Endophthalmitis

- Posttraumatic
- Postoperative
- Endogenous
Endophthalmitis

- Posttraumatic
- Postoperative
- Endogenous

? ?
Endophthalmitis

- Posttraumatic
- Postoperative
  - Acute
  - Chronic
- Endogenous
(Posttraumatic and postoperative endophthalmitis are discussed in the slide-sets listed above. The remainder of this slide-set will address endogenous endophthalmitis)
Endogenous Endophthalmitis

Is endogenous endophthalmitis a common entity?
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No, it is quite rare, accounting for less than 10% of all cases of endophthalmitis
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What sorts of conditions are associated with impaired immune status?

- HIV/AIDS
- Chronic disease (e.g., DM; malignancy; sickle-cell disease; lupus)
- On immunosuppressive/modulatory medications (e.g., organ transplant patients)
- Chemotherapy patients
- Neonates
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Why are neonates on this list?
The immune system does not fully mature until an infant is at least 6 months old. Until it does, they are immunocompromised to a degree.
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-- Chronic and/or repeated breaching of the body’s outer barrier

*Virtually any invasive medical procedure could result in endogenous endophthalmitis, but the BCSC Uveitis book mentions three by name. What are they?*
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- ?
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--Bowel surgery
--Endoscopy
--Dental work
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Important examples of chronic and/or repeated breaching of the body’s outer barrier include:
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--Indwelling catheters
--IV drug use
--Intravenous access lines
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What is the mechanism of infection; ie, how do the organisms reach the interior of the globe?
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What is the mechanism of infection; ie, how do the organisms reach the interior of the globe?
The route is hematogenous, with subsequent breakdown of the blood-eye barrier
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The fact that the route is hematogenous suggests the organisms are traveling from a nidus elsewhere, ie, that the endophthalmitis is an ocular sequelae of an infection elsewhere. Is this usually the case?
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Which extraocular locations are frequently implicated as the source in endogenous endophthalmitis?
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Which extraocular locations are frequently implicated as the source in endogenous endophthalmitis?
--Lungs
--Bladder
--Liver
--Sinuses
--Skin
--CNS (ie, meningitis)
--Heart
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What if no nidus can be identified?
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What if no nidus can be identified?
Keep looking! Don’t rely on labs and/or imaging studies to find it; rather, take a more careful and detailed history and ROS, and perform a more thorough PE. (Remember the old maxim: ‘When all else fails, examine the pt.’) That lower-extremity pain might actually be osteomyelitis. That ‘common cold’ might actually be bacterial sinusitis.
The organisms causing endogenous endophthalmitis come from one of two groups. What are they?
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Which is more common, bacterial or fungal endogenous endophthalmitis?
Endogenous Endophthalmitis

Bacterial

Fungal

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Which is more common, bacterial or fungal endogenous endophthalmitis? Estimates vary, but it’s probably in the ballpark of 50:50
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If the identity of the organism is in question, how should the clinician proceed?
Endogenous Endophthalmitis

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Fungal

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By obtaining aqueous (and vitreous, if PPV is performed) samples for culture and stains
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Which three culture media should be employed?
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Which two stains should be used?
--Gram
--Giemsa
Endogenous Endophthalmitis

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Fungal

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Which is of greater utility—cultures, or stains?
Endogenous Endophthalmitis

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Fungal

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Endogenous Endophthalmitis

**Bacterial**

**Fungal**

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What about the potential nidus of infection?
Endogenous Endophthalmitis

Bacterial  Fungal

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What about the potential nidus of infection? The H&P should guide the obtaining of nonocular specimens for cultures and stains. If in doubt, blood, urine and sputum C&S should probably be checked. Imaging studies should be considered as well, with consideration given to percutaneous or even open biopsies as the clinical situation warrants.
How does endogenous bacterial endophthalmitis present?
Endogenous Endophthalmitis

How does endogenous bacterial endophthalmitis present?
With both systemic and ocular findings
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What systemic findings are common?
Endogenous Endophthalmitis

- Bacterial
- Fungal

*How does endogenous bacterial endophthalmitis present?*
With both systemic and ocular findings

*What systemic findings are common?*
Those associated with infection: fever, elevated white count, malaise
Endogenous Endophthalmitis

