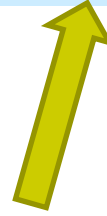
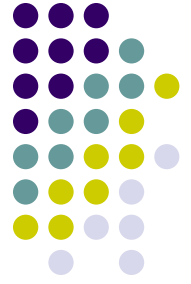


HTNive *Oculopathy*



I coined the term *oculopathy* because, for reasons that will soon be apparent, a term broader in scope than 'HTNive retinopathy' was needed, Stay tuned.



Q

HTNive Oculopathy

1) Hypertensive

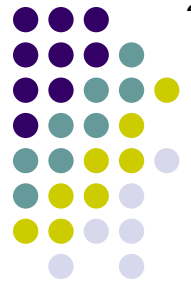
category of 'oculopathy'

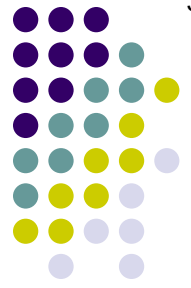
2) Hypertensive

category of 'oculopathy'

3) Hypertensive

category of 'oculopathy'





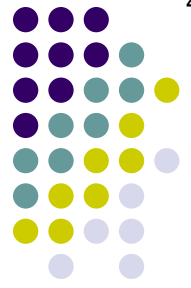
A

HTNive Oculopathy

1) Hypertensive *retinopathy*

2) Hypertensive *choroidopathy*

3) Hypertensive *optic neuropathy*



Q

HTNive Oculopathy

1) Hypertensive *retinopathy*

- Most common sign in chronic HTN:

two words

2) Hypertensive *choroidopathy*

3) Hypertensive *optic neuropathy*



A

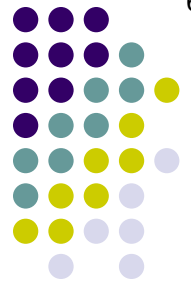
HTNive Oculopathy

1) Hypertensive *retinopathy*

- Most common sign in chronic HTN: *arteriolar constriction*

2) Hypertensive *choroidopathy*

3) Hypertensive *optic neuropathy*



Q

HTNive Oculopathy

1) Hypertensive *retinopathy*

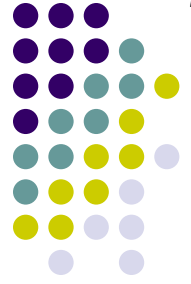
- Most common sign in chronic HTN: *arteriolar constriction*

2) Hypertensive *choroidopathy*

- Occurs typically in young patients with acute HTN:

●	common cause of acute HTN in young female
●	rare cause of acute HTN in young person
●	not rare cause of acute HTN in young person

3) Hypertensive *optic neuropathy*



A

HTNive Oculopathy

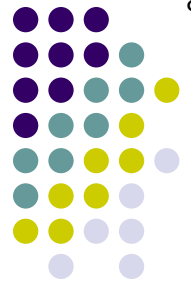
1) Hypertensive *retinopathy*

- Most common sign in chronic HTN: *arteriolar constriction*

2) Hypertensive *choroidopathy*

- Occurs typically in young patients with acute HTN:
 - *Preeclampsia/eclampsia*
 - *Pheochromocytoma*
 - *Renal disease*

3) Hypertensive *optic neuropathy*



Q

HTNive Oculopathy

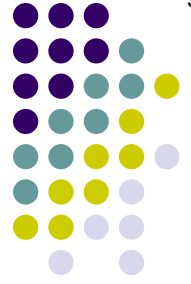
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2) Hypertensive *choroidopathy*

- Occurs typically in young patients with acute HTN:
 - Preeclampsia/eclampsia
 - Pheochromocytoma
 - Renal disease
- Signs:
 - Hyperpigmented spots with hypopigmented rim = eponymous name of lesions

3) Hypertensive *optic neuropathy*



A

HTNive Oculopathy

1) Hypertensive *retinopathy*

- Most common sign in chronic HTN: *arteriolar constriction*

2) Hypertensive *choroidopathy*

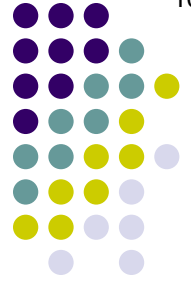
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- *Renal disease*

- Signs:

- Hyperpigmented spots with hypopigmented rim = *Elschnig spots*

3) Hypertensive *optic neuropathy*



Q

HTNive Oculopathy

1) Hypertensive *retinopathy*

- Most common sign in chronic HTN: *arteriolar constriction*

2) Hypertensive *choroidopathy*

- Occurs typically in young patients with acute HTN:

