Q

Hyphema

What is the definition of hyphema?

A

Hyphema

What is the definition of hyphema?

The presence of RBCs in the anterior chamber

Q

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With respect to its extent, there are two types of hyphema—what are they?
--

--

Q/A

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--When the hyphema is extensive enough to form a clot in the AC, it is called a [redacted] hyphema

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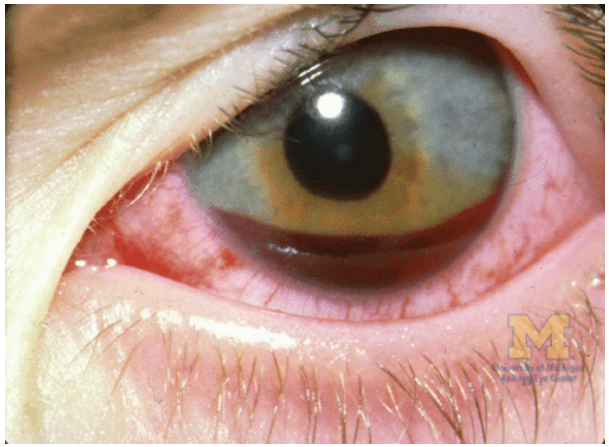
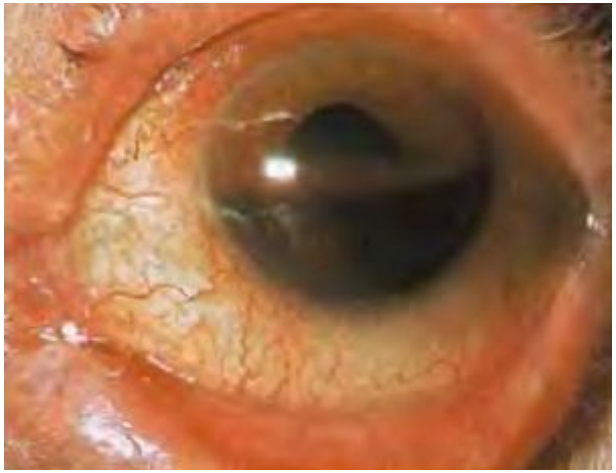
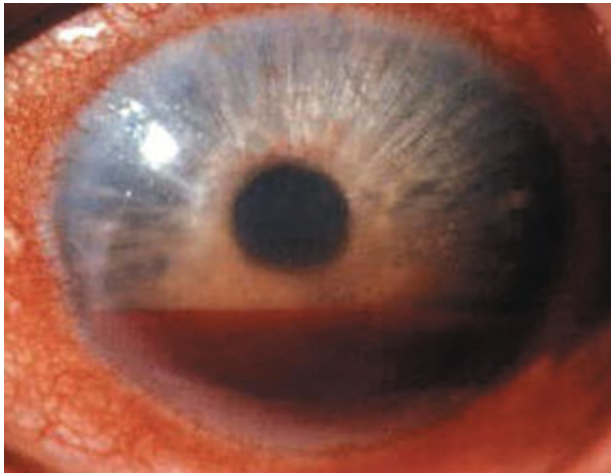
Hyphema







Layered hyphema

Q

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What is the most common cause of hyphema?

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What type of trauma is most commonly implicated?

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What is the most common cause of hyphema?
Trauma

What type of trauma is most commonly implicated?
Blunt

Q

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What type
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What is the mechanism by which blunt trauma causes hyphema?

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What is the mechanism by which blunt trauma causes hyphema?
The globe is incompressible in the sense that its volume cannot be reduced. (It's like a balloon—squeeze it in one place, it has to expand in another.) So when blunt force to the globe compresses its anterior-posterior dimension, the globe compensates by expanding in the equatorial plane—the eye gets momentarily shorter and fatter.

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Who is at risk for traumatic hyphema?

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Young men

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Why are young men at risk?

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Trauma

What type of trauma is most commonly implicated?
Blunt

Who is at risk for traumatic hyphema?
Young men

Why are young men at risk?
Because they're dumb, and do things that lead to getting hit in the eye

Q

Hyphema

- What is the pre-eminent goal in managing hyphema?

A

Hyphema

- What is the pre-eminent goal in managing hyphema? Avoid a re-bleed

Q

Hyphema

- What is the pre-eminent goal in managing hyphema? **Avoid a re-bleed**

Is re-bleeding a common event in hyphema?

Q/A

Hyphema

- What is the pre-eminent goal in managing hyphema? **Avoid a re-bleed**

Is re-bleeding a common event in hyphema?
Not really; only somewhere around % of cases re-bleed

A

Hyphema

- What is the pre-eminent goal in managing hyphema? **Avoid a re-bleed**

Is re-bleeding a common event in hyphema?
Not really; only somewhere around 5% of cases re-bleed

Re-bleed rate per:
--*Glaucoma* book: 5-10%
--*Cornea* book: <5%

Q

Hyphema

- What is the pre-eminent goal in managing hyphema? **Avoid a re-bleed**

Is re-bleeding a common event in hyphema?
Not really; only somewhere around 5% of cases re-bleed

Relative to the initial bleed, when is a re-bleed likely to occur?

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Hyphema

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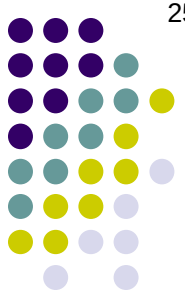
Relative to the initial bleed, when is a re-bleed likely to occur?
3-7 days post-event

Q

Hyphema



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Why then? What happens 3-7 days after the initial bleed?

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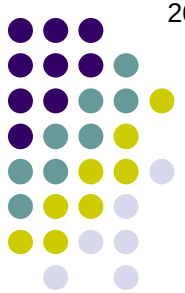
Hyphema



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Relative to the initial bleed, when is a re-bleed likely to occur?
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Why then? What happens 3-7 days after the initial bleed?
This is when the original clot is going through the process of lysis/retraction

Q

Hyphema

- What is the pre-eminent goal in managing hyphema? **Avoid a re-bleed**

Is re-bleeding a common event in hyphema?
Not really; only somewhere around 5% of cases re-bleed

Relative to the initial bleed, when is a re-bleed likely to occur?
3-7 days post-event

What's the big deal about re-bleeding, ie, why is avoiding it so important?

A

Hyphema

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Relative to the initial bleed, when is a re-bleed likely to occur?
3-7 days post-event

What's the big deal about re-bleeding, ie, why is avoiding it so important?
Because the risk of long-term complications goes up significantly if re-bleeding occurs

Q

Hyphema

- What is the pre-eminent goal in managing hyphema? Avoid a re-bleed
- What goal is a close second?

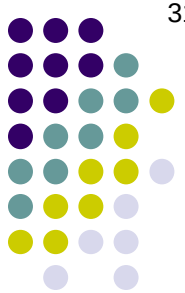
A

Hyphema

- What is the pre-eminent goal in managing hyphema? Avoid a re-bleed
- What goal is a close second? Control IOP

Q

Hyphema



- What is the pre-eminent goal in managing hyphema? Avoid a re-bleed
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What is the mechanism by which hyphema leads to elevated IOP?

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Hyphema

- What is the pre-eminent goal in managing hyphema? Avoid a re-bleed
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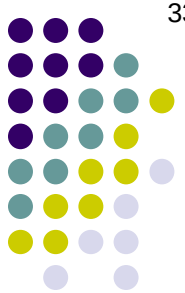
What is the mechanism by which hyphema leads to elevated IOP?
The TM becomes clogged with RBCs, along with the usual inflammatory cells and material. (Not to mention, the inciting trauma may have damaged the angle.)

Q

Hyphema



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What event modestly increases the risk of significant IOP elevation?

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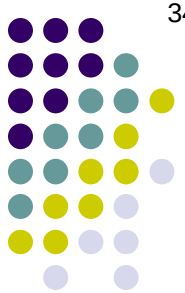

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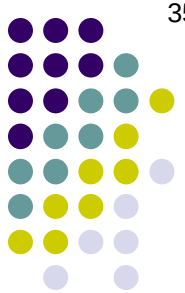
What event modestly increases the risk of significant IOP elevation?
A large hyphema (ie, there is a modest correlation between hyphema size and the incidence of IOP elevation)

Q

Hyphema



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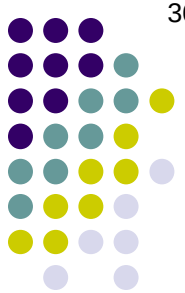
What event **greatly** *increases the risk of significant IOP elevation?*

A

Hyphema



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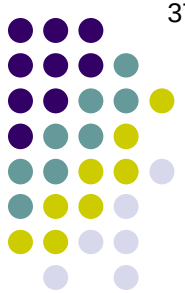
What event **greatly** *increases the risk of significant IOP elevation?*
A re-bleed

Q

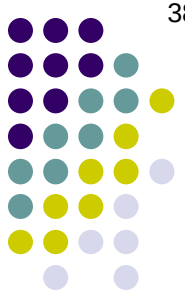
Hyphema



- What is the pre-eminent goal in managing hyphema? Avoid a re-bleed
- What goal is a close second? Control IOP
- Third?

A

Hyphema



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Q

Hyphema

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- Third? **Control inflammation**

Why is inflammation control important?

A

Hyphema

- What is the pre-eminent goal in managing hyphema? Avoid a re-bleed
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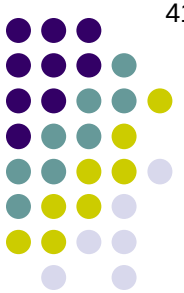
Why is inflammation control important?
To reduce the risk of synechiae formation (and to improve pt comfort of course).

Q

Hyphema



- What is the pre-eminent goal in managing hyphema? Avoid a re-bleed
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- There is another goal that, in young children, is arguably as important as avoiding re-bleed. What is it?

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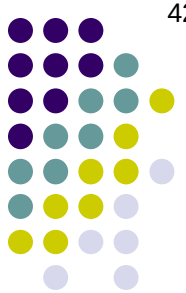

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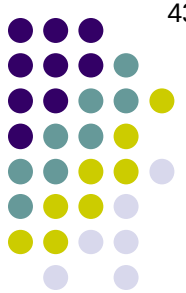
Q

Hyphema



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Briefly, how does a hyphema lead to corneal bloodstaining?

