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The Plastics book identifies six general causes of entropion and/or ectropion. What are they? (Note that while most apply to both entropion and ectropion, a few apply only to one or the other.)
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**Entropion Categories**
- Congenital
- Involutional
- Paralytic
- Cicatricial
- Mechanical
- Acute Spastic

**Ectropion**
Of the six, which can result in entropion?

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*Of the six, which can result in ectropion?*
Let’s drill down on cicatricial changes.
In a nutshell, what is the pathogenesis of…
--Cicatricial ectropion?
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--Cicatricial ectropion? Scarring of the lid’s anterior lamella causes it (the anterior lamella) to shorten, which in turn causes the lid margin to turn outward
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Note this subtle-but-critical difference!
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Note this subtle-but-crucial difference!

This one too!
In a nutshell, what is the pathogenesis of...

--Cicatrical ectropion? Scarring of the lid’s anterior lamella causes it (the anterior lamella) to shorten, which in turn causes the lid margin to turn outward.

--Cicatrical entropion? Scarring of the lid’s posterior lamella causes it (the posterior lamella) to shorten, which in turn causes the lid margin to turn inward.

‘Anterior lamella’? ‘Posterior lamella’? How many layers does an eyelid have?
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‘Anterior lamella’? ‘Posterior lamella’? How many layers does an eyelid have?
Well, the lids have a number of layers (the precise count depends on whether it’s an upper vs lower lid, as well as the distance from the margin at which one does the counting).
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What structures comprise each lamella?
Anterior: ?
Posterior:
In a nutshell, what is the pathogenesis of…

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**What structures comprise each lamella?**

*Anterior*: Skin and **orbicularis muscle**

*Posterior:*
In a nutshell, what is the pathogenesis of...

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What structures comprise each lamella?

Anterior: Skin and orbicularis muscle

Posterior: ?
What structures comprise each lamella?

Anterior: Skin and orbicularis muscle

Posterior: Tarsal plate and conjunctiva
Cicatricial Entropion

Eyelid lamellae
What about beyond the tarsal plates, ie, above it in the upper lid, and below it in the lower? How many lamella are conceptualized in these locations?

Anterior lamella
- Skin
- Orbicularis muscle

Posterior lamella
- Tarsal plate
- Conjunctiva

Cicatricial Ectropion

Scarring of the lid's anterior lamella causes it (the anterior lid margin) to turn outward.

Scarring of the lid's posterior lamella causes it (the posterior lid margin) to turn inward.

What about beyond the tarsal plates, ie, above it in the upper lid, and below it in the lower? How many lamella are conceptualized in these locations?

Three: Anterior, middle, and posterior.

Anterior lamella
- Does not change.

Middle lamella
- New
- Composed of eyelid retractors and orbital septum (in the lower lid, the eyelid fat pads).

Posterior lamella
- Beyond the location of the tarsal plate, the plate itself isn’t part of the posterior lamella (duh), so in these areas the posterior lamella consists only of the conjunctiva.
What about beyond the tarsal plates, ie, above it in the upper lid, and below it in the lower? How many lamella are conceptualized in these locations?

Three: Anterior, middle and posterior

---

**anterior lamella**

Skin and orbicularis muscle

**posterior lamella**

Tarsal plate and conjunctiva

---

What about beyond the tarsal plates, ie, above it in the upper lid, and below it in the lower? How many layers does an eyelid have?

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**Anterior**: Skin and orbicularis muscle

**Posterior**: Tarsal plate and conjunctiva

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Middle lamella

---

Cicatricial Entropion

---

Cicatricial Ectropion

---

Cicatricial Ectropion
What about beyond the tarsal plates, ie, above it in the upper lid, and below it in the lower? How many lamella are conceptualized in these locations? Three: Anterior, middle and posterior

What structures comprise each of these three lamellae beyond the tarsal plates? --The anterior lamella...?

anterior lamella

Start here

Cicatricial E\text{ntropion}

--Middle lamella

posterior lamella

--Beyond the location of the tarsal plate, the plate itself isn't part of the posterior lamella (duh), so in these areas the posterior lamella consists only of the conjunctiva.

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What structures comprise each of these three lamellae beyond the tarsal plates?

--The anterior lamella...doesn’t change; it’s still skin and orbicularis.

--

The newly-arisen middle lamella is composed of the eyelid retractors and orbital septum, as well (in the lower lid) of the eyelid fat pads.

Beyond the location of the tarsal plate, the plate itself isn’t part of the posterior lamella (duh), so in these areas the posterior lamella consists only of the conjunctiva.