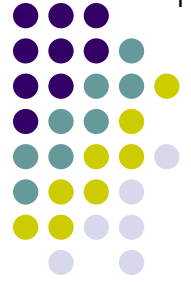
- *Preeclampsia/eclampsia*
- *Pheochromocytoma*
- *Renal disease*

- Signs:

- Hyperpigmented spots with hypopigmented rim = *Elschnig spots*
- Linear areas of hyperpigmentation overlying choroidal arteries =

eponymous name of lesions

3) Hypertensive *optic neuropathy*



A

HTNive Oculopathy

1) Hypertensive *retinopathy*

- Most common sign in chronic HTN: *arteriolar constriction*

2) Hypertensive *choroidopathy*

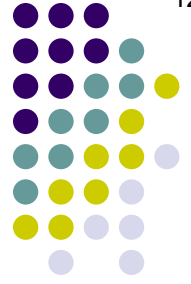
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- Signs:

- Hyperpigmented spots with hypopigmented rim = *Elschnig spots*
- Linear areas of hyperpigmentation overlying choroidal arteries = *Siegrist streaks*

3) Hypertensive *optic neuropathy*



Q

HTNive Oculopathy

1) Hypertensive *retinopathy*

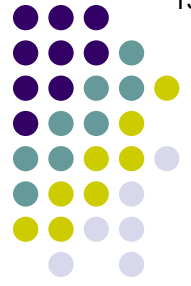
- Most common sign in chronic HTN: *arteriolar constriction*

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3) Hypertensive *optic neuropathy*

- Presentation depends upon and of HTN



A

HTNive Oculopathy

1) Hypertensive *retinopathy*

- Most common sign in chronic HTN: *arteriolar constriction*

2) Hypertensive *choroidopathy*

- Occurs typically in young patients with acute HTN:

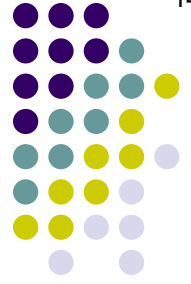
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- Signs:

- Hyperpigmented spots with hypopigmented rim = *Elschnig spots*
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3) Hypertensive *optic neuropathy*

- Presentation depends upon *degree* and *chronicity* of HTN



Q

HTNive Oculopathy

1) Hypertensive *retinopathy*

- Most common sign in chronic HTN: *arteriolar constriction*

2) Hypertensive *choroidopathy*

- Occurs typically in young patients with acute HTN:

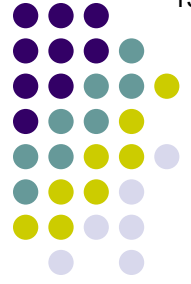
- *Preeclampsia/eclampsia*
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- Signs:

- Hyperpigmented spots with hypopigmented rim = *Elschnig spots*
- Linear areas of hyperpigmentation overlying choroidal arteries = *Siegrist streaks*

3) Hypertensive *optic neuropathy*

- Presentation depends upon *degree* and *chronicity* of HTN
- Severe HTN → sign (two words) at disc margin + disc



A

HTNive Oculopathy

1) Hypertensive *retinopathy*

- Most common sign in chronic HTN: *arteriolar constriction*

2) Hypertensive *choroidopathy*

- Occurs typically in young patients with acute HTN:
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- Signs:
 - Hyperpigmented spots with hypopigmented rim = *Elschnig spots*
 - Linear areas of hyperpigmentation overlying choroidal arteries = *Siegrist streaks*

3) Hypertensive *optic neuropathy*

- Presentation depends upon *degree* and *chronicity* of HTN
- Severe HTN → *flame hemorrhages* at disc margin + disc *edema*

HTNive Oculopathy



*Next we will look at the same topic
but from a different perspective....*

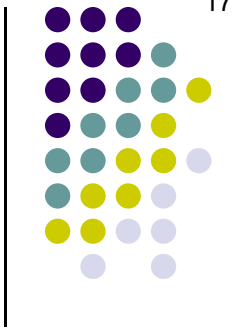
Q

HTNive Oculopathy

A non-anatomic way to think about HTN and the eye

?

?



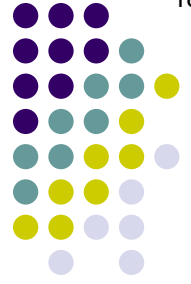
A

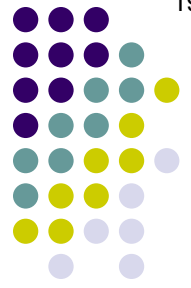
HTNive Oculopathy

A non-anatomic way to think about HTN and the eye

Chronic

Acute





Q

HTNive Oculopathy

Chronic

Acute

*What process mediates damage caused by **chronic** HTN?*

?

