctival fever present?
With a follicular conjunctivitis accompanied by HA, fever (check the name), and pharyngitis (ditto)

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The flu

- Soft Contact Lens Wear
- HZO
- Adenovirus
- Thygeson’s
- EBMD
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- Dendrites!
Follicular conjunctivitis
Mild disease, rarely seen in clinic

Pharyngoconjunctival Fever (PCF)
Looks like the flu

Epidemic Keratoconjunctivitis (EKC)

- Soft CL wear
- HZO
- Adenovirus
- Thygeson’s
- EBMD
- Subepithelial deposits

How does epidemic keratoconjunctivitis present?
In stages...
Stage 1:
Stage 2:
Stage 3:

Adenovirus
Thygeson’s
EBMD
Sub-epi deposits
Dendrites!
It’s Dendritiform Keratopathy, Haters

**Follicular conjunctivitis**
Mild disease, rarely seen in clinic

**Pharyngoconjunctival Fever (PCF)**
Looks like the flu

**Epidemic Keratoconjunctivitis (EKC)**

- Soft CL wear
- HZO
- Adenovirus
- Thygeson’s
- EBMD
- Subepithelial deposits

---

**How does epidemic keratoconjunctivitis present?**
In stages...

**Stage 1:** Upper respiratory tract infection
**Stage 2:**
**Stage 3:**

- Adenovirus
- Thygeson’s
- EBMD
- Sub-epi deposits
- Dendrites!
Follicular conjunctivitis

Mild disease, rarely seen in clinic

Pharyngoconjunctival Fever (PCF)

Looks like the flu

Epidemic Keratoconjunctivitis (EKC)

How does epidemic keratoconjunctivitis present?
In stages...
Stage 1: Upper respiratory tract infection
Stage 2: Severe follicular conjunctivitis
Stage 3:

- Adenovirus
- Thygeson’s
- EBMD
- Sub-epi deposits
- Dendrites!

- Soft CL wear
- HZO
- Adenovirus
- Thygeson’s
- EBMD
- Subepithelial deposits

It’s Dendritiform Keratopathy, Haters
**Follicular conjunctivitis**
Mild disease, rarely seen in clinic

**Pharyngoconjunctival Fever (PCF)**
Looks like the flu

**Epidemic Keratoconjunctivitis (EKC)**

How does epidemic keratoconjunctivitis present?
In stages...
- **Stage 1**: Upper respiratory tract infection
- **Stage 2**: Severe follicular conjunctivitis
- **Stage 3**: Subepithelial infiltrates

**Adenovirus**
- Thygeson’s
- EBMD
- Sub-epi deposits

**Dendrites!**

- Soft CL wear
- HZO
- **Adenovirus**
- Thygeson’s
- EBMD
- Subepithelial deposits

*It’s Dendritiform Keratopathy, Haters*
It’s Dendritiform Keratopathy, Haters

**Follicular conjunctivitis**
Mild disease, rarely seen in clinic

**Pharyngoconjunctival Fever (PCF)**
Looks like the flu

**Epidemic Keratoconjunctivitis (EKC)**
Bilateral follicular conjunctivitis

What will pts complain of at this stage?

- Adenovirus
- Thygeson’s
- EBMD
- Subepithelial deposits

How does epidemic keratoconjunctivitis present?
In stages…
- **Stage 1**: Upper respiratory tract infection
- **Stage 2**: Severe follicular conjunctivitis
- **Stage 3**: Subepithelial infiltrates

What nonocular sign might be found?
Preauricular lymphadenopathy

Bilateral follicular conjunctivitis +
Punctate keratopathy +
Petechial hemorrhages +
Conjunctival membranes +
Lymphadenopathy
Follicular conjunctivitis
Mild disease, rarely seen in clinic

Pharyngoconjunctival Fever (PCF)
Looks like the flu

Epidemic Keratoconjunctivitis (EKC)
Bilateral follicular conj’itis

What will pts complain of at this stage?
Tearing, foreign-body sensation, photophobia

How does epidemic keratoconjunctivitis present?
In stages...
Stage 1: Upper respiratory tract infection
Stage 2: Severe follicular conjunctivitis
Stage 3: Subepithelial infiltrates

Adenovirus
Thygeson’s
EBMD
Sub-epi deposits
Dendrites!

