

# ***Congenital Nasolacrimal Duct Obstruction and Dacryoceles***



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*Let's start with congenital nasolacrimal obstruction (NLDO)...*



## ***Congenital Nasolacrimal Duct Obstruction*** and *Dacryoceles*



- In congenital nasolacrimal duct obstruction, where is the site of obstruction?

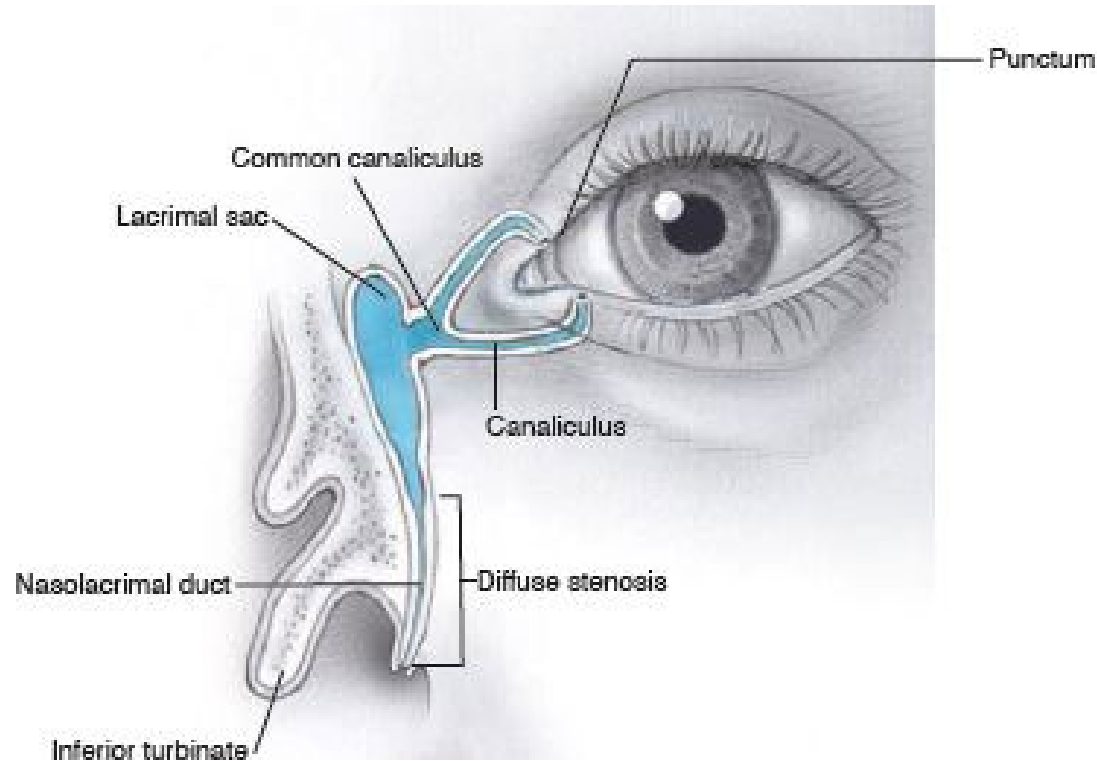
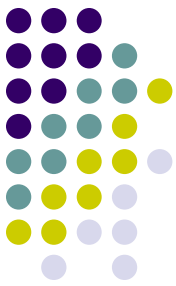
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## ***Congenital Nasolacrimal Duct Obstruction** and Dacryoceles*



- In congenital nasolacrimal duct obstruction, where is the site of obstruction typically located? **At the distal end of the NLD**

## ***Congenital Nasolacrimal Duct Obstruction and Dacryoceles***



Congenital nasolacrimal duct obstruction: Stenosis at the distal end of the system



# Q

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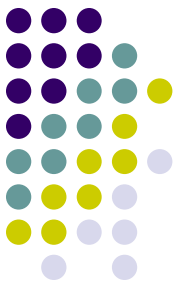
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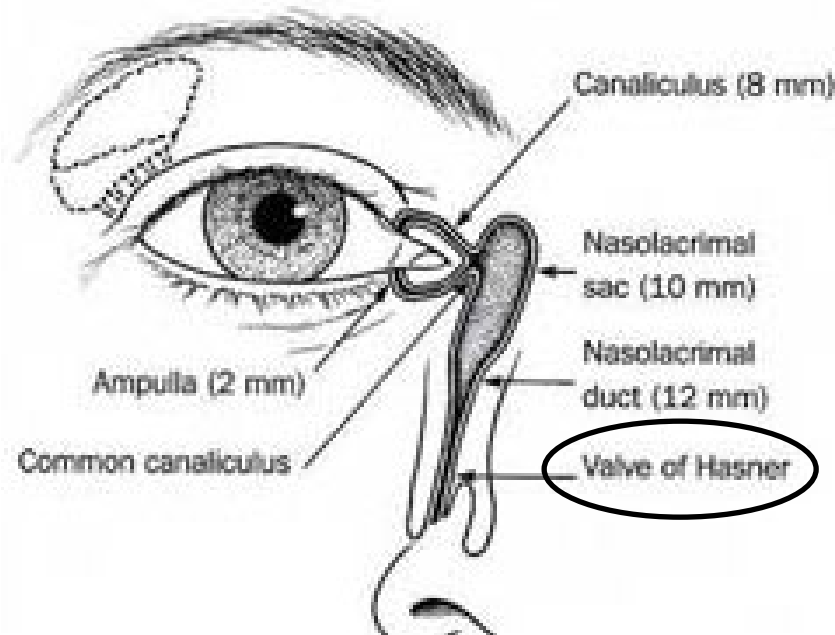
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## The Lacrimal Drainage System



Spiral valve of Hasner



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Bite your tongue! No, it's because the rest experience spontaneous perforation of the valve of Hasner during the first 4-6 weeks of life.