Bacterial

Fungal

*How does endogenous bacterial endophthalmitis present?*
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*What systemic findings are common?*
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*What ocular complaints are typically associated with endogenous bacterial endophthalmitis?*
Endogenous Endophthalmitis

Bacterial

Fungal

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What ocular complaints are typically associated with endogenous bacterial endophthalmitis?
The acute onset of pain, redness and decreased vision
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Fungal

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The acute onset of pain, redness and decreased vision

What ocular signs are typically found?
--Periorbital/lid edema
--A red, angry eye
--A fibrinous AC +/- hypopyon
--Vitreous inflammation
--Retinal microabscesses may be present, or white-centered hemorrhages (aka Roth spots)
**Endogenous Endophthalmitis**

**Bacterial**

**Fungal**

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Bacterial endophthalmitis
Bacteria are frequently classified with respect to a basic microbiologic property. What is it?
Bacteria are frequently classified with respect to a basic microbiologic property. What is it? Whether they are G(+) or G(-)
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Which three G(+) bugs are most commonly implicated in endogenous bacterial endophthalmitis?
**Endogenous Endophthalmitis**

- **Bacterial**
  - Gram(+):
    - Strep
    - Staph
    - Bacillus
  - Gram(-)
- **Fungal**

*Bacteria are frequently classified with respect to a basic microbiologic property. What is it? Whether they are G(+) or G(-)*

*Which three G(+) bugs are most commonly implicated in endogenous bacterial endophthalmitis?*
Staph
‘Clusters’

Strep
‘Chains’

Bacillus
‘G+ rods’
Bacteria are frequently classified with respect to a basic microbiologic property. What is it? Whether they are G(+) or G(-)

Which three G(+) bugs are most commonly implicated in endogenous bacterial endophthalmitis?

Which four G(-) bugs are most commonly implicated in endogenous bacterial endophthalmitis?
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Which three G(+) bugs are most commonly implicated in endogenous bacterial endophthalmitis?

Which four G(-) bugs are most commonly implicated in endogenous bacterial endophthalmitis?
*N meningitidis*: ‘Diplococci in PMNs’

*H flu*: ‘Short rods’

*E coli*: ‘Nothing special’

*Klebsiella*: ‘Very large capsule’
What are the five classic clinical scenarios associated with endogenous endophthalmitis?

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What are the five classic clinical scenarios associated with endogenous endophthalmitis?

--Endocarditis
--Skin infection
--IVDU
--Liver abscess
--UTI
What are the five classic clinical scenarios associated with endogenous endophthalmitis? Which bacterial cause above is classically associated with each?

-- Endocarditis?
-- Skin infection
-- IVDU
-- Liver abscess
-- UTI
Endogenous Endophthalmitis

**Bacterial**

- **Gram(+)**
  - Strep
  - Staph
  - Bacillus

- **Gram(-)**
  - *N. meningitidis*
  - *H. flu*
  - *E. coli*
  - *Klebsiella*

**Fungal**

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**What are the five classic clinical scenarios associated with endogenous endophthalmitis?**

**Which bacterial cause above is classically associated with each?**

---

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Bacterial
- Gram(+)
  - Strep
  - Staph
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- Gram(-)
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  - H flu
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Fungal

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Endogenous Endophthalmitis

Bacterial

Gram (+)
- Strep
- Staph
- Bacillus

Gram (-)
- H. influenzae
- E. coli
- Klebsiella

Fungal

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Gram(-)
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- *H. flu*
- *E. coli*
- *Klebsiella*

Fungal

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Which bacterial cause above is classically associated with each?

- Endocarditis? *Strep*
- Skin infection? *Staph*
- IVDU? *Bacillus*
- Liver abscess? *Klebsiella*
- UTI? *E. coli*

Which is the most common in North America?
Endogenous Endophthalmitis

Bacterial

Gram(+) - Strep
- Staph
- Bacillus

Gram(-)
- N meningitidis
- H flu
- E coli
- Klebsiella

Fungal

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Which bacterial cause above is classically associated with each?

- Endocarditis? Strep
- Skin infection? Staph
- IVDU? Bacillus
- Liver abscess? Klebsiella
- UTI? E coli

Which is the most common in North America?
Endocarditis accounts for % here
What are the five classic clinical scenarios associated with endogenous endophthalmitis? Which bacterial cause above is classically associated with each?