Q/A

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Briefly, how does a hyphema lead to corneal bloodstaining?
RBCs in the AC release abb, which enters the corneal stroma and gets absorbed by keratocytes

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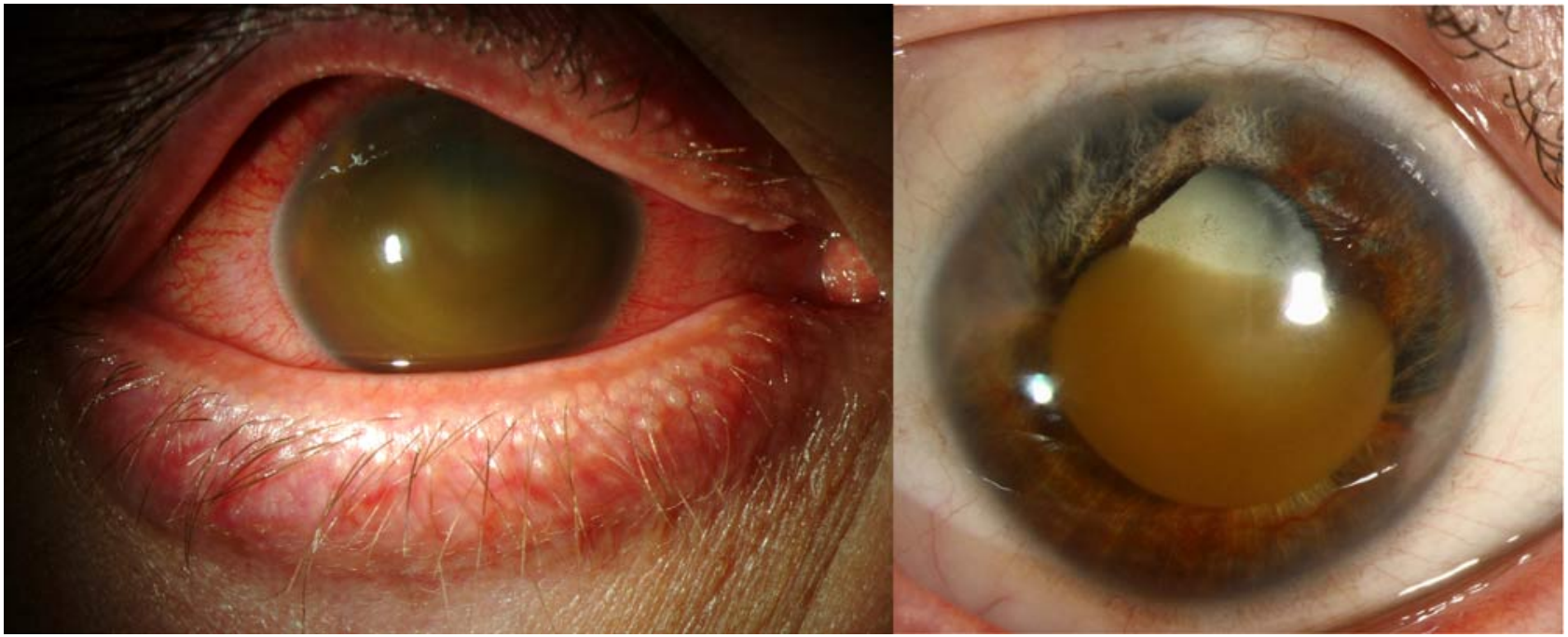

Corneal bloodstaining

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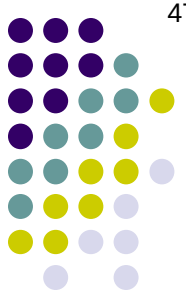

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What complication—common in hyphema—increases the risk of bloodstaining?

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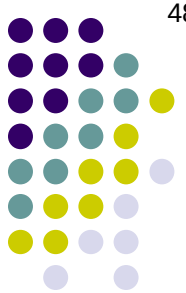

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Why is corneal bloodstaining such a concern in young children?

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Why is corneal bloodstaining such a concern in young children?
Because it is potentially amblyogenic

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Briefly, how does a hyphema lead to corneal bloodstaining?
RBCs in the AC rel… …ets absorbed by keratc…

Is the prognosis for corneal bloodstaining good, or bad?

What complication—common in hyphema—increases the risk of bloodstaining?
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RBCs in the AC rel… …ets absorbed by keratc…

Is the prognosis for corneal bloodstaining good, or bad?
Both. It spontaneously and completely clears (yay!) over a course of months to years (boo!)

What complication—common in hyphema—increases the risk of bloodstaining?
Increased IOP

Why is corneal bloodstaining such a concern in young children?
Because it is potentially amblyogenic

Hyphema

Avoid a re-bleed

Control IOP

Control inflammation

Prevent corneal bloodstaining

tl;dr The treatment goals in managing hyphema

No question—proceed when ready

Q

Hyphema

Avoid a re-bleed

Speaking of managing hyphema…What steps should be taken to minimize the risk of re-bleeding?

-- three words around the clock

-- two/three different words around the clock

--Strict

--Avoidance of

--See the pt unit of time until the hyphema resolves

tl;dr The treatment goals in managing hyphema

A

Hyphema

Avoid a re-bleed

Speaking of managing hyphema…What steps should be taken to minimize the risk of re-bleeding?

-- Shield the eye around the clock
-- Elevate the head around the clock
--Strict bedrest
--Avoidance of anticoagulants
--See the pt daily until the hyphema resolves

Control IOP

Prevent corneal bloodstaining

tl;dr The treatment goals in managing hyphema

Q

Hyphema

Avoid a re-bleed

Speaking of managing hyphema…What steps should be taken to minimize the risk of re-bleeding?

-- Shield the eye around the clock

-- Elevate the head ar

--**Strict bedrest**

--Avoidance of anticoagulants

--See the pt daily until the hyphema resolves

Does this mean the pt should be hospitalized?

Control IOP –

Prevent corneal bloodstaining

tl;dr The treatment goals in managing hyphema

Q/A

Hyphema

Avoid a re-bleed

Speaking of managing hyphema…What steps should be taken to minimize the risk of re-bleeding?

-- Shield the eye around the clock

-- Elevate the head ar

--**Strict bedrest**

--Avoidance of anticoagulants

--See the pt daily until the hyphema resolves

Does this mean the pt should be hospitalized?

If necessary, yes (as is often the case with [redacted])

Control IOP –

Prevent corneal bloodstaining

tl;dr The treatment goals in managing hyphema

A

Hyphema

Avoid a re-bleed

Speaking of managing hyphema…What steps should be taken to minimize the risk of re-bleeding?

-- Shield the eye around the clock

-- Elevate the head ar

--**Strict bedrest**

--Avoidance of anticoagulants

--See the pt daily until the hyphema resolves

Does this mean the pt should be hospitalized?

If necessary, yes (as is often the case with children)

Control IOP –

Prevent corneal bloodstaining

tl;dr The treatment goals in managing hyphema

Q

Hyphema

Avoid a re-bleed

Speaking of managing hyphema…What steps should be taken to minimize the risk of re-bleeding?

-- Shield the eye around the clock

-- Elevate the head around the clock

--Strict bedrest

--**Avoidance of anticoagulants**

--See the pt daily until the hyphema resolves

How might a pt inadvertently anti-coagulate him/herself?

tl;dr The treatment goals in managing hyphema

A

Hyphema

Avoid a re-bleed

Speaking of managing hyphema…What steps should be taken to minimize the risk of re-bleeding?

-- Shield the eye around the clock

-- Elevate the head around the clock

--Strict bedrest

--**Avoidance of anticoagulants**

--See the pt daily until the hyphema resolves

How might a pt inadvertently anti-coagulate him/herself?

By taking aspirin for pain

tl;dr The treatment goals in managing hyphema

Q

Hyphema

Avoid a re-bleed

Speaking of managing hyphema…What steps should be taken to minimize the risk of re-bleeding?

-- Shield the eye around the clock

-- Elevate the head around the clock

--Strict bedrest

--**Avoidance of anticoagulants**

--See the pt daily until the hyphema resolves

How might a pt inadvertently anti-coagulate him/herself?

By taking aspirin for pain

What should you tell the pt in this regard?

tl;dr The treatment goals in managing hyphema

A

Hyphema

Avoid a re-bleed

Speaking of managing hyphema…What steps should be taken to minimize the risk of re-bleeding?

-- Shield the eye around the clock

-- Elevate the head around the clock

--Strict bedrest

--**Avoidance of anticoagulants**

--See the pt daily until the hyphema resolves

How might a pt inadvertently anti-coagulate him/herself?
By taking aspirin for pain

What should you tell the pt in this regard?
To avoid aspirin (and other NSAIDs, just to be safe)

tl;dr The treatment goals in managing hyphema

Q

Hyphema

Avoid a re-bleed

Speaking of managing hyphema…What steps should be taken to minimize the risk of re-bleeding?

-- Shield the eye around the clock

What is aminocaproic acid*, and how does it relate to avoiding re-bleed in hyphema management?*

A

Hyphema

Avoid a re-bleed

Speaking of managing hyphema…What steps should be taken to minimize the risk of re-bleeding?

-- Shield the eye around the clock

What is aminocaproic acid*, and how does it relate to avoiding re-bleed in hyphema management?*

It is a systemic med that acts as a 'clot stabilizer' by enhancing hemostasis during the process of clot fibrinolysis

A

Hyphema

Avoid a re-bleed

Speaking of managing hyphema…What steps should be taken to minimize the risk of re-bleeding?
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What is the rationale behind its use in managing hyphema?

Q

Hyphema

Avoid a re-bleed

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What is the rationale behind its use in managing hyphema?
By enhancing hemostasis, it may reduce the risk of a re-bleed

A

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Aminocaproic acid is not often used in hyphema management—why?

Q

Hyphema

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Aminocaproic acid is not often used in hyphema management—why?
Three reasons:
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--
--

A

Hyphema

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Speaking of managing hyphema…What steps should be taken to minimize the risk of re-bleeding?
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What is aminocaproic acid*, and how does it relate to avoiding re-bleed in hyphema management?*
It is a systemic med that acts as a 'clot stabilizer' by enhancing hemostasis during the process of clot fibrinolysis

What is the rationale behind its use in managing hyphema?
By enhancing hemostasis, it may reduce the risk of a re-bleed

Aminocaproic acid is not often used in hyphema management—why?
Three reasons:
--The evidence regarding its ability to reduce re-bleed risk is equivocal
--It has myriad unwelcome side effects that limit its acceptance
--There is some evidence that the risk of re-bleed goes up when it is stopped

Q

Hyphema

Avoid a re-bleed

Speaking of managing hyphema…What steps should be taken to minimize the risk of re-bleeding?
-- Shield the eye around the clock

What is aminocaproic acid*, and how does it relate to avoiding re-bleed in hyphema management?*
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By enhancing hemostasis, it may reduce the risk of a re-bleed

Aminocaproic acid is not often used in hyphema management—why?
Three reasons:
--The evidence regarding its ability to reduce
--It has **myriad unwelcome side effects** tha
--There is some evidence that the risk of re-b

What are some of the myriad side effects?
--
--
--
--(There are many others)

A

Hyphema

Avoid a re-bleed

Speaking of managing hyphema…What steps should be taken to minimize the risk of re-bleeding?
-- Shield the eye around the clock

What is aminocaproic acid*, and how does it relate to avoiding re-bleed in hyphema management?*
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Aminocaproic acid is not often used in hyphema management—why?
Three reasons:
--The evidence regarding its ability to reduce
--It has **myriad unwelcome side effects** tha
--There is some evidence that the risk of re-b

What are some of the myriad side effects?
--GI upset
--Hypotension (to the point of syncope)
--Confusion
--(There are many others)

Q

Hyphema

Avoid a re-bleed

Control IOP

Control inflammation

Which two classes of meds are first-line in managing IOP in hyphema?

--

--

The treatment goals in managing hyphema

A

Hyphema

Avoid a re-bleed

Control IOP

Control inflammation

Which two classes of meds are first-line in managing IOP in hyphema?

--Aqueous suppressants

--Hyperosmotic agents

The treatment goals in managing hyphema

Q

Hyphema

Avoid a re-bleed

Control IOP

Control inflammation

Which two classes of meds are first-line in managing IOP in hyphema?
Which three drop classes are aqueous suppressants?