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*OK, but why don't these infants have diagnose-able NLDO in the interval **before** they spontaneously perforate?*

The lacrimal glands don't start producing significant tear volume until ~6 weeks post-partum. (Have you ever noticed that, when they cry, newborns don't shed tears?) And the relative absence of tear-volume during this interval means that the signs of NLDO cannot develop, and thus *most cases of congenital NLDO never become clinically apparent.*



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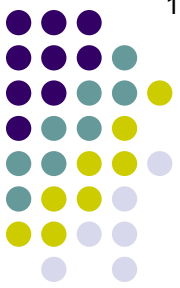


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Bilateral nasolacrimal duct obstruction with epiphora and periocular crusting



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It indicates there is a smoldering, chronic infection in the nasolacrimal sac



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Seemingly not at all, and this nonchalance is an important clue that one is dealing with typical NLDO. That is, if the infant seems distressed by their ophthalmic condition, or is fussy, **the diagnosis of 'typical NLDO' should be questioned.**





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Think about it—distal obstruction means tears get into the sac, but can't get out. Thus, stasis is the order of the day. And stasis of the protein-rich tear renders it an ideal 'broth' in which bacteria can flourish.



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It would suggest the blockage is **above** the sac, at the puncta or canalicular apparatus



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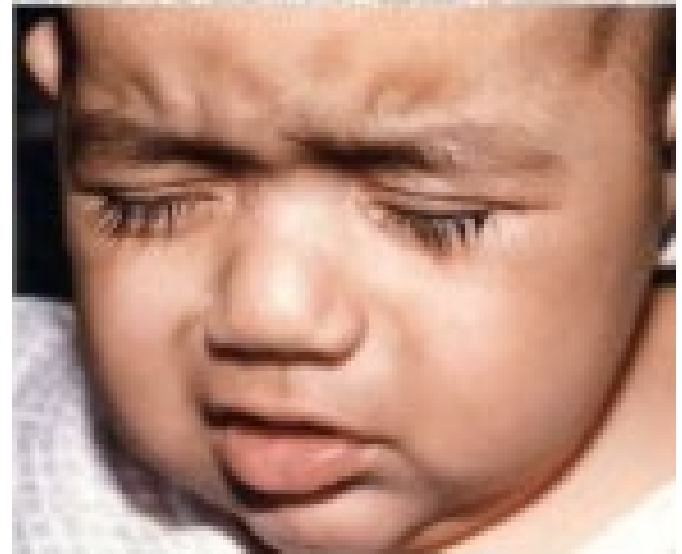
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- Epiphora
- Photophobia
- Blepharospasm

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Epiphora (note also the large corneas,  
as well as the hazy cornea OD)



Photophobia/blepharospasm

Congenital glaucoma



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- How is congenital NLD obstruction managed initially?



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  - If it's unsuccessful, what should you do?





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  - If it's unsuccessful, what should you do? **Repeat in about 2 weeks**



# Q

## ***Congenital Nasolacrimal Duct Obstruction and Dacryoceles***

- In congenital nasolacrimal duct obstruction, where is the site of obstruction typically located? **At the distal end of the NLD**
- Speaking of: What is the classic sign of congenital NLDO? **Epiphora with sticky, mucopurulent discharge**
- How is congenital NLD obstruction managed initially? **Conservatively—massage + topical antibiotic/steroid combo**
- What percent will resolve by 12 months with conservative treatment alone? **~90**
- If conservative treatment is unsuccessful, what is the next step? **NLD probing**
  - At what age should probing be performed? **12 - 15 months**
    - What is the success rate for a first probing at this age? **About 90%**
    - What is the success rate if first attempted after age 24 months? **67%**
  - If it's unsuccessful, what should you do? **Repeat in about 2 weeks**
  - Your NLD obstruction patient has a congenital heart defect. Should prophylactic antibiotics be given prior to probing?



# A

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  - Your NLD obstruction patient has a congenital heart defect. Should prophylactic antibiotics be given prior to probing? **Yes, because probing produces a transient bacteremia**



# Q

## *Acquired Nasolacrimal Duct Obstruction and Dacryoceles*

- In congenital nasolacrimal duct obstruction, where is the site of obstruction typically located? At the distal end of the NLD
- Speaking of: What is the classic sign of congenital NLDO? Epiphora
- How is it treated? Conservative management
- What is the next step?
- If conservative management fails, what is the next step?
- At what age should probing be performed? 12-15 months
  - What is the success rate for a first probing at this age? About 90%
  - What is the success rate if first attempted after age 24 months? 67%
- If it's unsuccessful, what should you do? Repeat in about 2 weeks
- Your NLD obstruction patient has a congenital heart defect. Should prophylactic antibiotics be given prior to probing? Yes, because probing produces a transient bacteremia

*Finally: Is **acquired** NLDO a thing?*



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- Speaking of: What is the classic sign of congenital NLDO? Epiphora
- How is it treated? Indeed it is
- Conservative management
- What is the next step?
- If conservative management fails, what is the next step?
- At what age should probing be performed? 12-15 months
  - What is the success rate for a first probing at this age? About 90%
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*Very broadly speaking, what sort of condition is the cause?*



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- What pathogenesis?
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- Speaking of: What is the classic sign of congenital NLDO? Epiphora
- How is it treated? Conservative
- What pathologic process is the cause? Inflammatory
- If conservative treatment fails, what is the next step?
  - At what age should probing be performed? 12-15 months
    - What is the success rate for a first probing at this age? About 90%
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*Very broadly speaking, what sort of condition is the cause?*

*Inflammatory*

*What two systemic inflammatory conditions should come to mind if you're asked about 2ndry NLDO on the OKAP and/or Boards?*

*--?*

*--?*





# A

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*Very broadly speaking, what sort of condition is the cause?*

Inflammatory

*What two systemic inflammatory conditions should come to mind if you're asked about 2ndry NLDO on the OKAP and/or Boards?*

--Granulomatosis with polyangiitis

--Sarcoid



# Q

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- What pathologic conditions can cause it? What two systemic inflammatory conditions should come to mind if you're asked about 2ndry NLDO on the OKAP and/or Boards?
  - Granulomatosis with polyangiitis
  - Sarcoid
- At what age should probing be performed? 12-15 months
  - What do these conditions have in common that makes them especially prone to inflaming the lacrimal duct? this age? About 90% at or age 24 months? 67%
- If it's unsuccessful, what should you do? Repeat in about 2 weeks
- Your NLD obstruction patient has a congenital heart defect. Should prophylactic antibiotics be given prior to probing? Yes, because probing produces a transient bacteremia