--- Endocarditis? **Strep**
--Skin infection? **Staph**
--IVDU? **Bacillus**
--Liver abscess? **Klebsiella**
--UTI? **E coli**

Which is the most common in North America? Endocarditis accounts for 40% here
Endogenous Endophthalmitis

What are the five classic clinical scenarios associated with endogenous endophthalmitis?
What bacterial cause above is classically associated with each?

--Endocarditis? Strep
--Skin infection? Staph
--IVDU? Bacillus
--Liver abscess? Klebsiella
--UTI? E coli

Which is the most common in North America?
Endocarditis accounts for 40% here

Which cause is in second place here?
Endogenous Endophthalmitis

Bacterial

Gram(+)  
- Strep  
- Staph  
- Bacillus

Gram(-)  
- N meningitidis  
- H flu  
- E coli  
- Klebsiella

Fungal

What are the five classic clinical scenarios associated with endogenous endophthalmitis? Which bacterial cause above is classically associated with each?
-- Endocarditis? Strep
-- Skin infection? Staph
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Which is the most common in North America?
Endocarditis accounts for 40% here

Which cause is in second place here?
UTI, accounting for about % of cases
Endogenous Endophthalmitis

Bacterial

- Gram(+) Strep
- Gram(+) Staph
- Gram(+) Bacillus

- Gram(-) N meningitidis
- Gram(-) H flu
- Gram(-) E coli
- Gram(-) Klebsiella

Fungal

What are the five classic clinical scenarios associated with endogenous endophthalmitis?

Which bacterial cause above is classically associated with each?

- Endocarditis? Strep
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Which is the most common in North America?
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UTI, accounting for about 1/3 of cases
What are the five classic clinical scenarios associated with endogenous endophthalmitis? Which bacterial cause above is classically associated with each?

-- Endocarditis? *Strep*
-- Skin infection? *Staph*
-- IVDU? *Bacillus*
-- Liver abscess? *Klebsiella*
-- UTI? *E coli*

*Which is the most common in Asia?*
Endogenous Endophthalmitis

Bacterial

- Gram(+):
  - Strep
  - Staph
  - Bacillus

- Gram(-):
  - N meningitidis
  - H flu
  - E coli
  - Klebsiella

Fungal

What are the five classic clinical scenarios associated with endogenous endophthalmitis? Which bacterial cause above is classically associated with each?

- Endocarditis? Strep
- Skin infection? Staph
- IVDU? Bacillus
- Liver abscess? Klebsiella
- UTI? E coli

Which is the most common in Asia? Of endogenous endophthalmitis there is associated with Klebsiella liver abscesses!
**Endogenous Endophthalmitis**

- **Bacterial**
  - Gram(+) Bacteria:
    - Strep
    - Staph
    - Bacillus
  - Gram(-) Bacteria:
    - *N meningitidis*
    - *H flu*
    - *E coli*
    - *Klebsiella*

- **Fungal**

---

**What are the five classic clinical scenarios associated with endogenous endophthalmitis?**

**Which bacterial cause above is classically associated with each?**

- **Endocarditis?** *Strep*
- **Skin infection?** *Staph*
- **IVDU?** *Bacillus*
- **Liver abscess?** *Klebsiella*
- **UTI?** *E coli*

---

**Which is the most common in Asia?**

60% of endogenous endophthalmitis there is associated with *Klebsiella* liver abscesses!
Endogenous Endophthalmitis

Bacterial

Gram(+)  Gram(-)
- Strep
- Staph
- Bacillus
- N meningitidis
- H flu
- E coli
- Klebsiella

What are the five classic clinical scenarios associated with endogenous endophthalmitis? Which bacterial cause above is classically associated with each?
--Endocarditis? Strep
--Skin infection? Staph
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How is endogenous bacterial endophthalmitis treated?
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--UTI? E coli

How is endogenous bacterial endophthalmitis treated?
With vitrectomy and intravitreal antibiotics. Consideration should be given to IV abx as well.
**Endogenous Endophthalmitis**

**Bacterial**
- **Gram(+)**
  - Strep
  - Staph
  - Bacillus
- **Gram(-)**
  - *N. meningitidis*
  - *H. flu*
  - *E. coli*
  - *Klebsiella*