--Aqueous suppressants?

--Hyperosmotic agents

The treatment goals in managing hyphema

A

Hyphema

Avoid a re-bleed

Control IOP

Control inflammation

Which two classes of meds are first-line in managing IOP in hyphema?
Which three drop classes are aqueous suppressants?

--Aqueous suppressants?
----β blockers
----α_2 agonists

----Carbonic anhydrase inhibitors (CAIs)
--Hyperosmotic agents

d,dr The treatment goals in managing hyphema

Q

Hyphema

Avoid a re-bleed

Control IOP

Control inflammation

Which two classes of meds are first-line in managing IOP in hyphema?
Which three drop classes are aqueous suppressants?
Which two meds are α_2 agonists?

--Aqueous suppressants
----β blockers
----***α_2 agonists?***

----Carbonic anhydrase inhibitors (CAIs)
--Hyperosmotic agents

The treatment goals in managing hyphema

A

Hyphema

Avoid a re-bleed

Control IOP

Control inflammation

Which two classes of meds are first-line in managing IOP in hyphema?
Which three drop classes are aqueous suppressants?
Which two meds are α_2 agonists?
Which two agents are hyperosmotics?
--Aqueous suppressants
----β blockers
----***α_2 agonists?***
------Apraclonidine (iopidine)
------Brimonidine
----Carbonic anhydrase inhibitors (CAIs)
--Hyperosmotic agents

ii,iii The treatment goals in managing hyphema

Q

Hyphema

Avoid a re-bleed

Control IOP

Control inflammation

Which two classes of meds are first-line in managing IOP in hyphema?
Which three drop classes are aqueous suppressants?
Which two meds are α_2 agonists?
Which two agents are hyperosmotics?
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------Apraclonidine (iopidine)
------Brimonidine
----Carbonic anhydrase inhibitors (CAIs)
--***Hyperosmotic agents?***

----

d,dr The treatment goals in managing hyphema

A

Hyphema

Avoid a re-bleed

Control IOP

Control inflammation

Which two classes of meds are first-line in managing IOP in hyphema?
Which three drop classes are aqueous suppressants?
Which two meds are α_2 agonists?
Which two agents are hyperosmotics?
--Aqueous suppressants
----β blockers
----α_2 agonists
------Apraclonidine (iopidine)
------Brimonidine
----Carbonic anhydrase inhibitors (CAIs)
--***Hyperosmotic agents?***
----Mannitol
----Glycerol

d,dr The treatment goals in managing hyphema

Q

Hyphema

Avoid a re-bleed

Control IOP

Control inflammation

Which two classes of meds are first-line in managing IOP in hyphema?
Which three drop classes are aqueous suppressants?
Which two meds are α_2 agonists?
Which two agents are hyperosmotics?

--Aqueous suppressants

If IOP can't be controlled medically, what surgical procedure should be considered?

------Apraclonidine (iopidine)
------Brimonidine
----Carbonic anhydrase inhibitors (CAIs)
--Hyperosmotic agents
----Mannitol
----Glycerol

The treatment goals in managing hyphema

A

Hyphema

Avoid a re-bleed

Control IOP

Control inflammation

Which two classes of meds are first-line in managing IOP in hyphema?
Which three drop classes are aqueous suppressants?
Which two meds are α_2 agonists?
Which two agents are hyperosmotics?

If IOP can't be controlled medically, what surgical procedure should be considered?
AC washout (we'll have more to say about this procedure later in the slide-set)

--Aqueous suppressants
------Apraclonidine (iopidine)
------Brimonidine
----Carbonic anhydrase inhibitors (CAIs)
--Hyperosmotic agents
----Mannitol
----Glycerol

The treatment goals in managing hyphema

Q

Hyphema

Avoid a re-bleed

Control IOP

Control inflammation

staining

How is intraocular inflammation controlled?

tl;dr The treatment goals in managing hyphema

A

Hyphema

Avoid a re-bleed

Control IOP

Control inflammation

staining

How is intraocular inflammation controlled?
The usual way—with topical steroids and cycloplegics

tl;dr The treatment goals in managing hyphema

A

Hyphema

Avoid a re-bleed

Control IOP

Control inflammation

staining

How is intraocular inflammation controlled?
The usual way—with topical steroids and cycloplegics

Note: Some clinicians forego steroids and cycloplegics in young children, contending that the potential benefit is outweighed by the risk incurred in rasslin' a struggling child to get the drops into her eye.

tl;dr The treatment goals in managing hyphema

Q

Hyphema

Avoid a re-bleed

Control IOP

Control inflammation

Prevent corneal bloodstaining

What steps can be taken to reduce the risk of corneal bloodstaining?

--

--

tl;dr The treatment goals in managing hyphema

A

Hyphema

Avoid a re-bleed

Control IOP

Control inflammation

Prevent corneal bloodstaining

What steps can be taken to reduce the risk of corneal bloodstaining?
--Don't let IOP get out of hand
--Be vigilant clinically in assessing for evidence of bloodstaining, and have a low threshold for intervening surgically if necessary to prevent it from becoming visually significant

tl;dr The treatment goals in managing hyphema

Q

Hyphema

Avoid a re-bleed

Control IOP

Control inflammation

Prevent corneal bloodstaining

What steps can be taken to reduce the risk of corneal bloodstaining?
--Don't let IOP get out of hand
--Be vigilant clinically in assessing for evidence of bloodstaining, and have a low threshold for **intervening surgically** if necessary to prevent it from becoming visually significant

tl;dr The treatment

What surgical procedure are we talking about here?

A

Hyphema

Avoid a re-bleed

Control IOP

Control inflammation

Prevent corneal bloodstaining

What steps can be taken to reduce the risk of corneal bloodstaining?
--Don't let IOP get out of hand
--Be vigilant clinically in assessing for evidence of bloodstaining, and have a low threshold for **intervening surgically** if necessary to prevent it from becoming visually significant

tl;dr The treatment

What surgical procedure are we talking about here?
Again, AC washout. **Speaking of…**

Q

Hyphema

- *Hyphema: AC washout*
  - Goal is to remove two words from AC, not the two different words

A

Hyphema

- *Hyphema: AC washout*
  - Goal is to remove circulating RBCs from AC, not the entire clot

Q

Hyphema

- *Hyphema: AC washout*
  - Goal is to remove circulating RBCs from AC, not the entire clot
  - Criteria triggering AC washout:
    - Any sign of two words

A

Hyphema

- *Hyphema: AC washout*
  - Goal is to remove circulating RBCs from AC, not the entire clot
  - Criteria triggering AC washout:
    - Any sign of corneal bloodstaining

Q

Hyphema

- *Hyphema: AC washout*
  - Goal is to remove circulating RBCs from AC, not the entire clot
  - Criteria triggering AC washout:
    - Any sign of corneal bloodstaining
    - Total hyphema x amount of time

A

Hyphema

- *Hyphema: AC washout*
  - Goal is to remove circulating RBCs from AC, not the entire clot
  - Criteria triggering AC washout:
    - Any sign of corneal bloodstaining
    - Total hyphema x 5 days

Q

Hyphema

- *Hyphema: AC washout*
  - Goal is to remove circulating RBCs from AC, not the entire clot
  - Criteria triggering AC washout:
    - Any sign of corneal bloodstaining
    - **Total hyphema x 5 days**

What complication is likely to occur if a total hyphema is present for more than 5 days?

A

Hyphema

- *Hyphema: AC washout*
  - Goal is to remove circulating RBCs from AC, not the entire clot
  - Criteria triggering AC washout:
    - Any sign of corneal bloodstaining
    - **Total hyphema x 5 days**

What complication is likely to occur if a total hyphema is present for more than 5 days?
Peripheral anterior synechiae

Q

Hyphema

- *Hyphema: AC washout*
  - Goal is to remove circulating RBCs from AC, not the entire clot
  - Criteria triggering AC washout:
    - Any sign of corneal bloodstaining
    - **Total hyphema x 5 days**

If a total hyphema consists of dark red-black blood, by name is it known?

A

Hyphema

- *Hyphema: AC washout*
  - Goal is to remove circulating RBCs from AC, not the entire clot
  - Criteria triggering AC washout:
    - Any sign of corneal bloodstaining
    - **Total hyphema x 5 days**

If a total hyphema consists of dark red-black blood, by name is it known?
An **8-ball hyphema**

Hyphema

8-ball hyphema

Q

Hyphema

- *Hyphema: AC washout*
  - Goal is to remove circulating RBCs from AC, not the entire clot
  - Criteria triggering AC washout:
    - Any sign of corneal bloodstaining
    - Total hyphema x 5 days
    - Hyphema >50% x amount of time

A

Hyphema

- *Hyphema: AC washout*
  - Goal is to remove circulating RBCs from AC, not the entire clot
  - Criteria triggering AC washout:
    - Any sign of corneal bloodstaining
    - Total hyphema x 5 days
    - Hyphema >50% x 8 days

Q

Hyphema

- *Hyphema: AC washout*
  - Goal is to remove circulating RBCs from AC, not the entire clot
  - Criteria triggering AC washout:
    - Any sign of corneal bloodstaining
    - Total hyphema x 5 days
    - **Hyphema >50% x 8 days**

What complication is likely to occur if the IOP is >25 for longer than 5 days?

A

Hyphema

- *Hyphema: AC washout*
  - Goal is to remove circulating RBCs from AC, not the entire clot
  - Criteria triggering AC washout:
    - Any sign of **corneal bloodstaining**
    - Total hyphema x 5 days
    - **Hyphema >50% x 8 days**

What complication is likely to occur if the IOP is >25 for longer than 5 days?
Corneal bloodstaining

Q

Hyphema

- *Hyphema: AC washout*
  - Goal is to remove circulating RBCs from AC, not the entire clot
  - Criteria triggering AC washout:
    - Any sign of corneal bloodstaining
    - Total hyphema x 5 days
    - Hyphema >50% x 8 days
    - Average IOP greater than:
      - 60 x amount of time

A

Hyphema

- *Hyphema: AC washout*
  - Goal is to remove circulating RBCs from AC, not the entire clot
  - Criteria triggering AC washout:
    - Any sign of corneal bloodstaining
    - Total hyphema x 5 days
    - Hyphema >50% x 8 days
    - Average IOP greater than:
      - 60 x 2 days

Q

Hyphema

- *Hyphema: AC washout*
  - Goal is to remove circulating RBCs from AC, not the entire clot
  - Criteria triggering AC washout:
    - Any sign of corneal bloodstaining
    - Total hyphema x 5 days
    - Hyphema >50% x 8 days
    - Average IOP greater than:
      - 60 x 2 days , *or*
      - 35 x amount of time

A

Hyphema

- *Hyphema: AC washout*
  - Goal is to remove circulating RBCs from AC, not the entire clot
  - Criteria triggering AC washout:
    - Any sign of corneal bloodstaining
    - Total hyphema x 5 days
    - Hyphema >50% x 8 days
    - Average IOP greater than:
      - 60 x 2 days , *or*
      - 35 x 7 days

Q

Hyphema

- *Hyphema: AC washout*
  - Goal is to remove circulating RBCs from AC, not the entire clot
  - Criteria triggering AC washout:
    - Any sign of corneal bloodstaining
    - Total hyphema x 5 days
    - Hyphema >50% x 8 days
    - Average IOP greater than:
      - **60 x 2 days , *or***
      - **35 x 7 days**

What devastating complication is likely to occur if IOP is >60 for a couple of days, or >35 for seven days?