# Q/A

## Acquired Nasolacrimal Duct Obstruction and Dacryocoele

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- How is it treated? Indeed it is
- Conservative management Very broadly speaking, what sort of condition is the cause? Inflammatory
- What potential systemic conditions should you think of? What two systemic inflammatory conditions should come to mind if you're asked about 2ndry NLDO on the OKAP and/or Boards?
  - Granulomatosis with polyangiitis
  - Sarcoid
- At what age should probing be performed? 12-15 months
  - What do these conditions have in common that makes them especially prone to inflaming the lacrimal duct? this age? About 90%
  - They can cause inflammation the adjacent two words er age 24 months? 67%
- If it's unsuccessful, what should you do? Repeat in about 2 weeks
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- How is it treated?
  - Conservative
- What pathologic process is the cause? Inflammatory
- If conservative treatment fails, what is the next step?
  - NLD probing
- At what age should probing be performed? 12-18 months
  - What do these conditions have in common that makes them especially prone to inflaming the lacrimal duct?
    - They can cause inflammation the adjacent paranasal sinuses
- If it's unsuccessful, what should you do? Repeat in about 2 weeks
- Your NLD obstruction patient has a congenital heart defect. Should prophylactic antibiotics be given prior to probing? Yes, because probing produces a transient bacteremia

*Finally: Is acquired NLDO a thing?*

Indeed it is

*Very broadly speaking, what sort of condition is the cause?*

Inflammatory

*What two systemic inflammatory conditions should come to mind if you're asked about 2ndry NLDO on the OKAP and/or Boards?*

--**Granulomatosis with polyangiitis**

--**Sarcoid**

*What do these conditions have in common that makes them especially prone to inflaming the lacrimal duct?*

They can cause inflammation the adjacent paranasal sinuses

this age? About 90%  
 or age 24 months? 67%



# Q

## Acquired Nasolacrimal Duct Obstruction and Dacryoceles

- In congenital nasolacrimal duct obstruction, where is the site of obstruction typically located? At the distal end of the NLD
- Speaking of: What is the classic sign of congenital NLDO? Epiphora
- How is it treated? *Finally: Is acquired NLDO a thing?*  
Indeed it is
- Consequence of untreated congenital NLDO? *By what now-unfavored name was GPA formerly known?*
- What is the most common cause of acquired NLDO? *What is the most common cause?*
- What is the treatment for acquired NLDO? *What treatment should come to mind if you're asked about 2ndry NLDO on the OKAP and/or Boards?*
- If congenital NLDO is not resolved by 12 months, what is the next step?
  - Granulomatosis with polyangiitis
  - Sarcoid
- At what age should probing be performed? 12-15 months
  - What do these conditions have in common that makes them especially prone to inflaming the lacrimal duct?
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Wegener's granulomatosis
- What is the cause of acquired NLDO? *What is the cause?*
- What is the treatment? *What should come to mind if you're asked about 2ndry NLDO on the OKAP and/or Boards?*
- If congenital NLDO is not resolved by 12 months, what is the next step?
  - --Granulomatosis with polyangiitis
  - --Sarcoid
- At what age should probing be performed? 12-15 months
  - What do these conditions have in common that makes them especially prone to inflaming the lacrimal duct? *this age? About 90%*
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Wegener's granulomatosis
- What is the cause of Wegener's granulomatosis? *Why is this name no longer favored?*
- What is the treatment for Wegener's granulomatosis? *If you're asked about 2ndry NLDO on the OKAP and/or Boards?*  
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--Sarcoid
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## ***Congenital Nasolacrimal Duct Obstruction*** and *Dacryoceles*



*Now we'll switch from NLDO...*



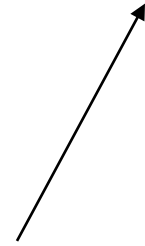
## *Congenital Nasolacrimal Duct Obstruction and **Dacryoceles***

*Now we'll switch from NLDO...to Dacryoceles.*





## *Congenital Nasolacrimal Duct Obstruction and **Dacryoceles***

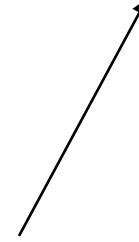


*Now we'll switch from NLDO...to Dacryoceles.*

*But first: Is dacryoceles as common as congenital NLDO?*



## Congenital Nasolacrimal Duct Obstruction and **Dacryoceles**



*Now we'll switch from NLDO...to Dacryoceles.*

*But first: Is dacryoceles as common as congenital NLDO?*

No, it is far less common



## *Congenital Nasolacrimal Duct Obstruction and **Dacryoceles***

*Now we'll switch from NLDO...to Dacryoceles.*

*But first: Is dacryoceles as common as congenital NLDO?*

No, it is far less common

*Does it present unilaterally, or bilaterally?*



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*Now we'll switch from NLDO...to Dacryoceles.*

*But first: Is dacryocoele as common as congenital NLDO?*

No, it is far less common

*Does it present unilaterally, or bilaterally?*

It is  in about  of cases



## Congenital Nasolacrimal Duct Obstruction and **Dacryoceles**

*Now we'll switch from NLDO...to Dacryoceles.*

*But first: Is dacryoceles as common as congenital NLDO?*

No, it is far less common

*Does it present unilaterally, or bilaterally?*

It is unilateral in about 75% of cases

Q

*Congenital Nasolacrimal Duct Obstruction and **Dacryoceles***

- When and how does dacryoceles present?



# A

## *Congenital Nasolacrimal Duct Obstruction and **Dacryoceles***



- When and how does dacryoceles present? At birth, as a bluish cystic swelling in the lacrimal sac region

## *Congenital Nasolacrimal Duct Obstruction and **Dacryoceles***



Dacryoceles

## Q

Congenital Nasolacrimal Duct Obstruction and **Dacryoceles**

- When and how does dacryoceles present? At birth, as a bluish cystic **swelling in the lacrimal sac region**

*Do dacryoceles present with sticky, mucopurulent epiphora a la congenital NLDO?*

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*Is the swelling above, or below the medial canthus?*

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Below

## *Congenital Nasolacrimal Duct Obstruction and **Dacryoceles***



Dacryocoele. Note that the swelling below the medial canthus

## Q

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*Thinking back to Anatomy class...Doesn't a portion of the lacrimal sac extend above the medial canthus?*



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**Below**

*Thinking back to Anatomy class... Doesn't a portion of the lacrimal sac extend above the medial canthus?*  
Yes. The portion extending above the medial canthus is part of the   of the sac, which is defined as that part of the sac superior to the duct of the common canaliculus.