A

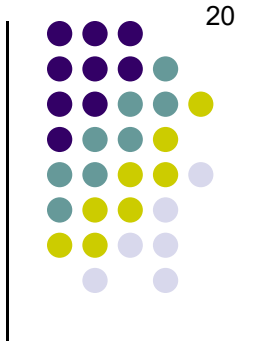
HTNive Oculopathy

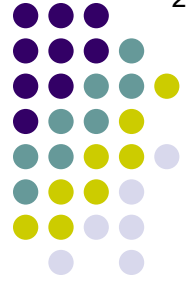
Chronic

Acute

*What process mediates damage caused by **chronic** HTN?*

Arteriosclerosis





Q

HTNive Oculopathy

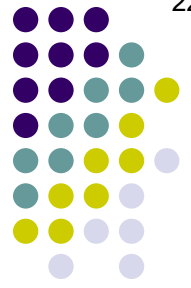
Chronic

Acute

What process mediates damage caused by chronic HTN?

Arteriosclerosis

Briefly, what is the pathophysiology of arteriosclerosis?



Q/A

HTNive Oculopathy

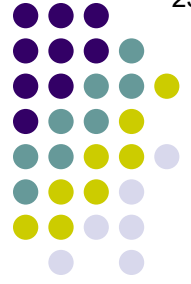
Chronic

Acute

What process mediates damage caused by chronic HTN?

Arteriosclerosis

Briefly, what is the pathophysiology of arteriosclerosis?
Chronic HTN leads to **cell-type** damage in the retinal arteriole bed.



A

HTNive Oculopathy

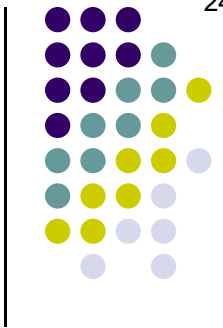
Chronic

Acute

What process mediates damage caused by chronic HTN?

Arteriosclerosis

Briefly, what is the pathophysiology of arteriosclerosis?
Chronic HTN leads to endothelial-cell damage in the retinal arteriole bed.



HTNive Oculopathy

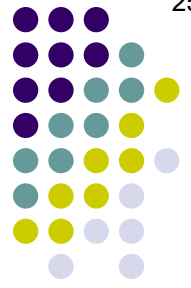
Chronic

Acute

What process mediates damage caused by chronic HTN?

Arteriosclerosis

Briefly, what is the pathophysiology of arteriosclerosis?
Chronic HTN leads to endothelial-cell damage in the retinal arteriole bed. Endothelial damage allows plasma to leach into the vessel wall, where it clots. Clotting within the wall leads to 'stiffening' of the vessel, as well as to narrowing of its lumen.



Q

HTNive Oculopathy

Chronic

Acute

*What process mediates damage caused by **chronic** HTN?*

Arteriosclerosis

What pathology typically results?

?



A

HTNive Oculopathy

Chronic

Acute

*What process mediates damage caused by **chronic** HTN?*

Arteriosclerosis

What pathology typically results?

Retinopathy



Q

HTNive Oculopathy

Chronic

Acute

What process mediates damage caused by chronic HTN?

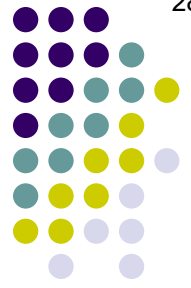
Arteriosclerosis

What pathology typically results?

Retinopathy

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Chronic HTN leads to endothelial-cell damage in the retinal arteriole bed. Endothelial damage allows plasma to leach into the vessel wall, where it clots. Clotting within the wall leads to 'stiffening' of the vessel, as well as to narrowing of its lumen.

How does arteriosclerosis lead to retinopathy?



A

HTNive Oculopathy

Chronic

Acute

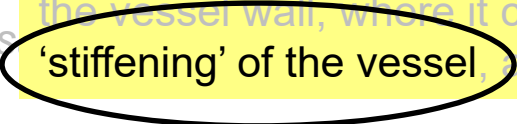
What process mediates damage caused by chronic HTN?

Arteriosclerosis

What pathology typically results?

Retinopathy

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How does arteriosclerosis lead to retinopathy?
'Stiff' vessels are prone to breaking/leaking, and...



A

HTNive Oculopathy

Chronic

Acute

*What process mediates damage caused by **chronic HTN**?*

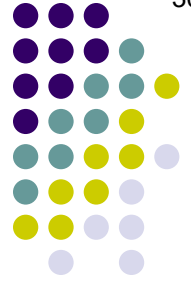
Arteriosclerosis

What pathology typically results?