A

Hyphema

- *Hyphema: AC washout*
  - Goal is to remove circulating RBCs from AC, not the entire clot
  - Criteria triggering AC washout:
    - Any sign of corneal bloodstaining
    - Total hyphema x 5 days
    - Hyphema >50% x 8 days
    - Average IOP greater than:
      - **60 x 2 days , *or***
      - **35 x 7 days**

What devastating complication is likely to occur if IOP is >60 for a couple of days, or >35 for seven days?
Optic atrophy

Q

Hyphema

- *Hyphema: AC washout*
  - Goal is to remove circulating RBCs from AC, not the entire clot
  - Criteria triggering AC washout:
    - Any sign of corneal bloodstaining
    - Total hyphema x 5 days
    - Hyphema >50% x 8 days
    - Average IOP greater than:
      - 60 x 2 days , *or*
      - 35 x 7 days , *or*
      - 25 x amount of time

A

Hyphema

- *Hyphema: AC washout*
  - Goal is to remove circulating RBCs from AC, not the entire clot
  - Criteria triggering AC washout:
    - Any sign of corneal bloodstaining
    - Total hyphema x 5 days
    - Hyphema >50% x 8 days
    - Average IOP greater than:
      - 60 x 2 days , *or*
      - 35 x 7 days , *or*
      - 25 x 5 days

Q

Hyphema

What systemic condition **must** *be checked for in hyphema pts at risk for it?*

A

Hyphema

What systemic condition **must** *be checked for in hyphema pts at risk for it?*
Sickle-cell anemia

Q

Hyphema

What systemic condition **must** *be checked for in hyphema pts at risk for it?*
Sickle-cell anemia

Broadly speaking, what sort of disease is sickle-cell?

A

Hyphema

What systemic condition **must** *be checked for in hyphema pts at risk for it?*
Sickle-cell anemia

Broadly speaking, what sort of disease is sickle-cell?
A hemoglobinopathy

Q

Hyphema

What systemic condition **must** *be checked for in hyphema pts at risk for it?*
Sickle-cell anemia

Broadly speaking, what sort of disease is sickle-cell?
A hemoglobinopathy

What is the underlying problem?

A

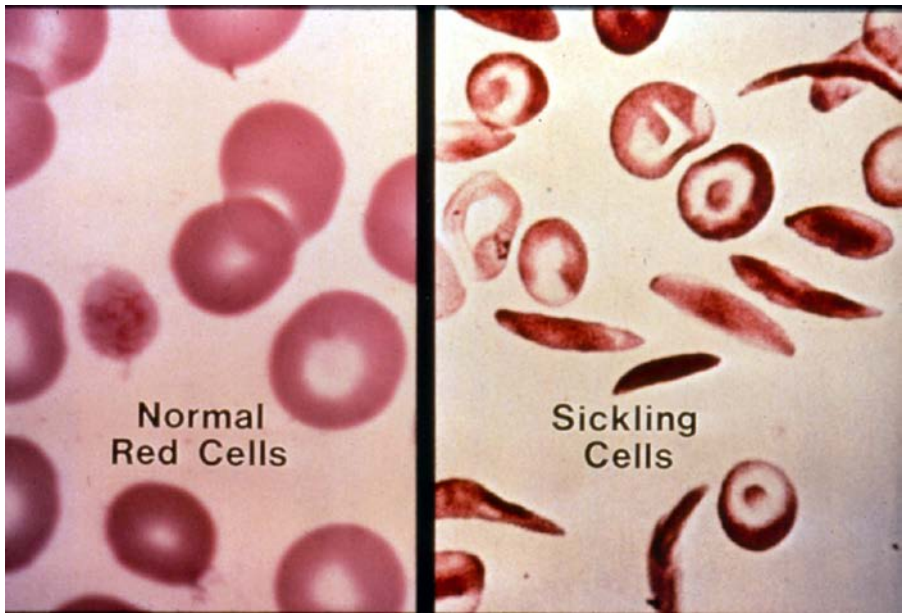
Hyphema

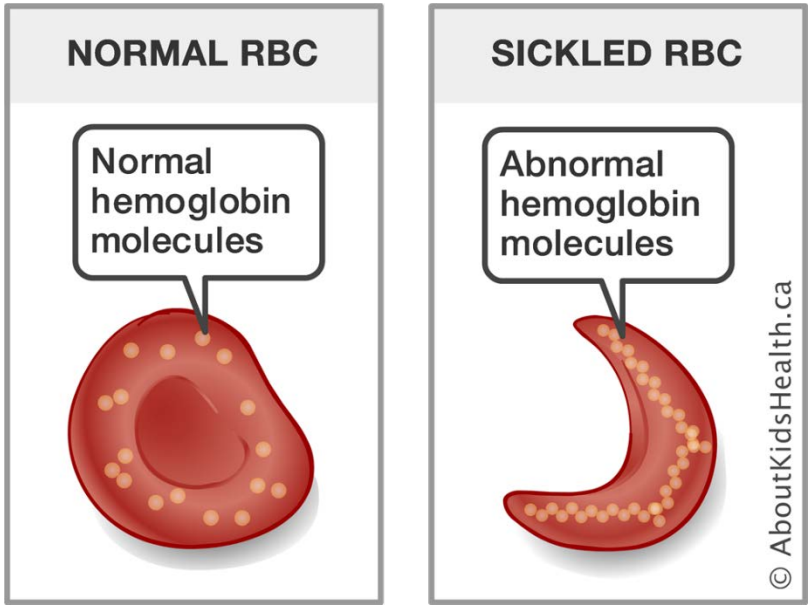
What systemic condition **must** *be checked for in hyphema pts at risk for it?*
Sickle-cell anemia

Broadly speaking, what sort of disease is sickle-cell?
A hemoglobinopathy

What is the underlying problem?
An amino-acid substitution in the hemoglobin beta-chain leads to its malfolding under certain metabolic conditions (eg, low O_2 tension). This results in the characteristic 'sickling' of affected RBCs.

Hyphema





Sickle cell: RBC sickling

Q

Hyphema

What systemic condition **must** *be checked for in hyphema pts at risk for it?*
Sickle-cell anemia

Broadly speaking, what sort of disease is sickle-cell?
A hemoglobinopathy

What is the underlying problem?
An amino-acid substitution in the hemoglobin beta-chain leads to its malfolding under certain metabolic conditions (eg, low O_2 tension). This results in the characteristic 'sickling' of affected RBCs.

What are the four common genotypes of sickle-cell disease?
--
--
--
--

A

Hyphema

What systemic condition **must** *be checked for in hyphema pts at risk for it?*
Sickle-cell anemia

Broadly speaking, what sort of disease is sickle-cell?
A hemoglobinopathy

What is the underlying problem?
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What are the four common genotypes of sickle-cell disease?
--SS
--SC
--S-Thal
--SA

Q

Hyphema

What systemic condition **must** *be checked for in hyphema pts at risk for it?*
Sickle-cell anemia

Broadly speaking, what sort of disease is sickle-cell?
A hemoglobinopathy

What is the underlying problem?
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What are the four common genotypes of sickle-cell disease?

--SS
--SC
--S-Thal
--SA

What is the key difference between SS, SC and S-Thal vs SA disease?

A

Hyphema

What systemic condition **must** *be checked for in hyphema pts at risk for it?*
Sickle-cell anemia

Broadly speaking, what sort of disease is sickle-cell?
A hemoglobinopathy

What is the underlying problem?
An amino-acid substitution in the hemoglobin beta-chain leads to its malfolding under certain metabolic conditions (eg, low O_2 tension). This results in the characteristic 'sickling' of affected RBCs.

What are the four common genotypes of sickle-cell disease?

--SS
--SC
--S-Thal
--SA

What is the key difference between SS, SC and S-Thal vs SA disease?
The first three manifest as clinically apparent dz, whereas SA is an asymptomatic (under most conditions) carrier state--aka 'sickle trait'

Q

Hyphema

What systemic condition **must** *be checked for in hyphema* ***pts at risk for it****?*
Sickle-cell anemia

Broadly speaking, wh
A hemoglobinopathy

In America, people of which two ethnic identities are at greatest risk?
--
--

What is the underlying problem?
An amino-acid substitution in the hemoglobin beta-chain leads to its malfolding under certain metabolic conditions (eg, low O_2 tension). This results in the characteristic 'sickling' of affected RBCs.

What are the four common genotypes of sickle-cell disease?
--SS
--SC
--S-Thal
--SA

A

Hyphema

What systemic condition **must** *be checked for in hyphema* ***pts at risk for it****?*
Sickle-cell anemia

Broadly speaking, wh
A hemoglobinopathy

In America, people of which two ethnic identities are at greatest risk?
--African-American
--Hispanic-American
(People of Mediterranean and Southeast Asian ancestry are also at some risk)

What is the underlying problem?
An amino-acid substitution in the hemoglobin beta-chain leads to its malfolding under certain metabolic conditions (eg, low O_2 tension). This results in the characteristic 'sickling' of affected RBCs.

What are the four common genotypes of sickle-cell disease?
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Q

Hyphema

What systemic condition **must** *be checked for in hyphema* ***pts at risk for it****?*
Sickle-cell anemia

Broadly speaking, wh
A hemoglobinopathy

In America, people of which two ethnic identities are at greatest risk?
--African-American: 1 in ***?***
--Hispanic-American: 1 in ***?***

What is the ur

What is the sickle-cell dz birthrate for these groups?

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In America, people of which two ethnic identities are at greatest risk?
--African-American: 1 in 500
--Hispanic-American: 1 in 36,000

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What percent of African-Americans test positive for sickle trait*?*

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What percent of African-Americans test positive for sickle trait*?*
A whopping 8% (1 in 12)!

Q

Hyphema

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Broadly speaking, what sort of disease is sickle-cell?
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Because being sickle-positive:
1)
2)

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Which is/are associated with increased risk and a need for modified management?

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All of them

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Q

Hyphema

What systemic cond *pts at risk for it?*
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What two complications are sickle pts at greater risk of developing?

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What two complications are sickle pts at greater risk of developing?
Elevated IOP and optic atrophy

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Because of the physical characteristics of their RBCs. Normal RBCs are very flexible and change shape easily; thus, they are able to slip easily through the TM. In contrast, sickled RBCs are stiff, and therefore cannot readily change conformation to fit through the TM. Thus, sickled RBCs will 'pile up' at the TM, effectively occluding it and thereby causing IOP to spike.

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Why are the optic nerves in sickle pts at greater risk of atrophying?

A

Hyphema

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Why are the optic nerves in sickle pts at greater risk of atrophying?
As is the case throughout their bodies, the baseline status of the microcirculation of the optic nerve in sicklers is marginal—even under the best of circumstances, their optic nerves are just getting by. Thus, their optic nerves are vulnerable to damage stemming from anything that compromises their already compromised circulation, one of which is elevated IOP.