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*If the superior portion of the sac is called the fundus, what is the rest of the sac called?*



# A

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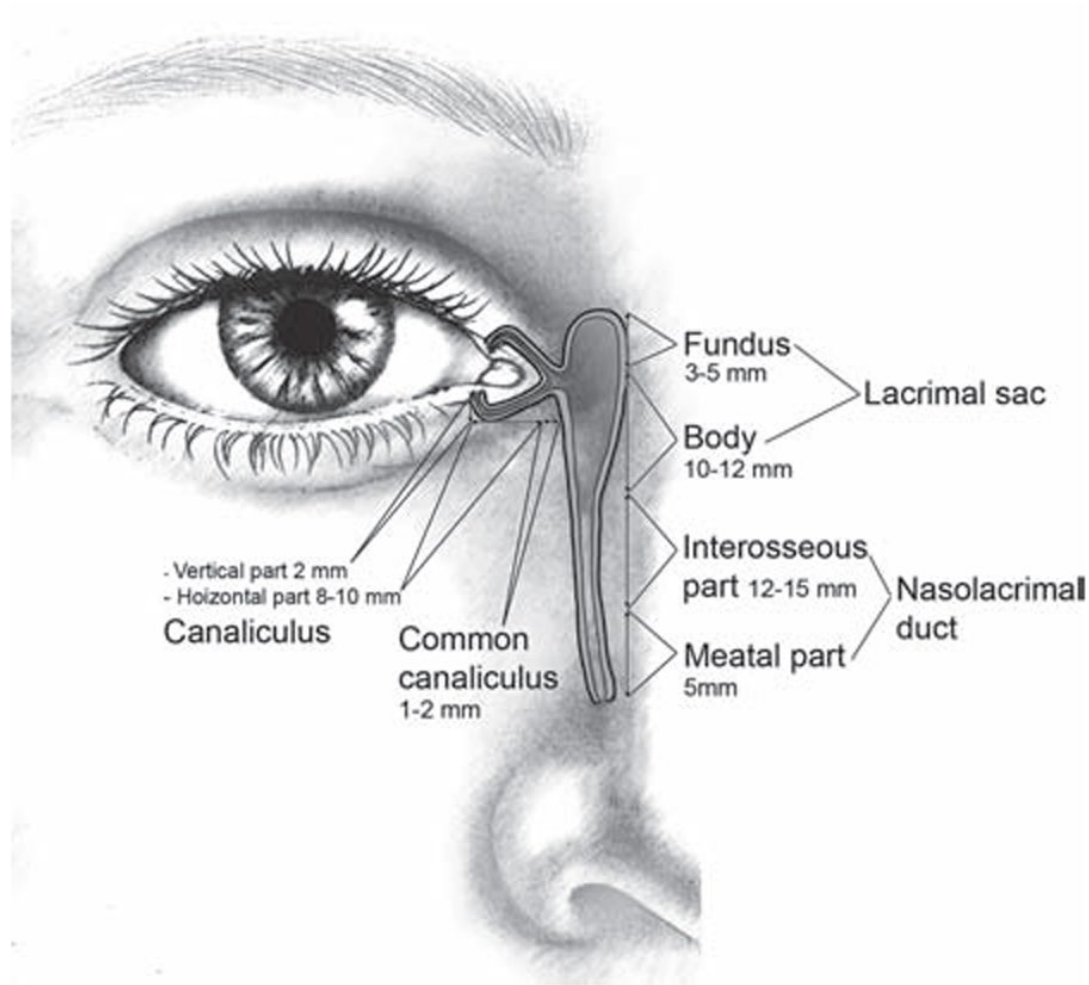
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*If the superior portion of the sac is called the fundus, what is the rest of the sac called?*  
The **body**

## Congenital Nasolacrimal Duct Obstruction and *Dacryoceles*



Lacrimal sac anatomy

## Q

## Congenital Nasolacrimal Duct Obstruction and **Dacryoceles**



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*OK, given that a portion of the sac extends above the medial canthus, why don't dacryoceles (or swelling secondary to congenital NLDO, for that matter) present with swelling above the medial canthus?*

## A

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*OK, given that a portion of the sac extends above the medial canthus, why don't dacryoceles (or swelling secondary to congenital NLDO, for that matter) present with swelling above the medial canthus?*  
Because the lacrimal-sac fundus has a fibrous 'cap' that prevents it from distending

## Q

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*Why is this important?*



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Below

*Why is this important?*  
Because the DDx for congenital swelling above the medial canthus is very different

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*If the swelling is above the canthus, what member of the DDx are of particular concern?*

# A

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Because the DDx for congenital swelling above the medial canthus is very different

*If the swelling is above the canthus, what member of the DDx are of particular concern?*  
A herniation of CNS contents through a bony defect

## Q

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Because the DDx for congenital swelling above the medial canthus is very different

*If the swelling is above the canthus, what member of the DDx are of particular concern?*  
A herniation of CNS contents through a bony defect

*What is the name for such a presentation?*

Q/A

## Congenital Nasolacrimal Duct Obstruction and **Dacryoceles**



- When and how does dacryoceles present? At birth, as a bluish cystic **swelling in the lacrimal sac region**

*Do dacryoceles present with sticky, mucopurulent epiphora a la congenital NLDO?*  
 No. In fact, they generally don't have much epiphora at all.

*Is the swelling above, or below the medial canthus?*  
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*What is the name for such a presentation?*  
 It depends on the contents of the herniation. If it's meninges, it's called a [redacted]. If it's brain tissue, it's an [redacted]. If both are present, it's a [redacted].

## A

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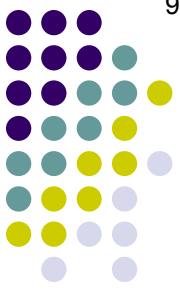
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*Congenital Nasolacrimal Duct Obstruction and **Dacryoceles***



Nasal encephalocele

## Q

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*In addition to its relation to the medial canthus, what other finding should alert you to the possibility that one of these 'oceles' is present?*



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Q

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*Is the swelling above, or below the medial canthus?*  
Below

*Why is this important?*

Because *If you suspect the presence of one of the -oceles, what confirmatory test should be performed? Fine needle biopsy, perhaps?* very different

*If the swelling is above the medial canthus, what is your particular concern?*  
A herniation of meninges and/or brain tissue

*What is the differential diagnosis?*  
It depends on the contents of the herniation. If it's meninges, it's called a **meningocele**. If it's brain tissue, it's an **encephalocele**. If both are present, it's a **meningoencephalocele**.