**Fungal**

What are the five classic clinical scenarios associated with endogenous endophthalmitis? Which bacterial cause above is classically associated with each?
- Endocarditis? *Strep*
- Skin infection? *Staph*
- IVDU? *Bacillus*
- Liver abscess? *Klebsiella*
- UTI? *E. coli*

How is endogenous bacterial endophthalmitis treated?
With vitrectomy and intravitreal antibiotics. Consideration should be given to IV abx as well. Additionally, the extraocular nidus of infection should be managed by the appropriate service.
Endogenous Endophthalmitis

Bacterial

Fungal

How does the presentation of endogenous fungal endophthalmitis differ from the bacterial form?
How does the presentation of endogenous fungal endophthalmitis differ from the bacterial form? The onset of symptoms (pain, redness decreased vision) is generally more insidious.
How does the presentation of endogenous **fungal** endophthalmitis differ from the bacterial form? The onset of symptoms (pain, redness decreased vision) is generally more insidious

*What ocular signs are typically found?*
How does the presentation of endogenous fungal endophthalmitis differ from the bacterial form? The onset of symptoms (pain, redness, decreased vision) is generally more insidious.

What ocular signs are typically found?
Endogenous fungal endophthalmitis generally progresses in a particular fashion. First, isolated choroidal metastatic lesions appear. With time, these break through Bruch's membrane to involve the retina. Eventually, the bug reaches the vitreous, and (if still unchecked) the anterior segment.
Endogenous Endophthalmitis

Fungi are frequently classified with respect to a basic microbiologic property. What is it?
Endogenous Endophthalmitis

Fungi are frequently classified with respect to a basic microbiologic property. What is it? Whether they are **yeast**, **molds** or **dimorphic**
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Fungi are frequently classified with respect to a basic microbiologic property. What is it? Whether they are yeast, molds, or dimorphic.
Yeast vs Molds (vs bacteria)
Endogenous Endophthalmitis

Bacterial

Fungal

Yeast

Molds

Dimorphic

What's the difference between a yeast and a mold? Yeasts are fungi that exist mainly as unicellular entities, whereas molds are multicellular organisms organized as structures called hyphae (the fancy term for the long, branching filaments molds form as they grow).

What does it mean to say a fungus is dimorphic?

Fungi are frequently classified with respect to a basic microbiologic property. What is it? Whether they are yeast, molds or dimorphic.
Endogenous Endophthalmitis

Bacterial

Fungal

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Dimorphic

What's the difference between a yeast and a mold? Yeasts are fungi that exist mainly as unicellular entities, whereas molds are multicellular organisms organized as structures called hyphae (the fancy term for the long, branching filaments molds form as they grow).

What does it mean to say a fungus is dimorphic? It means the organism exists as a yeast in the body, but as a mold in the environment.

Fungi are frequently classified with respect to a basic microbiologic property. What is it? Whether they are yeast, molds or dimorphic.
Yeast vs Molds (vs bacteria)
Fungi are frequently classified with respect to a basic microbiologic property. What is it?
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Which two yeasts are most commonly implicated in endogenous fungal endophthalmitis?
Endogenous Endophthalmitis

Fungi are frequently classified with respect to a basic microbiologic property. What is it? Whether they are yeast, molds or dimorphic.

Which two yeasts are most commonly implicated in endogenous fungal endophthalmitis?
*Candida*: ‘Budding’

*Cyptococcus*: ‘India ink’
Fungi are frequently classified with respect to a basic microbiologic property. What is it? Whether they are **yeast**, **molds** or **dimorphic**

Which two yeasts are most commonly implicated in endogenous fungal endophthalmitis?

Which **mold** is most commonly implicated in endogenous fungal endophthalmitis?
**Endogenous Endophthalmitis**

- **Bacterial**
- **Fungal**
  - **Yeast**
    - *Candida*
    - *Cryptococcus*
  - **Molds**
    - *Aspergillus*
  - **Dimorphic**

---

Fungi are frequently classified with respect to a basic microbiologic property. What is it? Whether they are **yeast**, **molds** or **dimorphic**

Which two yeasts are most commonly implicated in endogenous fungal endophthalmitis?