A

Hyphema

What systemic cond *pts at risk for it?*
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What two complications are sickle pts at greater risk of developing?
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As is the case throughout their bodies, the baseline status of the microcirculation of the optic nerve in sicklers is marginal—even under the best of circumstances, their optic nerves are just getting by. Thus, their optic nerves are vulnerable to damage stemming from anything that compromises their already compromised circulation, one of which is elevated IOP. Because of this, the optic nerve in sickle pts will sustain ***more*** damage at ***lower*** IOPs for ***shorter*** durations than will the optic nerves of non-sickle pts.

Q

Hyphema

What systemic condition **must** *be checked for in hyphema pts at risk for it?*
Sickle-cell anemia

How does being sickle+ impact hyphema management?

?

What is the underlying problem?
An amino-acid substitution in the hemoglobin beta-chain leads to its malfolding under certain metabolic conditions (eg, low O_2 tension). This results in the characteristic 'sickling' of affected RBCs.

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A

Hyphema

What systemic condition **must** *be checked for in hyphema pts at risk for it?*
Sickle-cell anemia

How does being sickle+ impact hyphema management?
By changing:
--The agents employed in *medical* management, and
--The threshold for advancing to *surgical* management

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Which two classes of meds are first-line in managing IOP in hyphema?

These are the agents commonly employed in managing IOP in hyphema. Which ones should be **avoided** in sicklers?

--Aqueous suppressants
----***β blockers?***
----α_2 agonists
------***Apraclonidine (iopidine)?***
------***Brimonidine?***
----***Carbonic anhydrase inhibitors (CAIs)?***
--Hyperosmotic agents?
----***Mannitol?***
----***Glycerol?***

1) places a hyphema pt at higher risk for complications; and
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A

Hyphema

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--Hyperosmotic agents?

----**Mannitol!**

----**Glycerol!**

Remember: These are the agents ***not*** to use in sicklers!

1) places a hyphema pt at higher risk for complications; and

2) impacts how a hyphema should be managed

Q

Hyphema

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----**Glycerol**

Why must apraclonidine be avoided in sicklers?

1) places a hyphema pt at higher risk for complications; and

2) impacts how a hyphema should be managed

Q/A

Hyphema

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----**Mannitol**

----**Glycerol**

Why must apraclonidine be avoided in sicklers?

It has too much [redacted] stimulatory effect

receptor class

1) places a hyphema pt at higher risk for complications; and

2) impacts how a hyphema should be managed

A

Hyphema

What systemic condition **must** *be checked for in hyphema pts at risk for it?*
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----**Mannitol**
----**Glycerol**

Why must apraclonidine be avoided in sicklers?
It has too much α_1 stimulatory effect

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Q

Hyphema

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Why must apraclonidine be avoided in sicklers?
It has too much α_1 stimulatory effect

Which α_1 stimulation effect is so deleterious that it precludes the use of apraclonidine in sicklers?

1) places a hyphema pt at higher risk for complications; and
2) impacts how a hyphema should be managed

A

Hyphema

What systemic condition **must** *be checked for in hyphema pts at risk for it?*
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Why must apraclonidine be avoided in sicklers?
It has too much α_1 stimulatory effect

Which α_1 stimulation effect is so deleterious that it precludes the use of apraclonidine in sicklers?
Vasoconstriction of the anterior segment vasculature

1) places a hyphema pt at higher risk for complications; and
2) impacts how a hyphema should be managed

Q

Hyphema

*What systemic condition **must** be checked for in hyphema pts at risk for it?*

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----**Mannitol**

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Why should topical CAIs be avoided in sicklers?

1) places a hyphema pt at higher risk fo

2) impacts how a hyphema should be m

A

Hyphema

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----**Mannitol**
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Why should topical CAIs be avoided in sicklers?
Because they will acidify the AC, and an acidic environment promotes RBC sickling

1) places a hyphema pt at higher risk fo
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Q

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Why should topical CAIs be avoided in sicklers?
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There's an additional reason **systemic** *CAIs should be avoided—what is it?*

A

Hyphema

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Why should topical CAIs be avoided in sicklers?
Because they will acidify the AC, and an acidic environment promotes RBC sickling

There's an additional reason **systemic** *CAIs should be avoided—what is it?*
Because of their diuretic effect, they may lead to hemoconcentration and thus circulatory compromise (especially if the pt is already dehydrated)

Q

Hyphema

*What systemic condition **must** be checked for in hyphema pts at risk for it?*

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How does being sickle+ impact hyphema management?

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Why should the hyperosmotics be avoided?

1) places a hyphema pt at higher risk for complications, and

2) impacts how a hyphema should be managed

A

Hyphema

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----**Mannitol**
----**Glycerol**

Why should the hyperosmotics be avoided?
For the same reason as systemic CAIs--they may lead to hemoconcentration and thus circulatory compromise

1) places a hyphema pt at higher risk for complications, and
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Hyphema

What systemic condition **must** *be checked for in hyphema pts at risk for it?*
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What is the underlying problem?
An amino-acid substitution in the hemoglobin beta-chain leads to its malfolding
n). This results in the

Next let's take a look at the IOP thresholds for doing an AC washout in sickle-cell pts

What are the four common genotypes of sickle-cell disease?
--SS!
--SC!
--S-Thal!
--SA!

Why must sickle-status be assessed in at-risk hyphema pts?
Because being sickle-positive:
1) places a hyphema pt at higher risk for complications; and
2) impacts how a hyphema should be managed

(No question—proceed when ready)

Q

Hyphema

- *Hyphema: AC washout*
  - Goal is to remove circulating RBCs from AC, not the entire clot
  - Criteria triggering AC washout:
    - Any signs of corneal bloodstaining
    - Total hyphema x 5 days
    - Hyphema >50% x 8 days
    - Average IOP greater than:
      - 60 x 2 days , *or*
      - 35 x 7 days , *or*
      - 25 x 5 days

★ ***If sickle-positive:*** Average IOP greater than: ★

- 25 x amount of time

A

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★ ***If sickle-positive:*** Average IOP greater than: ★

- 25 x 1 day

Q

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- 25 x 1 day , *or*
- Repeated spikes >30 for amount of time

A

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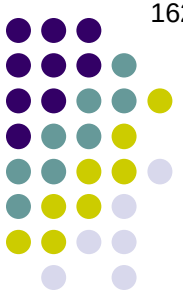
      - 25 x 5 days

Note the management dilemma in sickle-cell—IOP control is absolutely essential because of their pre-existing optic-nerve vulnerability, but sickle-status takes most medical IOP-lowering agents out of your hands

★ ***If sickle-positive:*** Average IOP greater than: ★

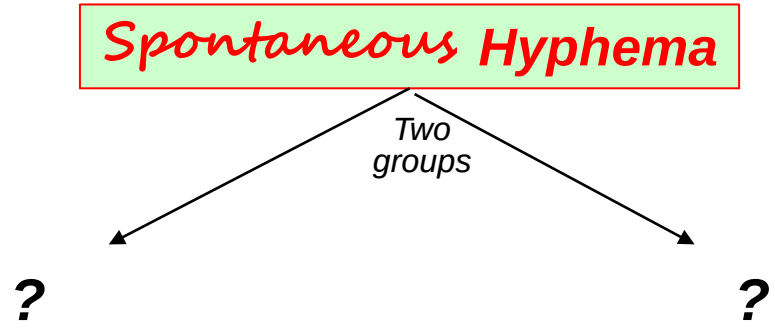
- 25 x 1 day , *or*
- Repeated spikes >30 for 2 days

Spontaneous Hyphema



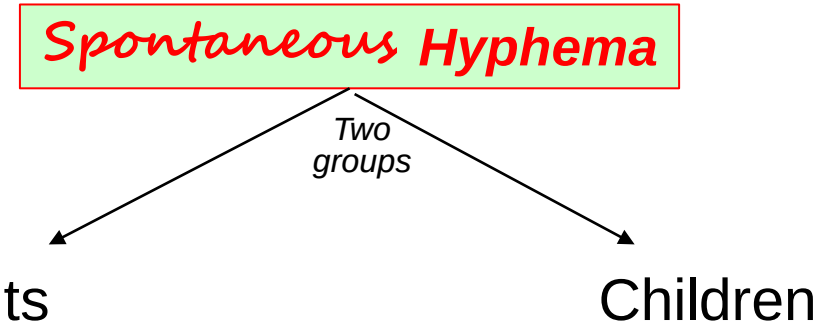
Next, let's turn our attention to the subject of **spontaneous** *hyphema*

Q



When considering the DDx for spontaneous hyphema, we need to think in terms of two groups. What are they?

A



When considering the DDx for spontaneous hyphema, we need to think in terms of two groups. What are they?

Q

Spontaneous Hyphema

- Adults
  - ?
  - ?
  - ?
- Children

What are the three most common causes of spontaneous hyphema in adults?

A

Spontaneous Hyphema

- Adults
  - Neovascularization
  - Neovascularization
  - Neovascularization
- Children

What are the three most common causes of spontaneous hyphema in adults?

Q

Spontaneous Hyphema

- Adults
  - Neovascularization
  - Neovascularization
  - Neovascularization
- Children

What are the three most common causes of spontaneous hyphema in adults?

Yo Dr Flynn, you listed neovascularization three times. This a mistake, or what?

A

Spontaneous Hyphema

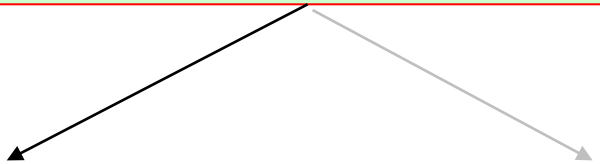
- Adults
  - Neovascularization
  - Neovascularization
  - Neovascularization
- Children

What are the three most common causes of spontaneous hyphema in adults?

Yo Dr Flynn, you listed neovascularization three times. This a mistake, or what?
It's 'or what,' actually. The point being made here is that neovascularization of the anterior segment is the final common pathway for the conditions that commonly produce spontaneous hyphema in adults.

Q

Spontaneous Hyphema



Adults

Children

- Neovascularization 2ndry to…
- Neovascularization 2ndry to…
- Neovascularization 2ndry to…

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OK, then, what are the three sorts of common conditions that produce the neo that produces spontaneous hyphema in adults?
--
--
--

A

Spontaneous Hyphema

- Adults
  - Neovascularization 2ndry to…ischemia
  - Neovascularization 2ndry to…neoplasm
  - Neovascularization 2ndry to…inflammation
- Children

Yo Dr Flynn, you listed neovascularization three times. This a mistake, or what?
It's 'or what,' actually. The point being made here is that neovascularization of the anterior segment is the final common pathway for the conditions that commonly produce spontaneous hyphema in adults.

OK, then, what are the three sorts of common conditions that produce the neo that produces spontaneous hyphema in adults?
--Ischemia
--Neoplasm
--Inflammation

Q

Spontaneous Hyphema

- Adults
  - Ischemia
  - Neoplasm
  - Inflammation
- Children

? ➡ HYPHEMA

Speaking of common pathways in hyphema…Let's work backwards through the process that leads to free blood in the AC.

What event sets up the eye to get a hyphema?

A

Spontaneous Hyphema

- Adults
  - Ischemia
  - Neoplasm
  - Inflammation
- Children

A.S.
Neo ➡ HYPHEMA

Speaking of common pathways in hyphema…Let's work backwards through the process that leads to free blood in the AC.