What is the pathogenesis of…

--Cicatricial ectropion?

Scarring of the lid’s anterior lamella causes it (the anterior lid margin) to turn outward.

--Cicatricial entropion?

Scarring of the lid’s posterior lamella causes it (the posterior lid margin) to turn inward beyond the tarsal plates.

Middle lamella

What about beyond the tarsal plates, ie, above it in the upper lid, and below it in the lower? How many lamella are conceptualized in these locations? Three: Anterior, middle and posterior.

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Anterior: Skin and orbicularis muscle.

Posterior: Tarsal plate and conjunctiva.
What about beyond the tarsal plates, ie, above it in the upper lid, and below it in the lower? How many lamella are conceptualized in these locations?

Three: Anterior, middle and posterior

What structures comprise each of these three lamellae beyond the tarsal plates?

--The **anterior lamella**...doesn’t change; it’s still skin and orbicularis

--

--Beyond the location of the tarsal plate, the plate itself isn’t part of the posterior lamella (duh), so in these areas the **posterior lamella**…?

---

What does an eyelid have?

Cicatricial Ectropion

Scarring of the lid's anterior lamella causes it (the anterior lid margin) to turn outward

Scarring of the lid's posterior lamella causes it (the posterior lid margin) to turn inward beyond the tarsal plates

---

What structures comprise each lamella?

**Anterior:** Skin and orbicularis muscle!

**Posterior:** Tarsal plate and conjunctiva?
What about beyond the tarsal plates, ie, above it in the upper lid, and below it in the lower? How many lamella are conceptualized in these locations? Three: Anterior, middle and posterior

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An anterior lamella causes it (the anterior lid margin) to turn outward
A posterior lamella causes it (the posterior lid margin) to turn inward

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---The anterior lamella...doesn't change; it's still skin and orbicularis

---As for the newly-arisen middle lamella...?

---Beyond the location of the tarsal plate, the plate itself isn't part of the posterior lamella (duh), so in these areas the posterior lamella... consists only of the conj...

Cicatricial Ectropion

---Anterior lamella

---Posterior lamella

Finally!

Middle lamella: ?

What structures comprise each lamella?

**Anterior:** Skin and orbicularis muscle!

**Posterior:** Tarsal plate and conjunctiva!
What about beyond the tarsal plates, ie, above it in the upper lid, and below it in the lower? How many lamella are conceptualized in these locations?
Three: Anterior, middle and posterior

What structures comprise each of these three lamellae beyond the tarsal plates?
--The **anterior lamella**...doesn’t change; it’s still skin and orbicularis
--As for the newly-arisen **middle lamella**...it is composed of the two words and two diff words
--Beyond the location of the tarsal plate, the plate itself isn’t part of the posterior lamella (duh), so in these areas the **posterior lamella**... consists only of the conj

What happens does an eyelid have?

What structures comprise each lamella?
**Anterior**: Skin and orbicularis muscle!
**Posterior**: Tarsal plate and conjunctiva!

---

Cicatricial Entropion

Scarring of the lid's anterior lamella causes it (the anterior lid margin) to turn outward
Scarring of the lid's posterior lamella causes it (the posterior lid margin) to turn inward beyond the tarsal plates

---

Middle lamella: ?
What about beyond the tarsal plates, ie, above it in the upper lid, and below it in the lower? How many lamella are conceptualized in these locations? Three: Anterior, middle and posterior

What structures comprise each of these three lamellae beyond the tarsal plates?
--The **anterior lamella**...doesn’t change; it’s still skin and orbicularis
--As for the newly-arisen **middle lamella**...it is composed of the eyelid retractors and orbital septum

--Beyond the location of the tarsal plate, the plate itself isn’t part of the posterior lamella (duh), so in these areas the **posterior lamella**...consists only of the conj

---

**Middle lamella**: Eyelid retractors, orbital septum

**Anterior lamella**

**Posterior lamella**

What is the pathogenesis of...Cicatricial Ectropion?
Scarring of the lid’s anterior lamella causes it (the anterior lid margin) to turn outward
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What structures comprise each lamella?
**Anterior**: Skin and orbicularis muscle!
**Posterior**: Tarsal plate and conjunctiva!
What about beyond the tarsal plates, ie, above it in the upper lid, and below it in the lower? How many lamella are conceptualized in these locations? Three: Anterior, middle and posterior.

What structures comprise each of these three lamellae beyond the tarsal plates?