Which **mold** is most commonly implicated in endogenous fungal endophthalmitis?
Aspergillus: ‘Broad hyphae’
Fungi are frequently classified with respect to a basic microbiologic property. What is it? Whether they are yeast, molds or dimorphic

Which two yeasts are most commonly implicated in endogenous fungal endophthalmitis?

Which mold is most commonly implicated in endogenous fungal endophthalmitis?

Which dimorphic fungus is most commonly implicated in endogenous fungal endophthalmitis?
Endogenous Endophthalmitis

Fungi are frequently classified with respect to a basic microbiologic property. What is it? Whether they are yeast, molds or dimorphic

Which two yeasts are most commonly implicated in endogenous fungal endophthalmitis?

Which mold is most commonly implicated in endogenous fungal endophthalmitis?

Which dimorphic fungus is most commonly implicated in endogenous fungal endophthalmitis?
Coccidioides: ‘Spherules’
Endogenous Endophthalmitis

Is Candida a common cause of endogenous fungal endophthalmitis?

Fungal

Yeast
- Candida
  - Cryptococcus

Molds
- Aspergillus

Dimorphic
- Coccidioides

Generally speaking, who is at risk?
- Hospitalized, debilitated individuals
- --Hx major GI surgery
- --Chronic lines/catheters (Classic story: Pt s/p GI surgery is NPO and receiving TPN)
- --Systemic antibiotics (think sepsis pt)

How about being immunocompromised?
- This does not seem to be a risk factor (eg, HIV/AIDS is not a risk factor for Candida endophthalmitis)

If a pt is found to have candidemia, what should the primary team do (besides treat it)?
- They should consult ophthalmology for an urgent DFE, and the pt should be followed closely for at least two weeks to ensure Candida endophthalmitis doesn't develop
Endogenous Endophthalmitis

Is Candida a common cause of endogenous fungal endophthalmitis?
Yes—in fact, it is the most common cause in both adults and children.
Endogenous Endophthalmitis

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Fungal

- Yeast
  - Candida
    - Cryptococcus
  - Aspergillus
- Molds
- Dimorphic
  - Coccidioides
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Generally speaking, who is at risk?  
Hospitalized, debilitated individuals

Is there anything in particular that puts them at risk?  
--
--
--

Fungal

Yeast

Candida

Cryptococcus

Molds

Aspergillus

Dimorphic

Coccidioides
**Endogenous Endophthalmitis**

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Endogenous Endophthalmitis

How does Candida endophthalmitis present?

- **Yeast**: Candida, Cryptococcus
- **Molds**: Aspergillus
- **Dimorphic**: Coccidioides

**Fungal**

- How does Candida endophthalmitis present?
  - Like other fungal entities, it starts with choroidal lesions.
  - Pts will c/o decreased VA if one of the lesions affects the macular region.
  - Specifically, the choroidal lesions are bilateral, multiple, white and small (<1DD).
  - What about the vitreous?
    - The classic finding is inflammatory aggregates arranged like a 'string of pearls'.
  - Can the anterior segment be involved?
    - Yes. And if it is, the pain is usually severe.

**How is Candida endophthalmitis treated?**

- This depends upon what 'phase' the disease is in.
- If the infection is limited to the choroid (ie, there is no vitreal involvement), it can be treated with PO fluconazole + voriconazole.
- Once the infection involves the vitreous, intravitreal antifungals (Ampho B; voriconazole) +/- dexamethasone should be used; vitrectomy should be considered.
- Severe cases require PPV, intravenous Ampho B, and oral voriconazole (+/- other agents).
Endogenous Endophthalmitis

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Fungal

Yeast
- Candida
- Cryptococcus

Molds
- Aspergillus

Dimorphic
- Coccidioides
*Candida* endophthalmitis
**Endogenous Endophthalmitis**

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*What about the vitreous?*

1. **Yeast**
   - *Candida*
   - *Cryptococcus*

2. **Molds**
   - *Aspergillus*

3. **Dimorphic**
   - *Coccidioides*
**Endogenous Endophthalmitis**

**How does Candida endophthalmitis present?**
Like other fungal entities, it starts with choroidal lesions. Pts will c/o decreased VA if one of the lesions affects the macular region.

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**What about the vitreous?**
The classic finding is inflammatory aggregates arranged like a "three words".