*In addition to its relation to the medial canthus, what other finding should alert you to the possibility that one of these 'oceles' is present?*

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*If the swelling is below the medial canthus, what is your particular concern?*  
A hemangioma. Um, no. Just no. Please don't stick a needle (or anything else) into what may be the brain.

*What*

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## Q

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*OK then smart guy, what **should** be done?*

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OK then smart guy, what **should** be done?  
Neuroimaging

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If the mass is **pulsatile**

## Q

*Congenital Nasolacrimal Duct Obstruction and **Dacryoceles***

- When and how does dacryoceles present? At birth, as a **bluish cystic swelling** in the lacrimal sac region

*Does it have an angry, inflammatory appearance initially?*

# A

## Congenital Nasolacrimal Duct Obstruction and **Dacryoceles**



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*Does it have an angry, inflammatory appearance initially?*

No

## Q

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- When and how does dacryoceles present? At birth, as a bluish cystic swelling in the lacrimal sac region
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# A

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- When and how does dacryoceles present? At birth, as a bluish cystic swelling in the lacrimal sac region
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## Q

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*Why call it a mucocele?*

# A

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*Why call it a mucocele?*  
It may be filled with mucus



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It may be filled with **mucus**

*Mucus? How could it be filled with mucus?*

# A/Q

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The epithelium of the lacrimal sac contains  
[redacted] cells, which secrete it

# A

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*Why call it a mucocele?*

It may be filled with **mucus**

*Mucus? How could it be filled with mucus?*

The epithelium of the lacrimal sac contains **goblet** cells, which secrete it

## Q

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*Why call it an amniotocoele?*

# A

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*Why call it an amniotocoele?*

It may be filled with amniotic fluid



## Q

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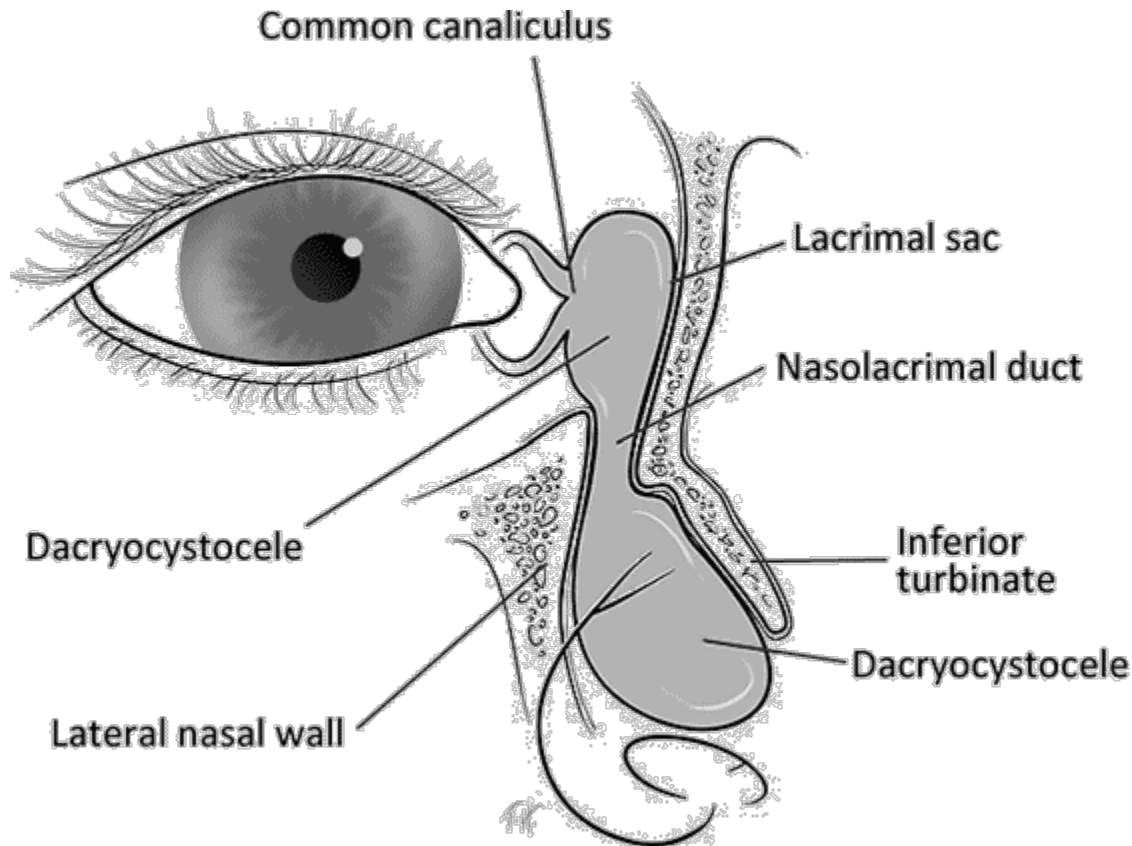
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## Congenital Nasolacrimal Duct Obstruction and *Dacryoce*le



With a dacryocystocele, there is a functional blockage **proximally** as well as a blockage **distally**. This leads to fluid accumulation (amniotic fluid and mucous produced by the lacrimal sac glands) causing distention