Retinopathy

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Chronic HTN leads to endothelial-cell damage in the retinal arteriole bed. Endothelial damage allows plasma to leach into the vessel wall, where it clots. Clotting within the wall leads to 'stiffening' of the vessel, as well as to **narrowing of its lumen.**

How does arteriosclerosis lead to retinopathy?
'Stiff' vessels are prone to breaking/leaking, and... narrowed vessel lumens lead to nonperfusion in the tissue bed



Q

HTNive Oculopathy

Chronic

Acute

*What process mediates damage caused by **chronic** HTN?*

Arteriosclerosis

What pathology typically results?

Retinopathy

?

?

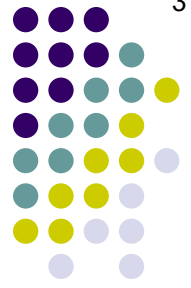
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What are the common manifestations of HTNive retinopathy?



A

HTNive Oculopathy

Chronic

Acute

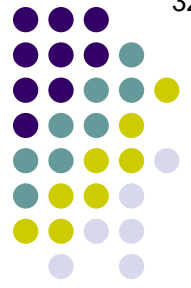
*What process mediates damage caused by **chronic** HTN?*

Arteriosclerosis

What pathology typically results?

Retinopathy

- Arteriolar narrowing
 - Retinal hemorrhages
 - Microaneurysms
 - A-V nicking
 - Cotton-wool spots
 - Neovascularization
- What are the common manifestations of HTNive retinopathy?*



Q

HTNive Oculopathy

Chronic

Acute

*What process mediates damage caused by **chronic** HTN?*

*What process mediates damage caused by **acute** HTN?*

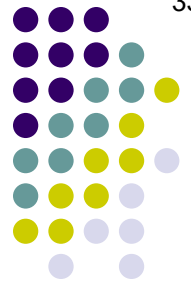
Arteriosclerosis

?

What pathology typically results?

Retinopathy

- Arteriolar narrowing
- Retinal hemorrhages
- Microaneurysms
- A-V nicking
- Cotton-wool spots
- Neovascularization



A

HTNive Oculopathy

Chronic

Acute

*What process mediates damage caused by **chronic** HTN?*

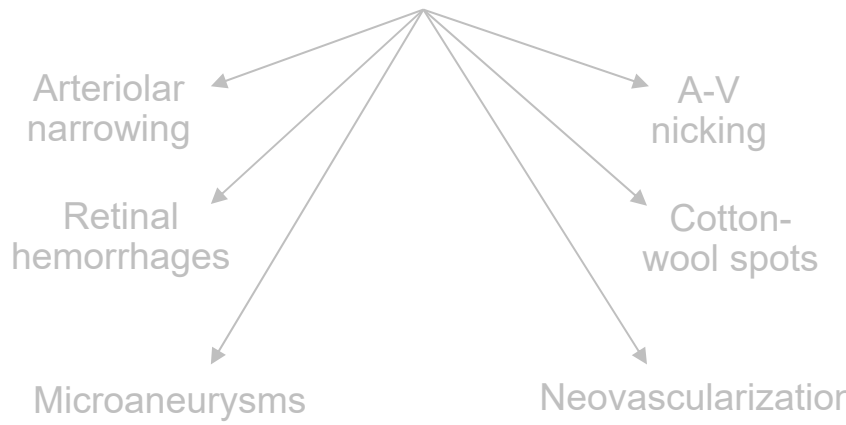
*What process mediates damage caused by **acute** HTN?*

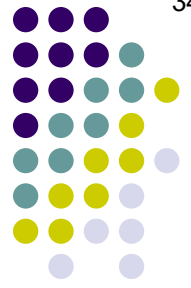
Arteriosclerosis

Vasospasm

What pathology typically results?

Retinopathy





Q

HTNive Oculopathy

Chronic

Acute

*What process mediates damage caused by **chronic** HTN?*

*What process mediates damage caused by **acute** HTN?*

Arteriosclerosis

Vasospasm

What pathology typically results?

What pathologies (2) typically result?

Retinopathy

? & ?

- Arteriolar narrowing
- Retinal hemorrhages
- Microaneurysms
- A-V nicking
- Cotton-wool spots
- Neovascularization



A

HTNive Oculopathy

Chronic

Acute

*What process mediates damage caused by **chronic** HTN?*

*What process mediates damage caused by **acute** HTN?*

Arteriosclerosis

Vasospasm

What pathology typically results?

What pathologies (2) typically result?

Retinopathy

Choroidopathy & Optic Neuropathy

- Arteriolar narrowing
- Retinal hemorrhages
- Microaneurysms
- A-V nicking
- Cotton-wool spots
- Neovascularization



Q

HTNive Oculopathy

Chronic

Acute

What process mediates damage caused by **chronic** HTN?