- The **anterior lamella**...doesn’t change; it’s still skin and orbicularis.
- As for the newly-arisen **middle lamella**...it is composed of the eyelid retractors and orbital septum, as well as (in the lower lid) the eyelid fat pads.
- Beyond the location of the tarsal plate, the plate itself isn’t part of the posterior lamella (duh), so in these areas the **posterior lamella**...consists only of the conjunctiva.

What structures comprise each lamella?

**Anterior**: Skin and orbicularis muscle!  
**Posterior**: Tarsal plate and conjunctiva!  

*Middle lamella*: Eyelid retractors, orbital septum.
**Cicatricial Entropion**

What about beyond the tarsal plates, ie, above it in the upper lid, and below it in the lower? How many lamella are conceptualized in these locations? Three: Anterior, middle and posterior

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--- Beyond the location of the tarsal plate, the plate itself isn’t part of the posterior lamella (duh), so in these areas the **posterior lamella**...consists only of the conjunctiva

--- Cicatricial ectropion

Scarring of the lid’s anterior lamella causes it (the anterior lid margin) to turn outward

--- Cicatricial entropion

Scarring of the lid’s posterior lamella causes it (the posterior lid margin to turn inward

--- What about beyond the tarsal plates, ie, above it in the upper lid, and below it in the lower? How many lamella are conceptualized in these locations? Three: Anterior, middle and posterior

--- What structures comprise each lamella?

**Anterior:** Skin and orbicularis muscle!

**Posterior:** Tarsal plate and conjunctiva!

--- Middle lamella: Eyelid retractors, orbital septum, eyelid fat pads (lower lid)
Cicatricial Entropion

Eyelid lamellae below the tarsal plate in the lower lid
Let's look at cicatricial ectropion in more detail.
Common causes of cicatricial ectropion:

- Trauma
- Burn
- Iatrogenic
- Actinic skin changes
- Inflammatory disease
- Rosacea
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- Trauma
- Burn
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- Inflammatory disease
- Rosacea
Cicatricial Ectropion

Cicatricial ectropion
Managing cicatricial ectropion of the lower lid involves three steps:

1) **Release/relax**… *(finish the thought)*

2) 

3)
Managing cicatricial ectropion of the lower lid involves three steps:

1) **Release/relax** ...the traction caused by the cicatrix
2)
3)
Managing cicatricial ectropion of the lower lid involves three steps:

1) **Release/relax**… the traction caused by the cicatrix
2) **Lengthen**… *(ditto)*
3)
Managing cicatricial ectropion of the lower lid involves three steps:

1) Release/relax...the traction caused by the cicatrix
2) Lengthen...the lid *vertically* (with a FTSG) *(full-thickness skin graft)*
3)
Managing cicatricial ectropion of the lower lid involves three steps:

1) **Release/relax** ...the traction caused by the cicatrix
2) **Lengthen** ...the lid *vertically* (with a FTSG)
3) **Shorten** *(ditto)*
Managing cicatricial ectropion of the lower lid involves three steps:

1) Release/relax…the traction caused by the cicatrix
2) Lengthen…the lid vertically (with a FTSG)
3) Shorten…the lid horizontally (with a lateral tarsal strip)
Cicatricial Ectropion

Cicatricial ectropion: Pre- and post-repair
Managing cicatricial ectropion of the lower lid involves three steps:

1) Release/relax… the traction caused by the cicatrix
2) Lengthen… the lid vertically (with a FTSG)
3) Shorten… the lid horizontally (with a lateral tarsal strip)

Which of these steps are involved in repair of UPPER lid cicatricial ectropion?
Managing cicatricial ectropion of the lower lid involves three steps:

1) Release/relax...the traction caused by the cicatrix
2) Lengthen...the lid vertically (with a FTSG)
3) Shorten...the lid horizontally (with a lateral tarsal strip)

Which of these steps are involved in repair of UPPER lid cicatricial ectropion?
1 and 2, but not 3: The upper lid generally does not suffer horizontal laxity, so tightening is not required
Now let's look at cicatricial *entropion*
In another nutshell, what is the pathogenesis of cicatricial entropion?
In another nutshell, what is the pathogenesis of cicatricial entropion?

- Vertical tarsoconjunctival contracture

Q/A

Cicatricial Entropion

of the
In another nutshell, what is the pathogenesis of cicatricial entropion?

Vertical tarsconjunctival contracture →

of the

next
In another nutshell, what is the pathogenesis of cicatricial entropion?

Vertical tarsoconjunctival contracture \(\rightarrow\) in-rotation of the

Q/A

Cicatricial Entropion

finally
In another nutshell, what is the pathogenesis of cicatricial entropion?

