Ocular Sonography for the Emergency Department

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http://vimeo.com/31855562

Keep in Mind...

- Images accessible
- Serious pathology usually conspicuous
- No special equipment - try it out!

Outline

- Overview of Anatomy
- Scanning Technique
- Posterior Segment Pathology (PVD, RD, VH)
- Optic Disk Swelling
- Trauma Evaluation
- Conclusion
• How many have performed fundoscopy in last 6 months?

• How many have been satisfied with view?

You are not alone!

Sonography is helpful when...

• Contraindications to mydriatics

• Periorbital trauma

• Hyphema, cataracts, vitreous hemorrhage

• You are not an Ophthalmologist

Outside of ophthalmology office, fundoscopy performed in 3% - 14% of cases where indicated.
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Normal eye

Technique

Technique Pearls

• Scan in transverse and longitudinal planes
• Ask pt to move eye in all directions (lid closed)
• Adjust gain to bring out subtle findings
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62 M with floaters

• Acute onset of “dark spots” in L eye
• VA 20/60 OS, 20/40 OD, 20/40 OU
• Pupils, IOP, EOM, Visual Fields all normal
Dx: Posterior Vitreous Detachment

- Separation of the vitreous gel from the retinal surface
- Age-related “arthritis” of the eye (>60% by age 70)
- Benign, but can progress to retinal detachment (1/90)

PVD - Sonographic Findings

- Thin, faint, linear echodensity just above retina (may need high gain)
- Usually NOT attached to optic disk
- Significant movement/aftermovement (“swaying seaweed”) with eye motion

70 M with flashes and floaters

- Acute onset of “lights flashing” in peripheral vision L eye
- Hx of posterior vitreous detachment (asymptomatic)
- VA 20/60 OS, 20/40 OD, 20/40 OU
- L Temporal Field Cut
QuickTime™ and a VC Coding

Retinal Detachment - Sonographic Findings

• Thick, highly reflective echodensity (seen at normal gain)
• ALWAYS tethered to optic disk
• Undulating, “dancing” appearance, moves with eye
• Usually highly conspicuous, where PVD is not

Dx: Acute Retinal Detachment
PVD vs RD

<table>
<thead>
<tr>
<th>Feature</th>
<th>Posterior Vitreous Detachment</th>
<th>Retinal Detachment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Echogenicity</td>
<td>Low-medium</td>
<td>High</td>
</tr>
<tr>
<td>Change with gain (dB)</td>
<td>Disappears with low gain</td>
<td>Visible with low gain</td>
</tr>
<tr>
<td>Mobility</td>
<td>High</td>
<td>Low</td>
</tr>
<tr>
<td>Optic disc attachment</td>
<td>Present or absent</td>
<td>Always present</td>
</tr>
</tbody>
</table>

Sharma et al; Ultrasound Clinics 2008

Vitreous Hemorrhage may mimic RD

- “Smoke,” “Cobweb-like” floaters in visual field suggest VH
- Diffuse, low-to-medium echoes in vitreous; can organize and layer with time
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•34 F with 2 months of headache

• Told she had “cluster HA” after negative CT

• Returns with blurry vision...
Case Continued...

- LP OP = 55cm H20
- Dx: Pseudotumor Cerebri

Sonography vs OCT for Disk Swelling

Note: Normal Disks up to 0.6mm
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“The role of the Emergency Physician in patients with orbital trauma is to determine that visual acuity, extraocular movements, and the fundus are normal.”

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Thanks!

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