What process mediates damage caused by **acute** HTN?

Arteriosclerosis

Vasospasm

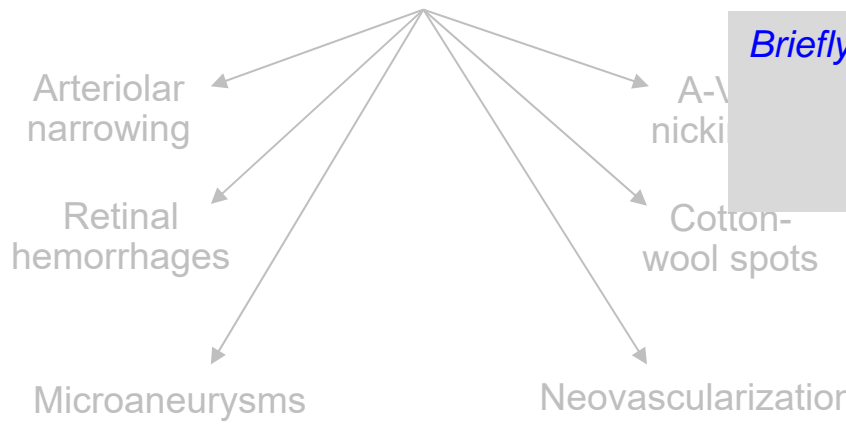
What pathology typically results?

What pathologies (2) typically result?

Retinopathy

Choroidopathy & Optic Neuropathy

Briefly, what is the pathophysiology of HTNive choroidopathy?





Q/A

HTNive Oculopathy

Chronic

Acute

What process mediates damage caused by **chronic** HTN?

What process mediates damage caused by **acute** HTN?

Arteriosclerosis

Vasospasm

What pathology typically results?

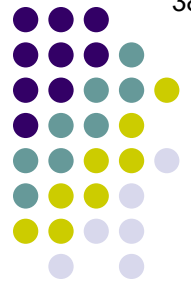
What pathologies (2) typically result?

Retinopathy

Choroidopathy & Optic Neuropathy

- Arteriolar narrowing
- Retinal hemorrhages
- Microaneurysms
- A-V nicking
- Cotton-wool spots
- Neovascularization

Briefly, what is the pathophysiology of HTNive choroidopathy?
 Vasospasm leads to two words of the choriocapillaris.



A

HTNive Oculopathy

Chronic

Acute

*What process mediates damage caused by **chronic** HTN?*

*What process mediates damage caused by **acute** HTN?*

Arteriosclerosis

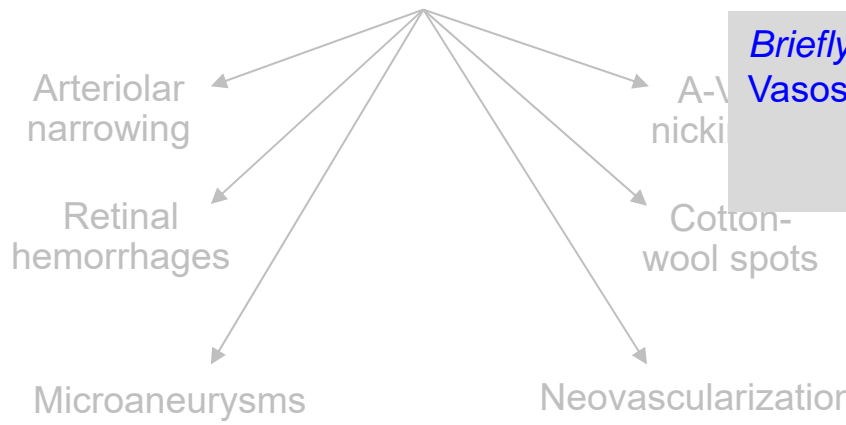
Vasospasm

What pathology typically results?

What pathologies (2) typically result?

Retinopathy

Choroidopathy & Optic Neuropathy



*Briefly, what is the pathophysiology of HTNive choroidopathy?
Vasospasm leads to lobular nonperfusion of the choriocapillaris.*



A

HTNive Oculopathy

Chronic

Acute

*What process mediates damage caused by **chronic** HTN?*

*What process mediates damage caused by **acute** HTN?*

Arteriosclerosis

Vasospasm

What pathology typically results?

What pathologies (2) typically result?