*Vertical tarsal conjunctival contracture* → *in-rotation of the lid margin*
In another nutshell, what is the pathogenesis of cicatricial entropion? How does this lead to cornea problems?

- Vertical tars Conjunctival contracture →
- In-rotation of the lid margin →
- Two-words of the one word

Cornea problems

Answer these simultaneously
In another nutshell, what is the pathogenesis of cicatricial entropion? How does this lead to cornea problems?

**Vertical tarsal conjunctival contracture** → **in-rotation of the lid margin** → **in-rotation of the eyelashes** → cornea problems

**Cicatricial Entropion**
In another nutshell, what is the pathogenesis of cicatricial entropion? How does this lead to cornea problems?

Vertical tarsconjunctival contracture → in-rotation of the lid margin → in-rotation of the eyelashes → cornea problems

‘In-rotation of the eyelashes’? Why not just say ‘trichiasis’?
In another nutshell, what is the pathogenesis of cicatricial entropion? How does this lead to cornea problems?

Vertical tarsconjunctival contracture → in-rotation of the lid margin → in-rotation of the eyelashes → cornea problems

‘In-rotation of the eyelashes’? Why not just say ‘trichiasis’? Because trichiasis is not present
In another nutshell, what is the pathogenesis of cicatricial entropion? How does this lead to cornea problems?

Vertical tarsocconjunctival contracture $\rightarrow$ in-rotation of the lid margin $\rightarrow$ in-rotation of the eyelashes $\rightarrow$ cornea problems

‘In-rotation of the eyelashes’? Why not just say ‘trichiasis’?
Because trichiasis is not present

Huh? But the lashes are touching the cornea--isn’t that the definition of trichiasis?
In another nutshell, what is the pathogenesis of cicatricial entropion? How does this lead to cornea problems?

Vertical tarsconjunctival contracture → inrotation of the lid margin → inrotation of the eyelashes → cornea problems

‘In-rotation of the eyelashes’? Why not just say ‘trichiasis’? Because trichiasis is not present

Huh? But the lashes are touching the cornea—isn’t that the definition of trichiasis? No, it isn’t. Trichiasis is defined as the inward-directing of lashes that originate from a normally-positioned lid margin.
In another nutshell, what is the pathogenesis of cicatricial entropion? How does this lead to cornea problems?

Vertical tarsal conjunctival contracture → in-rotation of the lid margin → in-rotation of the eyelashes → cornea problems

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Because trichiasis is not present

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No, it isn’t. Trichiasis is defined as the inward-directing of lashes that originate from a normally-positioned lid margin. In any form of entropion (ie, not just cicatricial), the position of the lid margin is rotated inward, and therefore not normal. Thus, the term *trichiasis*, while often employed, is technically incorrect.
In another nutshell, what is the pathogenesis of cicatricial entropion? How does this lead to cornea problems?

Vertical tarsot Conjunctival contracture $\rightarrow$ in-rotation of the lid margin $\rightarrow$ in-rotation of the eyelashes $\rightarrow$ cornea problems

‘In-rotation of the eyelashes’? Why not just say ‘trichiasis’?
Because trichiasis is not present

Technically incorrect, sure. But in fairness, many clinicians aren’t this persnickety about the term trichiasis--and neither are the BCSC books. So this is not the hill you want to die on when taking the Boards.

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Q

How does distichiasis differ from trichiasis?

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How does distichiasis differ from trichiasis?
In trichiasis, the lashes are growing from their usual location (albeit in an abnormal direction), whereas in distichiasis, lashes are growing from meibomian gland orifices.

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Distichiasis: Lashes arising from MG orifices
In another nutshell, what is the pathogenesis of cicatricial entropion? How does this lead to cornea problems?

Vertical tarsal and conjunctival contracture → in-rotation of the lid margin → in-rotation of the eyelashes → corneal problems

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Is distichiasis congenital, or acquired?

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It can be either.

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How on earth can an oil gland give rise to an eyelash?

Because embryology. In the first trimester, the meibomian glands and eyelashes differentiate from a common pilosebaceous ‘ancestor.’ Given this, it’s easy to see how a failure of differentiation could lead to the presence of eyelashes in meibomian gland orifices, resulting in congenital distichiasis. And it doesn’t take much to prod the progenitor cells in a mature meibomian gland to differentiate into an eyelash follicle and sprout one, resulting in acquired distichiasis.
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Cicatricial Entropion

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**Cicatricial Entropion**

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What sort of event/situation can ‘prod’ a meibomian gland to produce acquired distichiasis?