![Diagram showing fungal entities: Candida, Cryptococcus, Aspergillus, Coccidioides]
Endogenous Endophthalmitis

How does Candida endophthalmitis present?
Like other fungal entities, it starts with choroidal lesions. Pts will c/o decreased VA if one of the lesions affects the macular region.

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What about the vitreous?
The classic finding is inflammatory aggregates arranged like a ‘string of pearls’

Fungal

Yeast

Candida

Cryptococcus

Molds

Aspergillus

Dimorphic

Coccidioides
Candida endophthalmitis: ‘String of pearls’
**Endogenous Endophthalmitis**

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What about the vitreous? The classic finding is inflammatory aggregates arranged like a ‘string of pearls’

Can the anterior segment be involved?

---

**Fungal**

- Yeast
  - **Candida**
  - **Cryptococcus**

- Molds
  - Aspergillus

- Dimorphic
  - **Coccidioides**
**Endogenous Endophthalmitis**

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Endogenous Endophthalmitis

- Yeast
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This depends upon what ‘phase’ the disease is in…
--If the infection is limited to the choroid (ie, there is no vitreal involvement): it can be treated with PO fluconazole + voriconazole.
--Once the infection involves the vitreous:
**Endogenous Endophthalmitis**

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--If the infection is limited to the choroid (ie, there is no vitreal involvement): it can be treated with PO fluconazole + voriconazole.
--Once the infection involves the vitreous: intravitreal antifungals (Ampho B; voriconazole) +/- dexamethasone should be used; vitrectomy should be considered.
--Severe cases require:
Endogenous Endophthalmitis

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--Severe cases require: PPV, intravenous Ampho B, and oral voriconazole (+/- other agents).
Candida endophthalmitis: Pre- and post-tx
Is being immunocompromised a risk factor for Cryptococcus endophthalmitis? Yes, definitely. Cryptococcus is a common fungal ocular infection in HIV/AIDS patients. Cryptococcus is also notorious for causing fungal meningitis in these patients. Who is at risk for Cryptococcus endophthalmitis? Patients with HIV/AIDS who have cryptococcal meningitis. How does Cryptococcus endophthalmitis present? Similar to Candida, it starts with choroidal lesions, and patients will present with decreased visual acuity if one of the lesions affects the macular region. Unlike Candida, the choroidal lesions tend to be larger and fewer in number. The optic nerve head (ONH) may be edematous due to concomitant meningitis and increased intracranial pressure (ICP). How is Cryptococcus endophthalmitis managed? Intravenous Ampho B is the mainstay of treatment.
Endogenous Endophthalmitis

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Cryptococcus is notorious for causing what nonocular condition in HIV/AIDS pts?
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Intravenous Ampho B is the mainstay of treatment
**Endogenous Endophthalmitis**

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Cryptococcus *is notorious for causing what nonocular condition in HIV/AIDS pts?*
Fungal meningitis

*Who is at risk for Cryptococcus endophthalmitis?*

**Fungal**

- Yeast
  - Candida
  - **Cryptococcus**
- Molds
  - Aspergillus
- Dimorphic
  - Coccidioides
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Cryptococcus is notorious for causing what nonocular condition in HIV/AIDS pts?
Fungal meningitis

Who is at risk for Cryptococcus endophthalmitis?
An HIV/AIDS pt with cryptococcal meningitis

How does Cryptococcus endophthalmitis present?
As with Candida, it starts with choroidal lesions, and pts will c/o decreased VA if one of the lesions affects the macular region. Unlike Candida, the choroidal lesions tend to be larger and fewer in number.

The ONH may be edematous—why?
Because of concomitant meningitis

How is Cryptococcus endophthalmitis managed?
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Is being immunocompromised a risk factor for Cryptococcus endophthalmitis? Definitely. Cryptococcus is a common fungal ocular infection in HIV/AIDS.

Cryptococcus is notorious for causing what nonocular condition in HIV/AIDS pts? Fungal meningitis

Who is at risk for Cryptococcus endophthalmitis? An HIV/AIDS pt with cryptococcal meningitis

How does Cryptococcus endophthalmitis present? As with Candida, it starts with choroidal lesions, and pts will c/o decreased VA if one of the lesions affects the macular region.
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The ONH may be edematous--why?
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The ONH may be edematous--why? Because of concomitant meningitis and increased ICP
Endogenous Endophthalmitis

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Intravenous Ampho B is the mainstay of treatment
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Is Aspergillus a common cause of endogenous fungal endophthalmitis?