Retinopathy

Choroidopathy & Optic Neuropathy

Arteriolar narrowing

A-V nicking

Retinal hemorrhages

Cotton-wool spots

Microaneurysms

Neovascularization

Briefly, what is the pathophysiology of HTNive choroidopathy?
Vasospasm leads to lobular nonperfusion of the choriocapillaris. Acutely, these nonperfused lobulations (spots) are hypopigmented; but with time they become hyperpigmented.



Q

HTNive Oculopathy

Chronic

Acute

What process mediates damage caused by **chronic** HTN?

What process mediates damage caused by **acute** HTN?

Arteriosclerosis

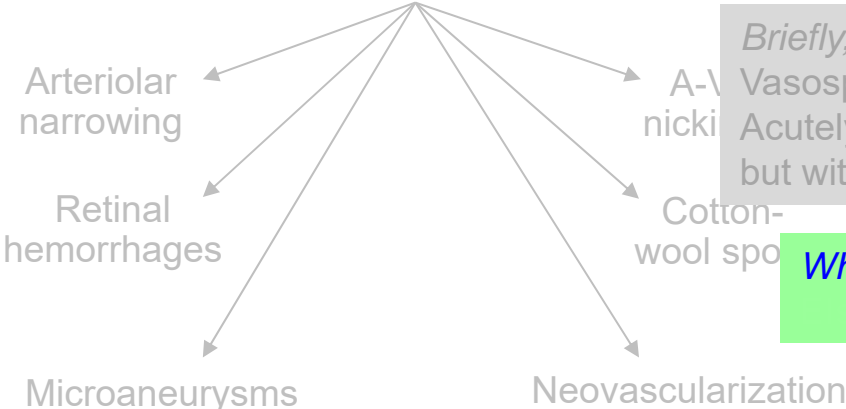
Vasospasm

What pathology typically results?

What pathologies (2) typically result?

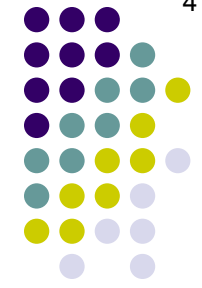
Retinopathy

Choroidopathy & Optic Neuropathy



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 Vasospasm leads to lobular nonperfusion of the choriocapillaris. Acutely, these nonperfused lobulations (spots) are hypopigmented; but with time they become **hyperpigmented**.

What is the eponymous name of these hyperpigmented spots?



Q/A

HTNive Oculopathy

Chronic

Acute

What process mediates damage caused by **chronic** HTN?

What process mediates damage caused by **acute** HTN?

Arteriosclerosis

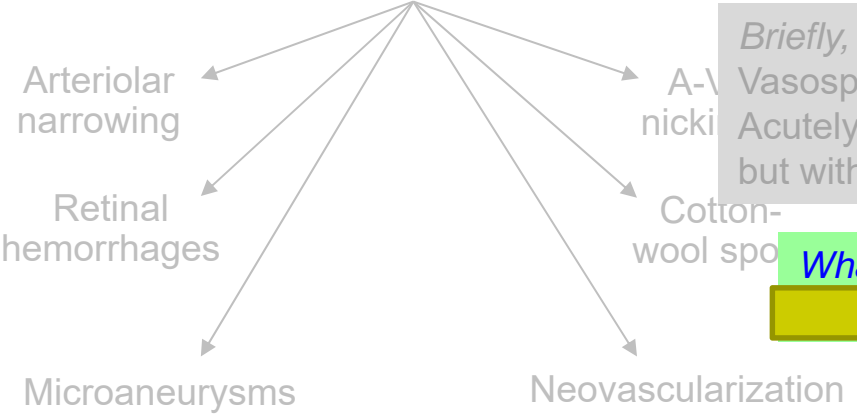
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What pathologies (2) typically result?

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Choroidopathy & Optic Neuropathy



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 Vasospasm leads to lobular nonperfusion of the choriocapillaris. Acutely, these nonperfused lobulations (spots) are hypopigmented; but with time they become **hyperpigmented**.

What is the eponymous name of these hyperpigmented spots?
Keith-Jones spots



A

HTNive Oculopathy

Chronic

Acute

What process mediates damage caused by **chronic** HTN?

What process mediates damage caused by **acute** HTN?

Arteriosclerosis

Vasospasm

What pathology typically results?

What pathologies (2) typically result?

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Choroidopathy & Optic Neuropathy

Arteriolar narrowing

A-V nicking

Retinal hemorrhages

Cotton-wool spots

Microaneurysms

Neovascularization

Briefly, what is the pathophysiology of HTNive choroidopathy?
Vasospasm leads to lobular nonperfusion of the choriocapillaris. Acutely, these nonperfused lobulations (spots) are hypopigmented; but with time they become **hyperpigmented**.