## Q

Congenital Nasolacrimal Duct Obstruction and **Dacryoceles**

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Frequently the above-sac obstruction is something impermanent—the classic cause being

something (of the) something something

# A

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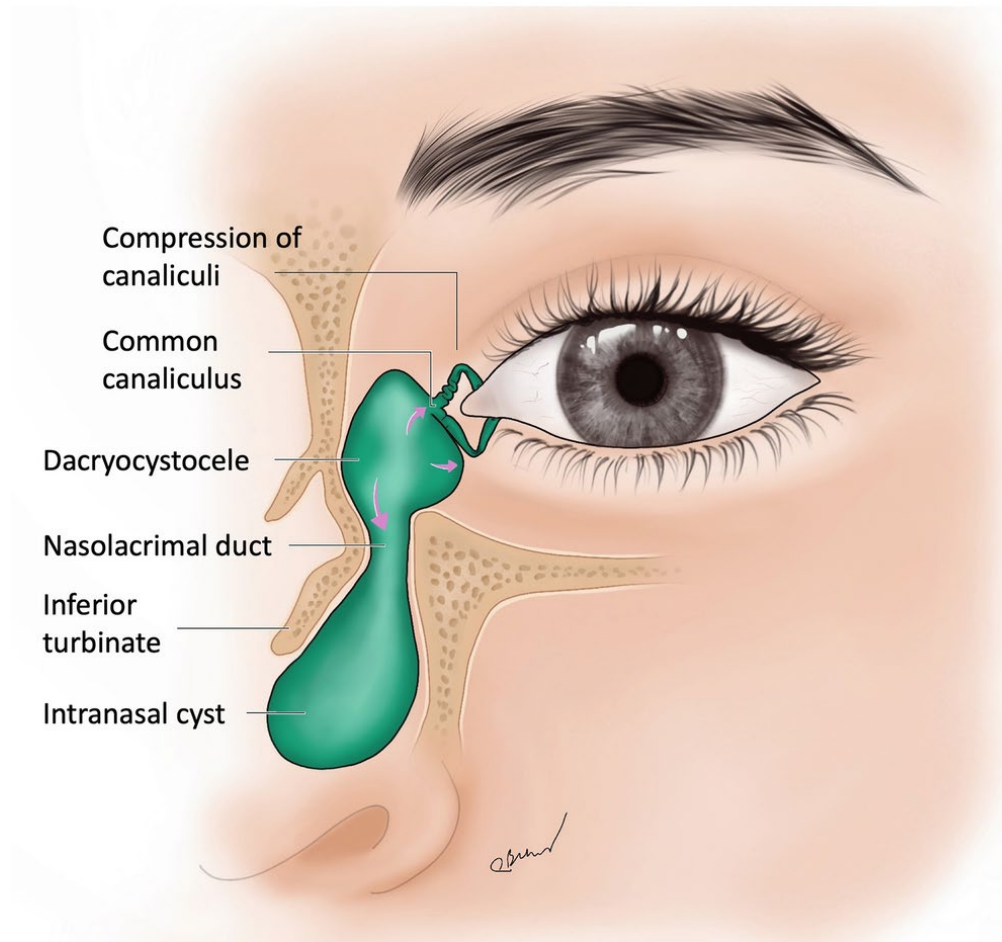


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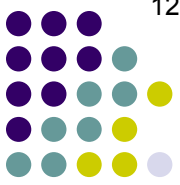
## Congenital Nasolacrimal Duct Obstruction and **Dacryoce**le



Dacryocystocele: Note the kinking of the canaliculus

# A

## Congenital Nasolacrimal Duct Obstruction and **Dacryoceles**



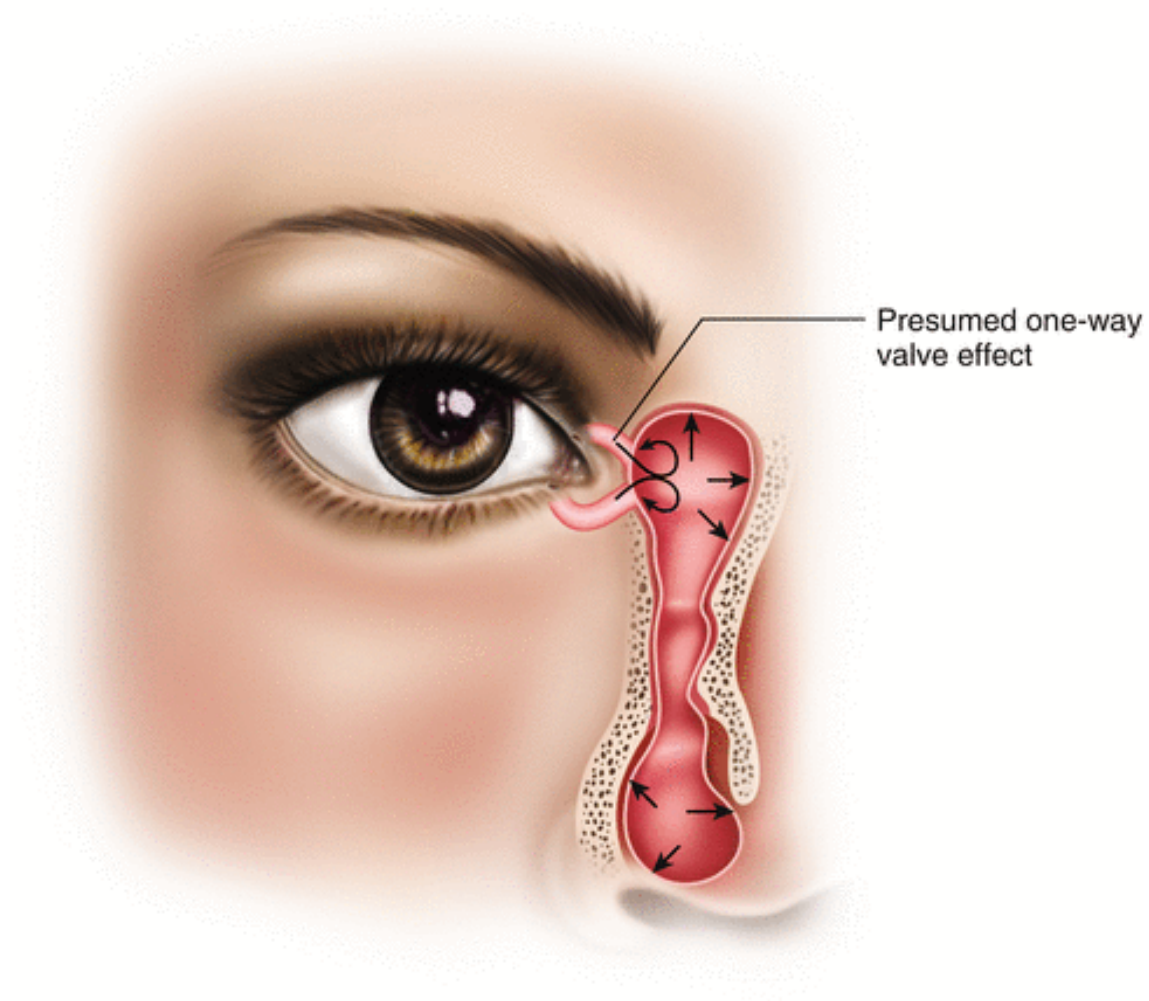
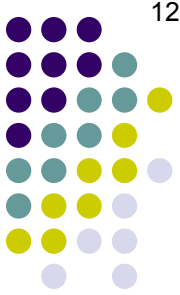
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Frequently the above-sac obstruction is something impermanent—the classic cause being **kinking of the common canaliculus**. Such an obstruction acts as a one-way valve—fluid can pass into the sac, but cannot escape in retrograde fashion via the same route.