What event sets up the eye to get a hyphema?

Neovascularization of the anterior segment

Q

Spontaneous Hyphema

- Adults
  - Ischemia
  - Neoplasm
  - Inflammation
- Children

? ➡ A.S. Neo ➡ HYPHEMA

Speaking of common pathways in hyphema…Let's work backwards through the process that leads to free blood in the AC.

What event sets up the eye to get a hyphema?

Neovascularization of the anterior segment

What incites the development of anterior segment neo?

A

Spontaneous Hyphema

- Adults
  - Ischemia
  - Neoplasm
  - Inflammation
- Children

Release of VEGF, other vascular growth factors ➡ A.S. Neo ➡ HYPHEMA

Speaking of common pathways in hyphema…Let's work backwards through the process that leads to free blood in the AC.

What event sets up the eye to get a hyphema?

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What incites the development of anterior segment neo?

The presence of VEGF and other vascular growth factors

Q

Spontaneous Hyphema

- Adults
  - Ischemia
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The presence of VEGF and other vascular growth factors

What event leads to the release of VEGF, etc?

A

Spontaneous Hyphema

- Adults
  - Ischemia
  - Neoplasm
  - Inflammation
- Children

Hypoxia ➡ Release of VEGF, other vascular growth factors ➡ A.S. Neo ➡ HYPHEMA

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What event leads to the release of VEGF, etc?

Hypoxia

Q

Spontaneous Hyphema

- Adults
  - **Ischemia** → Hypoxia ➡ Release of VEGF, other vascular growth factors ➡ A.S. Neo ➡ HYPHEMA
  - Neoplasm
  - Inflammation
- Children

Broadly speaking, ischemia of one of two 'structures' (note the 'scare quotes') is responsible for producing anterior segment neo. What are these structures?

A

Spontaneous Hyphema

- Adults
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  - Neoplasm
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Broadly speaking, ischemia of one of two 'structures' (note the 'scare quotes') is responsible for producing anterior segment neo.
What are these structures?
The Retina, and the Entire Eye

Q

Spontaneous Hyphema

- Adults
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Broadly speaking, ischemia of one of two 'structures' (note the 'scare quotes') is responsible for producing anterior segment neo. What are these structures?

The **Retina**, and the Entire Eye

What retinal ischemic events are notorious for producing anterior segment neo?

A

Spontaneous Hyphema

- Adults
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- Children

Broadly speaking, ischemia of one of two 'structures' (note the 'scare quotes') is responsible for producing anterior segment neo. What are these structures?

The **Retina**, and the Entire Eye

What retinal ischemic events are notorious for producing anterior segment neo?

Proliferative diabetic retinopathy (PDR), and retinal vein occlusions—either central (CRVO) or branch (BRVO)

Q

Spontaneous Hyphema

- Adults
  - **Ischemia** → Hypoxia ➡ Release of VEGF, other vascular growth factors ➡ A.S. Neo ➡ HYPHEMA
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The Retina, and the **Entire Eye**

What is the name of the condition in which the entire eye is ischemic?

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What is the name of the condition in which the entire eye is ischemic?

Ocular ischemic syndrome (OIS)

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In OIS, where in the vascular tree is the occlusion found?

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Ocular ischemic syndrome (OIS)

In OIS, where in the vascular tree is the occlusion found?

The ipsilateral carotid

Q

Spontaneous Hyphema

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  - **Neoplasm** → Hypoxia ⇨ Release of VEGF, other vascular growth factors ⇨ A.S. Neo ⇨ HYPHEMA
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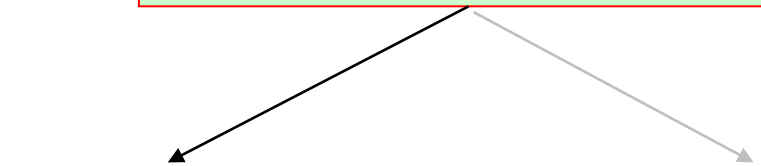
OK, I get how ischemia leads to hypoxia, but how does a neoplasm?

A

Spontaneous Hyphema



Adults

Children

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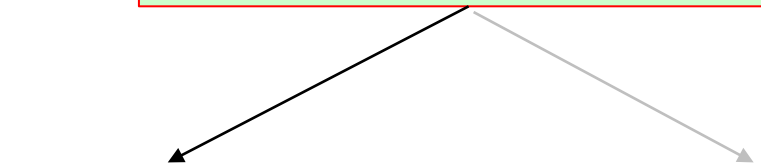
OK, I get how ischemia leads to hypoxia, but how does a neoplasm?
Some neoplasms grow so rapidly that they end up outgrowing their blood supply. Tumor cells located at the fringe of the available blood supply may be hypoxic, which leads to their production and release of pro-vascular growth factors resulting in neo, and hyphema.

Q

Spontaneous Hyphema



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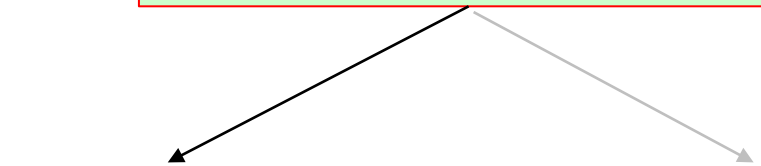
Which neoplasm is perhaps best known to be associated with hyphema in adults?

A

Spontaneous Hyphema



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Which neoplasm is perhaps best known to be associated with hyphema in adults?
Uveal melanoma

Q

Spontaneous Hyphema

- Adults
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- Children

Hypoxia ➡ Release of VEGF, other vascular growth factors ➡ A.S. Neo ➡ HYPHEMA

How does inflammation lead to neo, and then hyphema?

A

Spontaneous Hyphema

- Adults
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- Children

Hypoxia ➡ Release of VEGF, other vascular growth factors ➡ A.S. Neo ➡ HYPHEMA

How does inflammation lead to neo, and then hyphema?
This has yet to be fully elucidated, and the *BCSC* books do not address the ‘mechanism’ question

Q

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Which forms of uveitis are well-known to be associated with hyphema in adults?
--
--

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--Herpetic uveitides
--Fuch heterochromic iridocyclitis (FHI)

Q

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Which herpetic uveitides are especially notorious for hyphema?
--
--

A

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Which herpetic uveitides are especially notorious for hyphema?
--VZV
--HSV

Q

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Which herpetic uveitides are especi
--VZV: Iris atrophy is…***?***
--HSV: Iris atrophy is…***?***

VZV and HSV both produce iris atrophy. In what key way do they differ in this regard?

A

Spontaneous Hyphema

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Which herpetic uveitides are especially notorious for hyphema?
--VZV: Iris atrophy is…**sectoral**
--HSV: Iris atrophy is…**diffuse**

VZV and HSV both produce iris atrophy. In what key way do they differ in this regard?
In VZV, the atrophy is **sectoral**, whereas in HSV it is **diffuse**

Q

Spontaneous Hyphema

Who is the typical FHI pt?

EMA

--Herpetic uveitides

--**Fuch heterochromic iridocyclitis (FHI)**

A

Spontaneous Hyphema

Who is the typical FHI pt?
A middle-aged adult

EMA

--Herpetic uveitides

--**Fuch heterochromic iridocyclitis (FHI)**

Q

Who is the typical FHI pt?
A middle-aged adult

Is there a gender predilection?

--Herpetic uveitides

--**Fuch heterochromic iridocyclitis (FHI)**

A

Spontaneous Hyphema

Who is the typical FHI pt?
A middle-aged adult

Is there a gender predilection?
No

EMA

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Q

Spontaneous Hyphema

Who is the typical FHI pt?
A middle-aged adult

Is there a gender predilection?
No

What exam findings comprise the 'classic triad' of FHI? (Hyphema is not one of them.)

EMA

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A

Spontaneous Hyphema

Who is the typical FHI pt?
A middle-aged adult

Is there a gender predilection?
No

What exam findings comprise the 'classic triad' of FHI? (Hyphema is not one of them.)
Heterochromia iridis, cataract, and stellate KP

EMA

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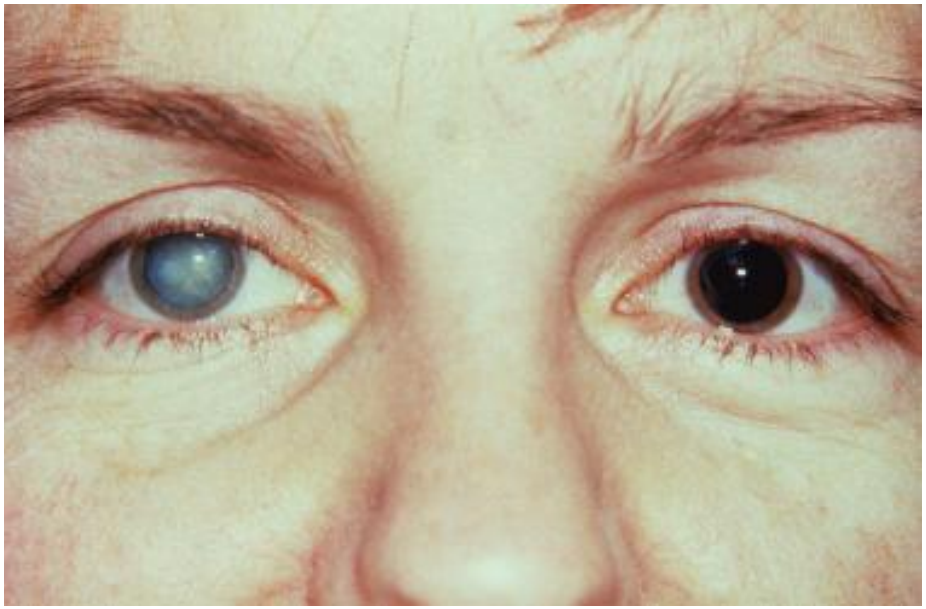
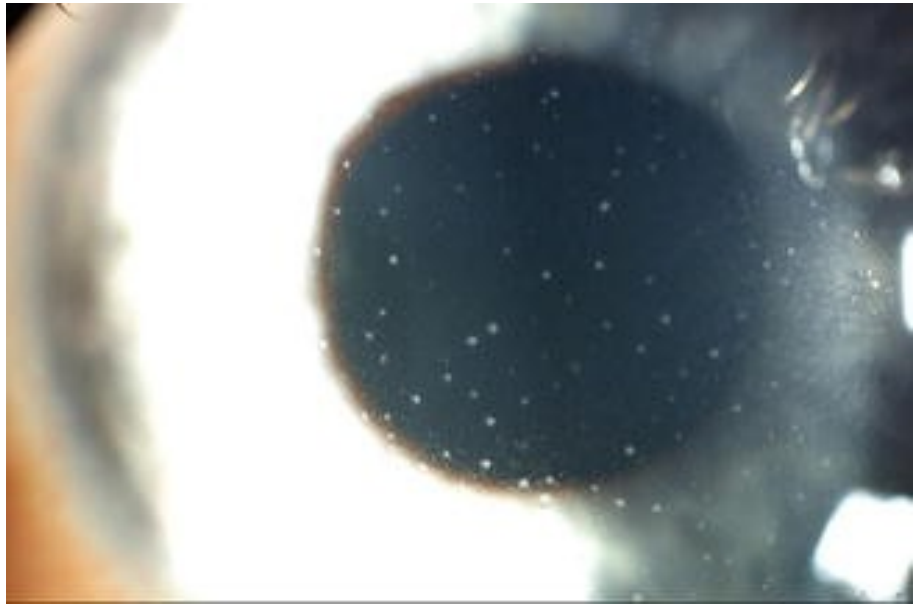
Spontaneous Hyphema