What is the eponymous name of these hyperpigmented spots?
Elschnig spots



Q

HTNive Oculopathy

Chronic

Acute

What process mediates damage caused by **chronic** HTN?

What process mediates damage caused by **acute** HTN?

Arteriosclerosis

Vasospasm

What pathology typically results?

What pathologies (2) typically result?

Retinopathy

Choroidopathy & Optic Neuropathy

HTNive choroidopathy is associated with another hyperpigmented lesion, but one with a linear rather than lobular shape. What is its eponymous name?

*Pathophysiology of HTNive choroidopathy? Lobular nonperfusion of the choriocapillaris. Hypopigmented lobulations (spots) are hypopigmented; some **hyperpigmented**.*

Arteriolar narrowing

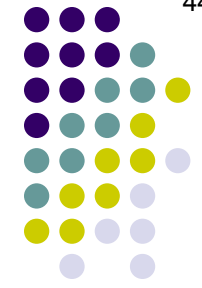
Retinal hemorrhages

Microaneurysms

Cotton-wool spots

Neovascularization

What is the eponymous name of these hyperpigmented spots?
Elschnig spots



Q/A

HTNive Oculopathy

Chronic

Acute

What process mediates damage caused by **chronic** HTN?

What process mediates damage caused by **acute** HTN?

Arteriosclerosis

Vasospasm

What pathology typically results?

What pathologies (2) typically result?

Retinopathy

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HTNive choroidopathy is classically associated with four conditions— what are they?

-
-
-
-

HTNive hyperpigmented spots

Arteriolar narrowing

Retinal hemorrhages

Microaneurysms

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Elschnig spots

Choroidopathy? pericytic capillaris. hypopigmented; pigmented spots?



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HTNive hyperpigmentation than lobulated

HTNive choroidopathy is classically associated with four conditions— what are they?

- Pre-eclampsia
- Eclampsia
- Pheochromocytoma
- Acute renal failure

Elschnig spots

Choroidopathy?

capillaris.

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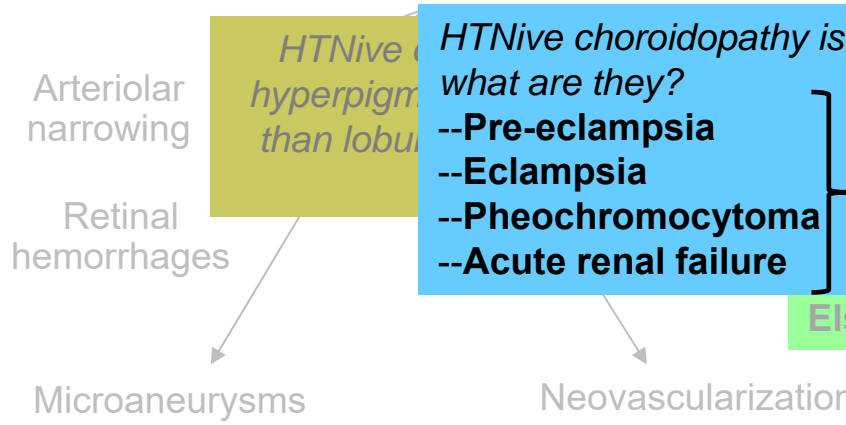
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Choroidopathy & Optic Neuropathy



HTNive hyperpigmentation than lobules

HTNive choroidopathy is what are they?

- Pre-eclampsia
- Eclampsia
- Pheochromocytoma
- Acute renal failure

All four are associated with another, as-yet-unmentioned manifestation of severe HTNive choroidopathy. What is it?



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Exudative retinal detachment (ERD)



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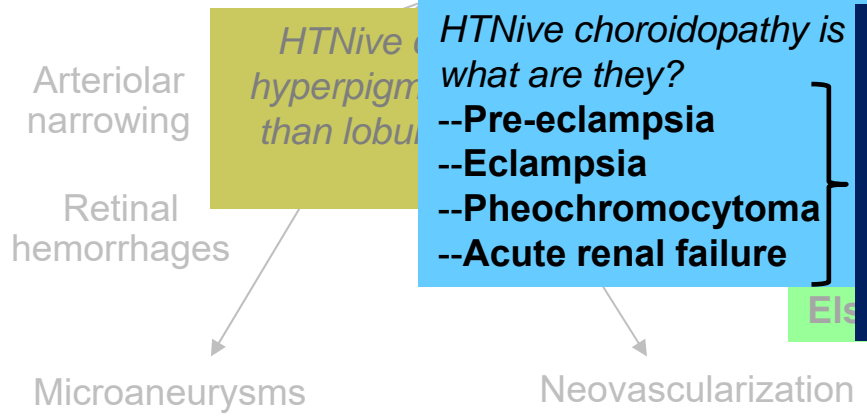
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What are the two most common causes of ERD? (HTNive choroidopathy ain't one of them.)