It’s Dendritiform Keratopathy, Haters
**Follicular conjunctivitis**

Mild disease, rarely seen in clinic

---

**Pharyngoconjunctival Fever (PCF)**

Looks like the flu

---

**Epidemic Keratoconjunctivitis (EKC)**

Bilateral follicular conj’itis +

---

**Adenovirus**

- Thygeson’s
- EBMD
- Sub-epithelial deposits

---

How does epidemic keratoconjunctivitis present?
In stages...

*Stage 1: Upper respiratory tract infection*

*Stage 2: Severe follicular conjunctivitis*

*Stage 3: Subepithelial infiltrates*

---

- Dendrites!
**Follicular conjunctivitis**
Mild disease, rarely seen in clinic

**Pharyngoconjunctival Fever (PCF)**
Looks like the flu

**Epidemic Keratoconjunctivitis (EKC)**
Bilateral follicular conj’itis + punctate keratopathy +

---

**Adenovirus**
- Thygeson’s
- EBMD
- Subepithelial deposits

---

**Stage 1:** Upper respiratory tract infection
**Stage 2:** Severe follicular conjunctivitis
**Stage 3:** Subepithelial infiltrates

---

**How does epidemic keratoconjunctivitis present?**
In stages...

---

**What will pts complain of at this stage?**
Tearing, foreign-body sensation, photophobia

---

**Slit-lamp exam of the anterior segment will reveal…**
...Punctate epithelial keratopathy
...
...

---

**It’s Dendritiform Keratopathy, Haters**
It's Dendritiform Keratopathy, Haters

Follicular conjunctivitis
- Mild disease, rarely seen in clinic

Pharyngoconjunctival Fever (PCF)
- Looks like the flu

Epidemic Keratoconjunctivitis (EKC)
- Bilateral follicular conjunctivitis + punctate keratopathy + petechial hemorrhages +

What will pts complain of at this stage?
- Tearing, foreign-body sensation, photophobia

Slit-lamp exam of the anterior segment will reveal...
- Punctate epithelial keratopathy
- Sub-conj heme
...

How does epidemic keratoconjunctivitis present?
- In stages...
  - Stage 1: Upper respiratory tract infection
  - Stage 2: Severe follicular conjunctivitis
  - Stage 3: Subepithelial infiltrates

Adenovirus
- Thygeson’s
- EBMD
- Sub-epi deposits

Dendrites!
**Follicular conjunctivitis**

Mild disease, rarely seen in clinic

---

**Pharyngoconjunctival Fever (PCF)**

Looks like the flu

---

**Epidemic Keratoconjunctivitis (EKC)**

Bilateral follicular conj’itis + punctate keratopathy + petechial hemorrhages + conj membranes

---

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**Dendrites!**

---

**How does epidemic keratoconjunctivitis present?**

In stages...

1. **Stage 1**: Upper respiratory tract infection
2. **Stage 2**: Severe follicular conjunctivitis
3. **Stage 3**: Subepithelial infiltrates

---

**What will pts complain of at this stage?**

Tearing, foreign-body sensation, photophobia

---

**Slit-lamp exam of the anterior segment will reveal…**

- Punctate epithelial keratopathy
- Sub-conj heme
- Conjunctival membranes
Dendritiform keratopathy: DDx

- HSV
- Acanthamoeba
- Topical meds
- EBV
- Soft CL wear
- HZO
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What nonocular sign might be found?

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The strength-of-association with dendritiform lesions is not the same for all of these conditions. For which three conditions is the association especially weak?

- HSV
- Acanthamoeba
- Topical meds

What is the complete name of the condition listed here as simply ‘Thygeson’s’?

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- Thygeson’s
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It’s Dendritiform Keratopathy, Haters
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  - HSV
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Thygeson’s superficial punctate keratitis

What are Thygeson’s pts c/o?
Photophobia and foreign-body sensation

What is the classic corneal finding on exam? (hint: it’s not dendritiform lesions)
Multiple discrete punctate lesions

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