FHI: Heterochromia iridis, cataract, and stellate KP

Q

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Is there a gender predilection?
No

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EMA

*Is the affected eye the **darker** eye, or the **lighter** eye?*

--Herpetic uveitides

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A

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Is there a gender predilection?
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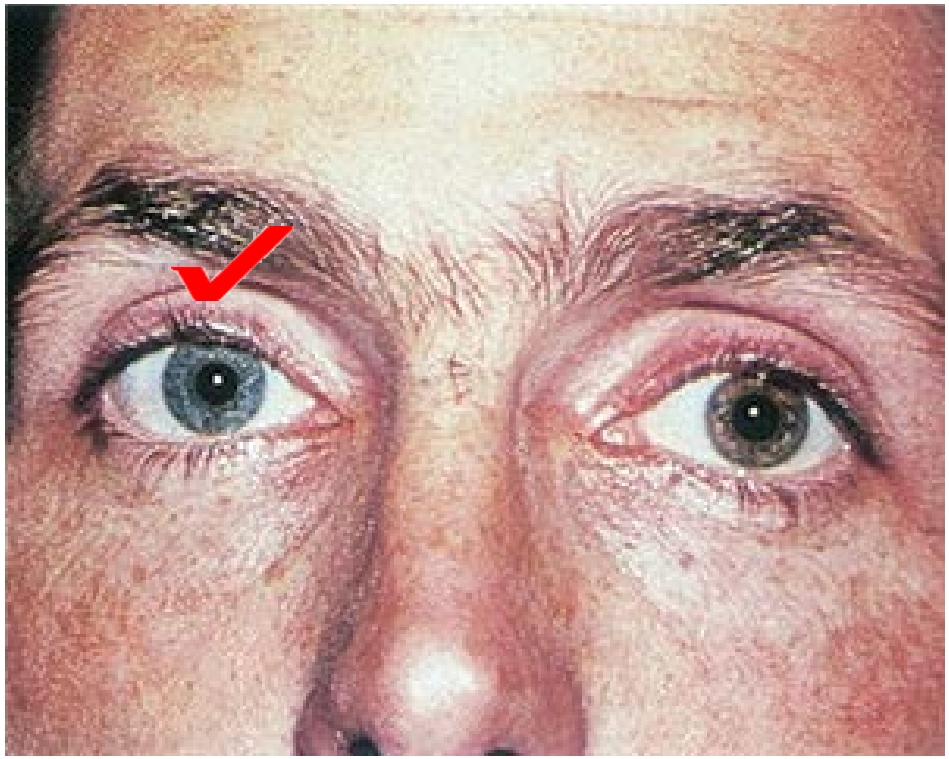
Heterochromia iridis, cataract, and stellate KP

*Is the affected eye the **darker** eye, or the **lighter** eye?*
The lighter (most of the time; see *U13* for details)

--Herpetic uveitides

--**Fuch heterochromic iridocyclitis (FHI)**

Spontaneous Hyphema



FHI

Q

Spontaneous Hyphema

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Is there a gender predilection?
No

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What other ophthalmic issue is common in FHI? (Again, hyphema ain't it.)

EMA

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Glaucoma—it develops in about 25-50% of cases

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Q

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What is the etiology of FHI?

EMA

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Q/A

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Glaucoma—it develops in about 25-50% of cases

What is the etiology of FHI?
It is uncertain at this time. Four infectious entities have been suggested:
--***?***
--***?***
--***?***
--***?***

--Herpetic uveitides
--**Fuch heterochromic iridocyclitis (FHI)**

A

Spontaneous Hyphema

Who is the typical FHI pt?
A middle-aged adult

Is there a gender predilection?
No

What exam findings comprise the 'classic triad' of FHI? (Hyphema is not one of them.)
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--HSV
--CMV
--Rubella

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--Rubella?
As of now, the preponderance of the evidence points to [redacted], but it remains unproven.

--Herpetic uveitides

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EMA

How well does FHI respond to steroid therapy?

oven.

--Herpetic uveitides

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How well does FHI respond to steroid therapy?
Poorly--AC cell is notoriously difficult to eradicate in FHI (as is the anterior vitreous cell which frequently occurs)

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How well does FHI respond to steroid therapy?
Poorly--AC cell is notoriously difficult to eradicate in FHI (as is the anterior vitreous cell which frequently occurs)

If/when the inflammation fails to respond to topical steroids, should more aggressive therapies be pursued?

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What other ophthalmic issue is common in FHI? (Again, hyphema ain't it.)

How well does FHI respond to steroid therapy?
Poorly--AC cell is notoriously difficult to eradicate in FHI (as is the anterior vitreous cell which frequently occurs)

If/when the inflammation fails to respond to topical steroids, should more aggressive therapies be pursued?
Generally no. In fact, most pts require no anti-inflammatory tx of any sort (including steroids). Instead, the pt should be monitored for the development of glaucoma and cataract.

--Herpetic uveitides

--**Fuch heterochromic iridocyclitis (FHI)**

Q

Spontaneous Hyphema

- Adults
  - Ischemia
  - Neoplasm
  - Inflammation
- Children
  - ?
  - ?
  - ?

What three conditions are most commonly associated with spontaneous hyphema in children?

A

Spontaneous Hyphema

- Adults
  - Ischemia
  - Neoplasm
  - Inflammation
- Children
  - JXG
  - Rb
  - Leukemia

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What does JXG stand for?

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Spontaneous Hyphema

- Adults
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  - **JXG**
  - Ph

What does JXG stand for?
Juvenile xanthogranuloma

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What does JXG stand for?
Juvenile xanthogranuloma

In three words, what sort of condition is it?
It is a

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What does JXG stand for?
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In three words, what sort of condition is it?
It is a **nonneoplastic histiocytic proliferation**

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At what age does JXG present?

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At what age does JXG present?
The majority before age 1 year, and almost all by age 2

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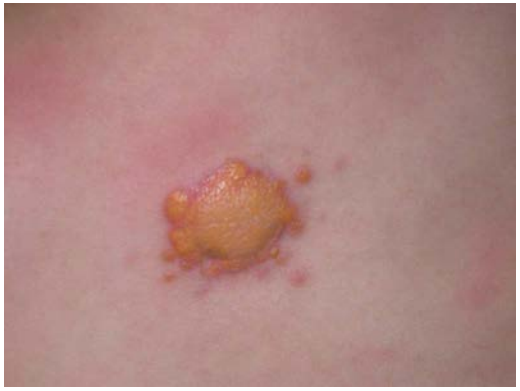
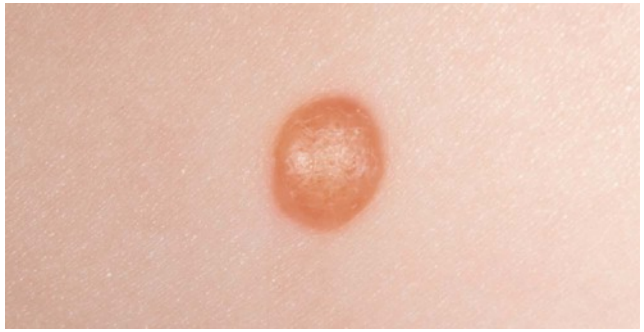
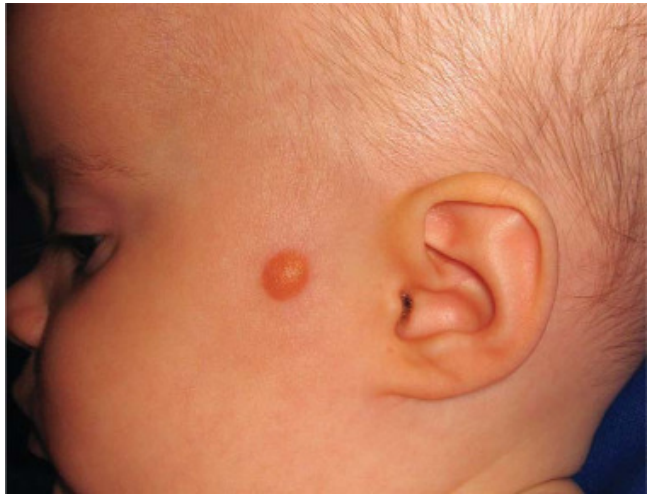
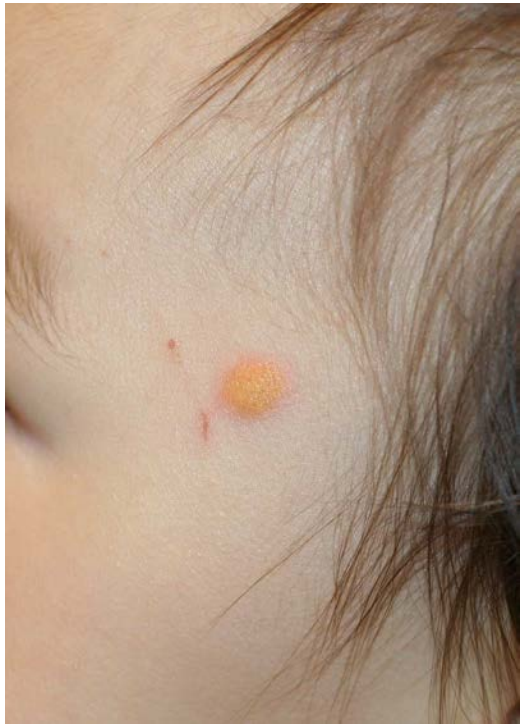
How does JXG usually present? (Hint: It's not ophthalmic)
As skin papules









JXG: Skin papules. The orangish color is classic

Q

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- Adults
  - Ischemia
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When **iris** *JXG nodules are present, is it uni-, or bilaterally?*