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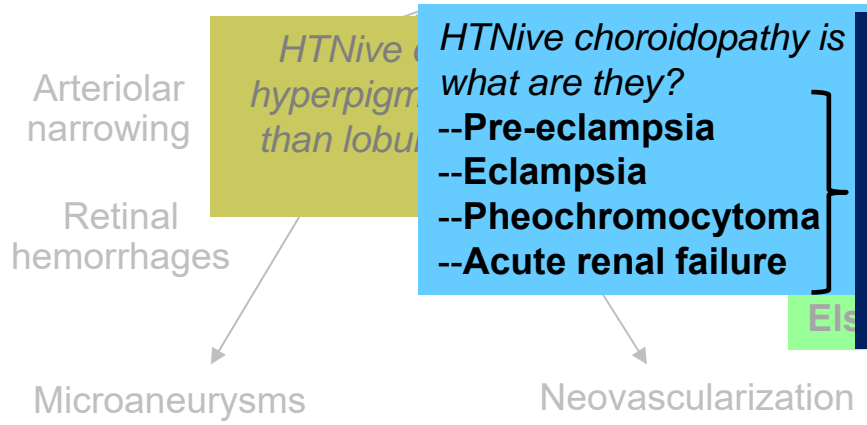
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All four are associated with another, as-yet-unmentioned manifestation of severe HTNive choroidopathy. What is it? Exudative retinal detachment (ERD)

What are the two most common causes of ERD? (HTNive choroidopathy ain't one of them.) Neoplasia (often metastatic), and inflammatory processes



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- Arteriolar narrowing
- Retinal hemorrhages
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- Neovascularization
- A-nick
- Co wool

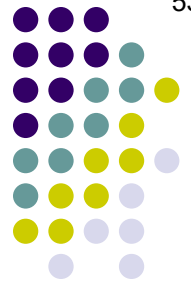
What are the ophthalmoscopic findings in HTNive optic neuropathy?

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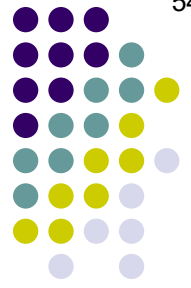
Microaneurysms

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What are the ophthalmoscopic findings in HTNive optic neuropathy?
--Peripapillary hemorrhages
--Blurring of the disc margin
--Disc edema
--Macular exudate (possibly in a 'star' configuration)



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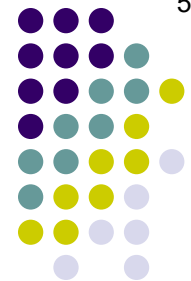
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What is the causative organism in CSD?

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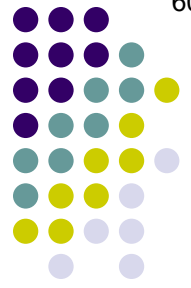
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What is the causative organism in CSD?
Bartonella henselae



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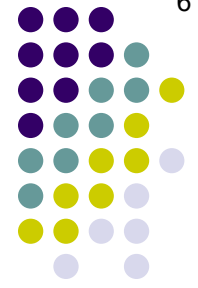
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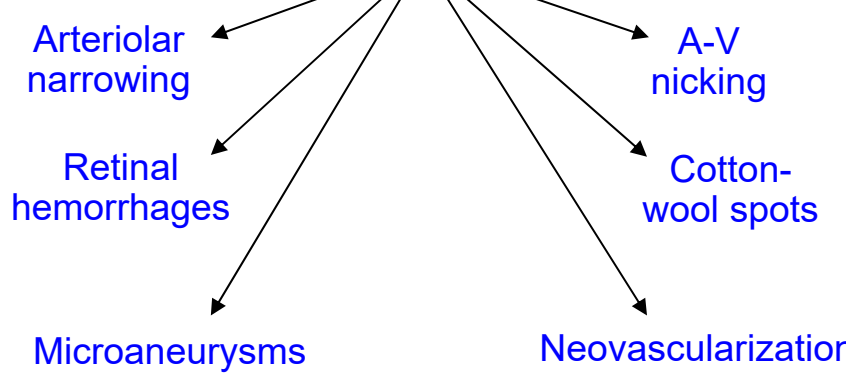
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HTN is a risk factor for several retinal vascular events that convey significant ocular morbidity—what are they?

- Retinal arterial occlusions (branch and central)
- Retinal venous occlusions (ditto)
- Retinal macroaneurysms