Fungal
- Molds
  - Aspergillus
- Dimorphic
  - Coccidioides

Generally speaking, who is at risk?
Very debilitated individuals—those with chronic severe lung dz, cancer, endocarditis, or severely immunocompromised. One group particularly at risk are those who have undergone liver transplantation.

How does Aspergillus endophthalmitis present?
Unlike other fungal entities, the onset of pain and vision loss is fairly acute. The choroidal lesions are large, macular, and often accompanied by hemorrhagic choroidal and/or retinal lesions. (Unlike the other fungal pathogens discussed, Aspergillus has a propensity for invading blood vessels.)

What about the vitreous?
Unlike Candida endophthalmitis (in which vitreous inflammation may be prominent), the vitreous reaction in Aspergillus endophthalmitis tends to be mild. This dz focuses on the choroid and retina.

How is Aspergillus endophthalmitis managed?
It is an aggressive dz, so aggressive management is the norm. PPV, intravitreal and IV Ampho B, PO antifungals—the whole shebang. Despite aggressive management, VA outcomes are generally poor.
Is Aspergillus a common cause of endogenous fungal endophthalmitis?
No, it is quite rare.

**Endogenous Endophthalmitis**

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*A*sp*ergillus* *after liver transplant*

**Fungal**

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  - *Aspergillus*

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While technically incorrect, it is helpful to think of it this way:
Endogenous Endophthalmitis

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No, it is quite rare

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While technically incorrect, it is helpful to think of it this way:
--Candida endophthalmitis is a dz of the vitreous, whereas
--Aspergillus endophthalmitis is a dz of the retina/choroid
Endogenous Endophthalmitis

Is Aspergillus a common cause of endogenous fungal endophthalmitis?
No, it is quite rare

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How is Aspergillus endophthalmitis managed?

PPV, intravitreal and IV Ampho B, PO antifungals--the whole shebang.

Despite aggressive management, VA outcomes are generally poor.
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Aspergillus endophthalmitis: Pre- and post tx
Endogenous Endophthalmitis

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Why are visual outcomes poor in Aspergillus endophthalmitis? Its tendency to invade blood vessels leads to ischemic maculopathy.

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Endogenous Endophthalmitis

Bacterial

Fungal

Is Coccidioides a common cause of endogenous endophthalmitis?

Molds

Aspergillus

Dimorphic

Coccidioides
Is Coccidioides a common cause of endogenous endophthalmitis?
No, it is VERY rare. It is vastly more likely to cause diseases of the ocular surface (eg, conjunctivitis)
**Endogenous Endophthalmitis**

- **Bacterial**
- **Fungal**
  - **Molds**
  - **Dimorphic**
    - **Coccidioides**

Is Coccidioides a common cause of endogenous endophthalmitis? No, it is VERY rare. It is vastly more likely to cause diseases of the ocular surface (eg, conjunctivitis)

What is the classic geographic location for this organism?

The San Joaquin Valley of central California. It is also found in the Southwest, Mexico and Argentina.

How does Aspergillus endophthalmitis present?

Unlike other fungal entities, the anterior segment tends to be as affected as the posterior. Pts typically present with a granulomatous uveitis (including large iris granulomas), accompanied by chorioretinal lesions of the sort seen in Candida endophthalmitis.

How is Coccidioides endophthalmitis managed?

PO itraconazole unless very severe (in which case Ampho B). Severe cases may require PPV, and iris granulomas may need to be surgically debulked.
**Endogenous Endophthalmitis**

**Bacterial**

**Fungal**

- **Molds**
  - Aspergillus

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Coccidioides endophthalmitis
**Endogenous Endophthalmitis**

- **Fungal**
  - Molds: Aspergillus, Candida, Cryptococcus, Yeast, Molds
  - Dimorphic: Coccidioides

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**Endogenous Endophthalmitis**

**Bacterial**

**Fungal**

**Molds**
- Aspergillus

**Dimorphic**
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- Candida
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