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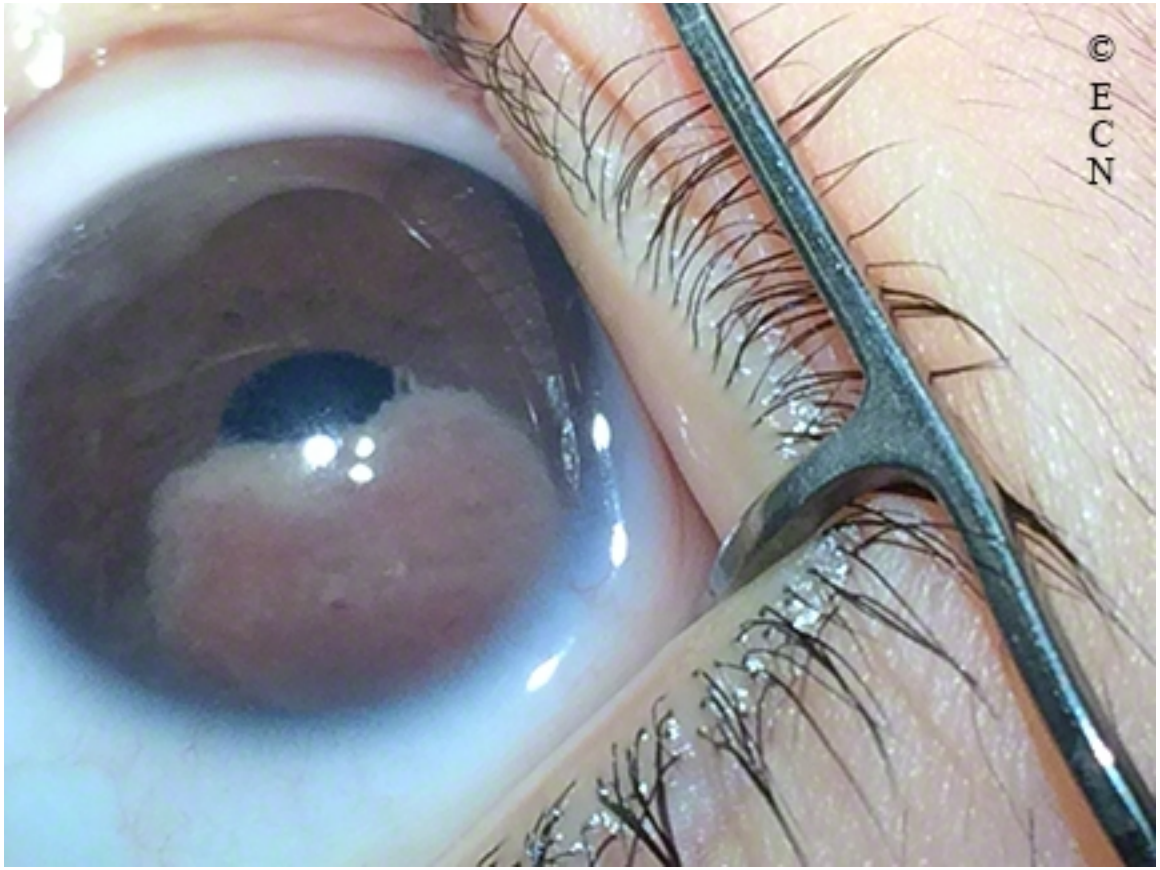
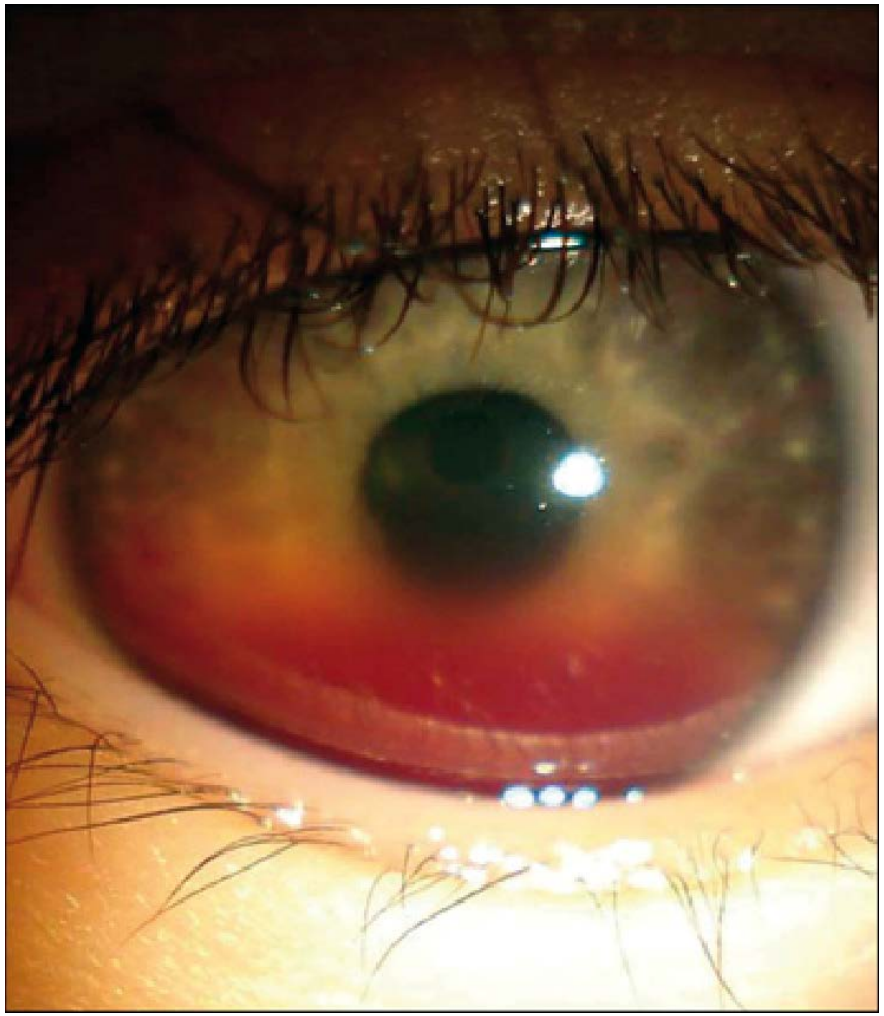


JXG: Iris lesion



JXG: Spontaneous hyphema

Q

Spontaneous Hyphema

- Adults
  - Ischemia
  - Neoplasm
  - Infla
- Children
  - **JXG**
    - Ph

What does JXG stand for?

In addition to spontaneous hyphema, in what three ways are JXG iris nodules clinically significant?

--

--

--

2

lmic)

When **iris** *JXG nodules are present, is it uni-, or bilaterally?*

Unilaterally

A

Spontaneous Hyphema

- Adults
  - Ischemia
  - Neoplasm
  - Infla
- Children
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    - Ph

What does JXG stand for?

In addition to spontaneous hyphema, in what three ways are JXG iris nodules clinically significant?
--They are in the DDx as a 'masquerade syndrome' in peds uveitis
--If enough are present, they will cause heterochromia iridis
--They can result in severe glaucoma

2

lmic)

When **Iris** *JXG nodules are present, is it uni-, or bilaterally?*
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Should they be removed surgically?

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Should they be removed surgically?
Only if the glaucoma is uncontrollable

2

lmic)

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What is the natural history of the disease?

2

lmic)

When **Iris** *JXG nodules are present, is it uni-, or bilaterally?*
Unilaterally

Q/A

Spontaneous Hyphema

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Should they be removed surgically?
Only if the glaucoma is uncontrollable

What is the natural history of the disease?
JXG is self-limited, usually resolving by age

When **iris** *JXG nodules are present, is it uni-, or bilaterally?*
Unilaterally

A

Spontaneous Hyphema

- Adults
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  - Infla
- Children
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--They can result in severe glaucoma

Should they be removed surgically?
Only if the glaucoma is uncontrollable

What is the natural history of the disease?
JXG is self-limited, usually resolving by age 5 years

2

lmic)

When **Iris** *JXG nodules are present, is it uni-, or bilaterally?*
Unilaterally

Q

Spontaneous Hyphema

- Adults
  - Ischemia
  - Neoplasm
  - Inflammation
- Children
  - JXG
  - **Rb**
  - Leukemia

What does Rb *stand for in this context?*

A

Spontaneous Hyphema

- Adults
  - Ischemia
  - Neoplasm
  - Inflammation
- Children
  - JXG
  - **Rb**
  - Leukemia

What does Rb *stand for in this context?*

Retinoblastoma

Q

Spontaneous Hyphema

- Adults
  - Ischemia
  - Neoplasm
  - Inflammation
- Children
  - JXG
  - **Rb**
  - Leukemia

What does Rb *stand for in this context?*
Retinoblastoma

The BCSC *doesn't have too much to say about hyphema in Rb, save the following two points:*
--It is *[common vs uncommon]*

A

Spontaneous Hyphema

- Adults
  - Ischemia
  - Neoplasm
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What does Rb *stand for in this context?*
Retinoblastoma

The BCSC *doesn't have too much to say about hyphema in Rb, save the following two points:*
--It is uncommon
--It is more likely to occur in children [> or <] than 5 years of age

A

Spontaneous Hyphema

- Adults
  - Ischemia
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  - Inflammation
- Children
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What does Rb *stand for in this context?*
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The BCSC *doesn't have too much to say about hyphema in Rb, save the following two points:*
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For more on Rb, see slide-set R2

Q

Spontaneous Hyphema

- Adults
  - Ischemia
  - Neoplasm
  - Inflammation
- Children
  - JXG
  - Rb
  - **Leukemia**

Where does leukemia rank among childhood malignancies in terms of incidence?

A

Spontaneous Hyphema

- Adults
  - Ischemia
  - Neoplasm
  - Inflammation
- Children
  - JXG
  - Rb
  - **Leukemia**

Where does leukemia rank among childhood malignancies in terms of incidence?

It is #1 by a mile

Q

Spontaneous Hyphema

- Adults
  - Ischemia
  - Neoplasm
  - Inflammation
- Children
  - JXG
  - Rb
  - **Leukemia**

Where does leukemia rank among childhood malignancies in terms of incidence?
It is #1 by a mile

Re its histology: Which form of leukemia is most common in children?

A

Spontaneous Hyphema

- Adults
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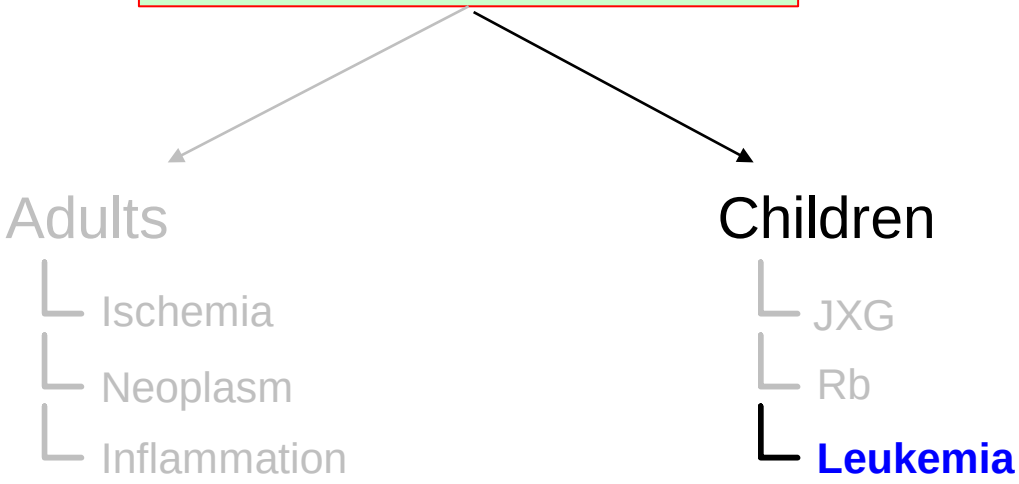
Where does leukemia rank among childhood malignancies in terms of incidence?
It is #1 by a mile

Re its histology: Which form of leukemia is most common in children?
Acute lymphocytic (ALL)

Q

Spontaneous Hyphema



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What other anterior-chamber condition is a well-known manifestation of leukemia?

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For more on ophthalmic manifestations of pediatric leukemia, see slide-set P20