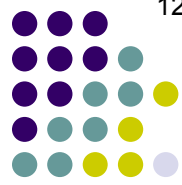


## Congenital Nasolacrimal Duct Obstruction and **Dacryoceles**



Dacryocystocele: One-way valve effect

## Q

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*OK, what if the obstruction above is impassable, eg, in atresia of the canalicular system?  
A dacryocoele can't form, can it?*

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*OK, what if the obstruction above is impassable, eg, in atresia of the canalicular system?*

*A dacryocoele can't form, can it?*

It can, because as mentioned previously, goblet cells of the lacrimal sac secrete mucin, which can accumulate in the sac and thereby produce a dacryocoele

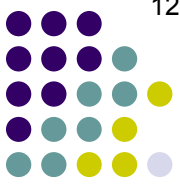
## Q

*Congenital Nasolacrimal Duct Obstruction and **Dacryoce**le*

- When and how does dacryoce
- Give three synonyms for dacryoce
- What is the key anatomic difference between congenital NLD obstruction and dacryoce
- What nasal finding is associated with dacryoceles?

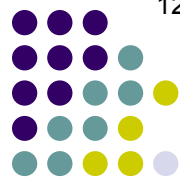
# A

## *Congenital Nasolacrimal Duct Obstruction and **Dacryoce**le*



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- ele; dacryocystoc
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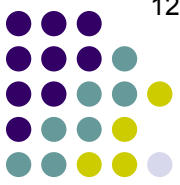
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- What nasal finding is associated with dacryoceles?  
**A nasal mucocoele**

*How does a nasal mucocoele relate anatomically to the dacryoceles?*

## A

Congenital Nasolacrimal Duct Obstruction and **Dacryoceles**

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- What nasal finding is associated with a dacryocoele? **A nasal mucocoele**

*How does a nasal mucocoele relate anatomically to the dacryocoele?*

They are usually connected. Think of the entire lesion as being shaped like a dumbbell, with the mucocoele and dacryocoele as the ends.

## Congenital Nasolacrimal Duct Obstruction and **Dacryoceles**

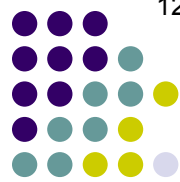


Dacryocystocele is a dumbbell-shaped lesion



## Q

# Congenital Nasolacrimal Duct Obstruction and **Dacryoceles**



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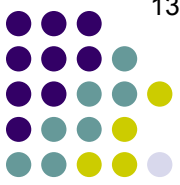
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*How is a nasal mucocoele diagnosed?*

## A

# Congenital Nasolacrimal Duct Obstruction and **Dacryoceles**



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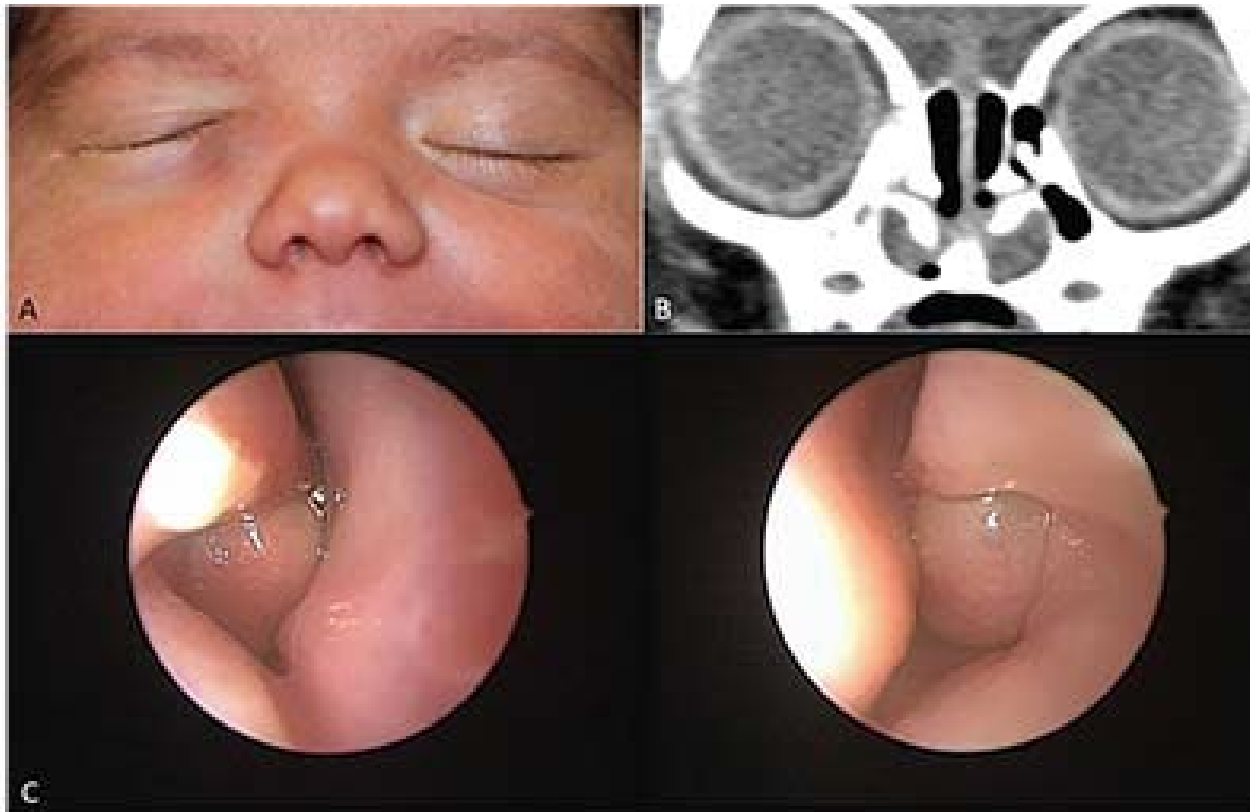
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- What is the key anatomical difference between NLD obstruction and dacryoceles? In NLD obstruction, the obstruction is at the nasolacrimal duct, whereas in dacryoceles, the obstruction is at the lacrimal sac. How is a nasal mucocoele diagnosed? Via a nasal speculum exam. Look yourself, or ask ENT to.