Trauma; chronic inflammation

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Cicatricial Entropion

Trauma; chronic inflammation

‘In-rotation of the eyelashes’, with the lashes touching the cornea.
In another nutshell, what is the pathogenesis of cicatricial entropion? How does this lead to cornea problems?

Vertical tarsal conjunctival contracture $\rightarrow$ in-rotation of the lid margin $\rightarrow$ in-rotation of the eyelashes $\rightarrow$ cornea problems

When evaluating cicatricial entropion, for what crucial question must an adequate answer be determined?

- What is the underlying etiology of the cicatrix—that is, what caused the scarring in the first place?

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What is the DDx for cicatricial entropion?
In another nutshell, what is the pathogenesis of \textit{cicatricial entropion}? How does this lead to cornea problems?

Vertical tarsal conjunctival contracture \rightarrow \textit{in-rotation of the lid margin} \rightarrow \textit{in-rotation of the eyelashes} \rightarrow \text{cornea problems}

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That question is: What is the underlying etiology of the cicatrix—that is, \textbf{what caused the scarring in the first place}?

\textit{What is the DDx for cicatricial entropion?} Glad you asked…
Common causes of cicatricial entropion:
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- Ocular cicatricial pemphigoid (OCP)
- Stevens-Johnson syndrome (SJS)
- Trachoma
- Trauma
- Sarcoid
- Iatrogenic
Cicatricial entropion
Cicatricial entropion in OCP
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If the cause is inflammatory, make sure that process is completely quiescent before attempting repair!
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What is the causative organism in trachoma?

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What is the causative organism in trachoma?
* C trachomatis serotypes

Where does trachoma rank as a cause of blindness worldwide?
It is the most common cause of infectious blindness

Where in the world is trachoma prevalent?
The Middle East, South Asia, Africa

Is trachoma primarily a follicular, or papillary conjunctivitis?
Follicular

Where do the follicles tend to occur?
On the superior palpebral conj, and the superior limbal region

Cicatricial Entropion
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Where does trachoma rank as a cause of blindness worldwide?
- It is the most common cause of infectious blindness
- Prevalent in the Middle East, South Asia, Africa
- Primarily a follicular, or papillary conjunctivitis
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Where does trachoma rank as a cause of blindness worldwide?
It is the most common cause of infectious blindness.

Why are they blind, i.e., what ocular structure is responsible?
The cornea—it is scarred, and covered by a pannus.

Repeated infections produce scarification of the superior palpebral conjunctiva, and the subsequent cicatricial entropion leads to severe trichiasis which decimates the corneal surface.
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**In a nutshell, what sequence of events leads to corneal opacification?**

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**Where in the world is trachoma prevalent?**
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What is the causative organism in trachoma? 
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Where does trachoma rank as a cause of blindness worldwide? 
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United States
Where in the world is trachoma prevalent? 
The Middle East, South Asia, Africa

In the US, which ethnic group is most likely to be affected?
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What is the causative organism in trachoma?

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Where does trachoma rank as a cause of blindness worldwide?

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Trachoma is primarily a follicular, or papillary conjunctivitis.

Where do the follicles tend to occur?

On the superior palpebral conjunctiva and the superior limbal region

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Where does trachoma rank as a cause of blindness worldwide?
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When limbal follicles scar, what classic eponymous exam finding results?
Herbert's pits

When upper-lid tarsal follicles scar, what classic eponymous exam finding results?
Arlt's line

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Cicatricial Entropion

Trachoma: Herbert’s pits
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superior palpebral conj

Q
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Cicatricial Entropion

Trachoma: Arlt’s line
How would you correct cicatricial entropion in cases of:

- **Mild disease:**
- **Moderate disease:**
- **Severe disease:**
How would you correct cicatricial entropion in cases of:

- **Mild disease**: Anterior lamellar resection
- **Moderate disease**: 
- **Severe disease**: 

Cicatricial Entropion
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- **Moderate disease**: Tarsal fracture procedure
- **Severe disease**:
How would you correct cicatricial entropion in cases of:

- **Mild disease**: Anterior lamellar resection
- **Moderate disease**: Tarsal fracture procedure
- **Severe disease**: Excise/replace scarred tissues
How would you correct cicatricial entropion in cases of:

- **Mild disease:** Anterior lamellar resection
- **Moderate disease:** Tarsal fracture procedure
- **Severe disease:** **Excise/replace scarred tissues**