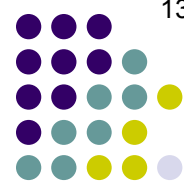
- What nasal finding is associated with a nasal mucocoele?

**A nasal mucocoele**

## Congenital Nasolacrimal Duct Obstruction and *Dacryoceles*



Bilateral intranasal cysts in a patient presenting with a unilateral right dacryoceles:  
A) 1-month-old infant with a right-sided mass below the medial canthus. B) CT of the sinuses with bilateral intranasal cysts below the inferior turbinates. C) Endonasal, endoscopic view of each intranasal cyst below the inferior turbinates.



# Q

## Congenital Nasolacrimal Duct Obstruction and **Dacryoce**

- When and how does dacryoce
  - Give three synonym
  - What is the key ana
  - What nasal finding is
- A nasal mucocele**

*How does a nasal mucocele relate anatomically to the dacryoce*

*They are usually connected. Think of the entire lesion as being shaped like a dumbbell, with the mucocele and dacryoce*

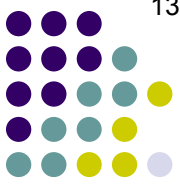
*How is a nasal mucocele diagnosed?*

*Via a nasal speculum exam. Look yourself, or ask ENT to.*

*OK, the patient has a nasal mucocele—so what? Sounds like an ENT problem to me. Why should I care?*

# A

## Congenital Nasolacrimal Duct Obstruction and **Dacryoceles**



- When and how does dacryoceles present? Shortly after birth, as bluish cystic swelling in the lacrimal sac region

- Give three synonyms: Mucocoele; dacryocyst; dacryocoele

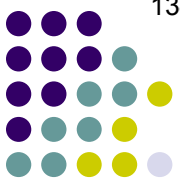
- What is the key anatomical difference between NLD obstruction and dacryoceles? In NLD obstruction, the obstruction is at the nasolacrimal duct, whereas in dacryoceles, the obstruction is at the lacrimal sac. Think of the entire lesion as being shaped like a dumbbell, with the mucocoele and dacryocoele as the ends.

- How is a nasal mucocoele diagnosed? Via a nasal speculum exam. Look yourself, or ask ENT to.

- OK, the patient has a nasal mucocoele—so what? Sounds like an ENT problem to me. Why should I care?

### **A nasal mucocoele**

Infants are obligate nasal breathers (or at the least, they have a **very** strong preference for nasal breathing). A nasal mucocoele will interfere with respiration, especially during feeding. Be sure to ask the mother about feeding problems: whether the infant 'snuffles;' or stops breathing; or seems excessively fussy and frustrated while feeding.



# Q

## Congenital Nasolacrimal Duct Obstruction and **Dacryoce**

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*How is a nasal mucocele diagnosed?*

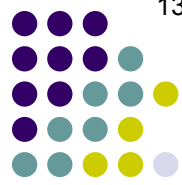
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*What is the treatment for a nasal mucocele?*

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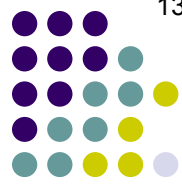
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*What is the treatment for a nasal mucocoele?*

Get ENT to marsupialize it

## Q

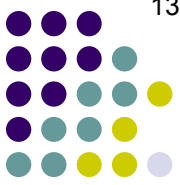
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- What happens, almost inevitably, by age two weeks or so?



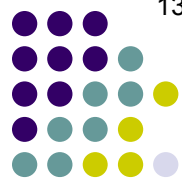
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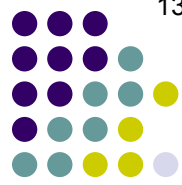
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*Is this infection similar to the smoldering, low-grade infection seen in congenital NLDO?*

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*Is this infection similar to the smoldering, low-grade infection seen in congenital NLDO?*

No, it is much more acute and severe in its presentation

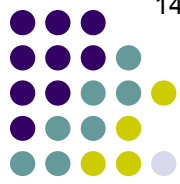
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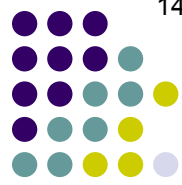
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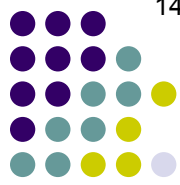
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*Is probing usually needed?*  
In most cases, yes

## Q

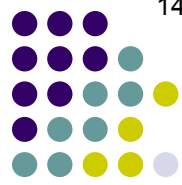
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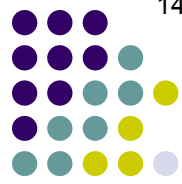
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### *Why are systemic antibiotics needed?*

With their immature immune systems, infants this young are relatively immunocompromised. Thus, without systemic abx, a severe local infection (ie, dacryocystitis) can quickly become a severe disseminated one.

- Pre-infection: Massage and topical abx; probing if needed
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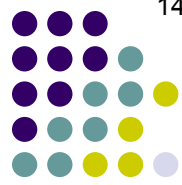
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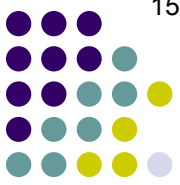
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*What about transcutaneous I&D--is that a reasonable option?*

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Probing + marsupialization of the nasal mucocoele

*What about transcutaneous I&D--is that a reasonable option?*

**No.** I&D runs a significant risk of producing a persistent fistula. Do not I&D a dacryocoele!

- Pre-infection: Massage and topical abx; probing if needed
- Infected: Systemic abx and **surgery**