Common Ocular Fungal Pathogens

Fungal pathogens

A logical division among classes of fungi

? ?
Common Ocular Fungal Pathogens

Fungal pathogens

- Yeast
- Molds (filamentous)

A logical division among classes of fungi
Common Ocular Fungal Pathogens

Fungal pathogens

A logical division among classes of fungi

Yeast

Molds (filamentous)

What's the difference between a yeast and a mold?
What’s the difference between a yeast and a mold?
Yeast 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)
Common Ocular Fungal Pathogens

Fungal pathogens

Yeast

Molds (filamentous)
Common Ocular Fungal Pathogens

Fungal pathogens

Yeast
- Candida
- Cryptococcus

Molds (filamentous)
Common Ocular Fungal Pathogens

Fungal pathogens

Yeast
- Candida
- Cryptococcus

Molds (filamentous)

What systemic scenarios are associated with Candida keratitis?
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Common Ocular Fungal Pathogens

Fungal pathogens

Yeast
- Candida
- Cryptococcus

Molds (filamentous)

What systemic scenarios are associated with Candida keratitis?
- Immunosuppression
- Chronic antibiotic use
Common Ocular Fungal Pathogens

Fungal pathogens

Yeast
- *Candida*
- *Cryptococcus*

Molds (filamentous)

*What systemic scenarios are associated with Candida keratitis?*
-- Immunosuppression
-- Chronic antibiotic use

*What ocular conditions are associated with Candida keratitis?*
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--
Common Ocular Fungal Pathogens

Fungal pathogens

Yeast

- Candida
- Cryptococcus

Molds (filamentous)

What systemic scenarios are associated with Candida keratitis?
--Immunosuppression
--Chronic antibiotic use

What ocular conditions are associated with Candida keratitis?
--Chronic topical steroid use
--Longstanding epithelial defect
Common Ocular Fungal Pathogens

Fungal pathogens

Yeast
- Candida
- Cryptococcus

Molds (filamentous)

A logical division among types of molds

? ?
Common Ocular Fungal Pathogens

Fungal pathogens

Yeast
- Candida
- Cryptococcus

Molds (filamentous)
- Septate
- Nonseptate

A logical division among types of molds
Common Ocular Fungal Pathogens

Fungal pathogens

Yeast
- Candida
- Cryptococcus

Molds (filamentous)
- Septate
- Nonseptate

What are septa?
Common Ocular Fungal Pathogens

Fungal pathogens

Yeast
- Candida
- Cryptococcus

Molds (filamentous)
- Septate
- Nonseptate

What are septa?
Cross-walls within hyphae that subdivide them into a series of individual compartments. Septate molds have these cross-walls; nonseptate molds do not.
Common Ocular Fungal Pathogens

Fungal pathogens

Yeast
  └── Candida
  └── Cryptococcus

Molds (filamentous)
  └── Septate
  └── Nonseptate

?
Common Ocular Fungal Pathogens

Fungal pathogens

Yeast
  - Candida
  - Cryptococcus

Molds (filamentous)
  - Septate
    - Fusarium
    - Aspergillus
  - Nonseptate
What two conditions are classically associated with Fusarium and Aspergillus keratitis?
Common Ocular Fungal Pathogens

Fungal pathogens

Yeast
- Candida
- Cryptococcus

Molds (filamentous)

Septate
- Fusarium
- Aspergillus

Nonseptate

What two conditions are classically associated with Fusarium and Aspergillus keratitis?
--Ocular trauma, especially if it involves vegetative matter
--CL wear (especially one of the bugs)
What two conditions are classically associated with Fusarium and Aspergillus keratitis?
--Ocular trauma, especially if it involves vegetative matter
--CL wear (especially Fusarium)
Common Ocular Fungal Pathogens

Fungal pathogens

Yeast
- Candida
- Cryptococcus

Molds (filamentous)
- Septate
- Nonseptate
  - Fusarium
  - Aspergillus

What two conditions are classically associated with Fusarium and Aspergillus keratitis?
--Ocular trauma, especially if it involves vegetative matter
--CL wear (especially Fusarium)

As an aside: What horrible bacterial endophthalmitis is associated with penetrating vegetative trauma?
What two conditions are classically associated with Fusarium and Aspergillus keratitis?
--Ocular trauma, especially if it involves vegetative matter
--CL wear (especially Fusarium)

As an aside: What horrible bacterial endophthalmitis is associated with penetrating vegetative trauma? Bacillus cereus
Common Ocular Fungal Pathogens

Fungal pathogens

Yeast

Candida
Cryptococcus

Molds (filamentous)

Septate
Fusarium
Aspergillus

Nonseptate

?
Common Ocular Fungal Pathogens

Fungal pathogens

Yeast
- *Candida*
- *Cryptococcus*

Molds (filamentous)
- Septate
  - *Fusarium*
  - *Aspergillus*
- Nonseptate
  - *Mucor*
  - *Rhizopus*
Common Ocular Fungal Pathogens

Fungal pathogens

Yeast
  - Candida
  - Cryptococcus

Molds (filamentous)

Septate
  - Fusarium
  - Aspergillus

Nonseptate
  - Mucor
  - Rhizopus

Note: The septated molds account for the majority of ocular fungal infections!
Common Ocular Fungal Pathogens

What is the classic systemic medical problem associated with Mucor/Rhizopus infection?

Molds (filamentous)
- Septate
  - Fusarium
  - Aspergillus
- Nonseptate
  - Mucor
  - Rhizopus

What do ARF and DKA have in common that accounts for this?
Both produce systemic acidosis, which interferes with phagocytosis.

What ophthalmic condition is Mucor/Rhizopus most likely to cause?
Orbital cellulitis
Common Ocular Fungal Pathogens

Fungal pathogens

What is the classic systemic medical problem associated with Mucor/Rhizopus infection? A diabetic in DKA

Molds (filamentous)

Septate

Fusarium

Aspergillus

Nonseptate

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Common Ocular Fungal Pathogens

Fungal pathogens

Molds (filamentous)

What is the classic systemic medical problem associated with Mucor/Rhizopus infection? A diabetic in DKA

Another associated medical condition is acute renal failure. What do ARF and DKA have in common that accounts for this?

Septate
- Fusarium
- Aspergillus

Nonseptate
- Mucor
- Rhizopus
Common Ocular Fungal Pathogens

Fungal pathogens

What is the classic systemic medical problem associated with Mucor/Rhizopus infection?
A diabetic in DKA

Another associated medical condition is acute renal failure. What do ARF and DKA have in common that accounts for this?
Both produce systemic metabolic derangement, which interferes with immune cell action.

Molds (filamentous)

Septate
- Fusarium
- Aspergillus

Nonseptate
- Mucor
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Fungal pathogens

Molds (filamentous)

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Fusarium

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Common Ocular Fungal Pathogens

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Fungal pathogens

Molds (filamentous)

Septate
  - Fusarium
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Nonseptate
  - Mucor
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Common Ocular Fungal Pathogens

Fungal pathogens

Yeast
- Candida
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Molds (filamentous)
- Septate
  - Fusarium
  - Aspergillus
- Nonseptate
  - Mucor
  - Rhizopus

Which is the only fungus that will take a Gram stain?

Candida
Common Ocular Fungal Pathogens

Fungal pathogens

Yeast
- *Candida*
- *Cryptococcus*

Molds (filamentous)
- Septate
  - *Fusarium*
  - *Aspergillus*
- Nonseptate
  - *Mucor*
  - *Rhizopus*

*Which is the only fungus that will take a Gram stain?* *Candida*
Common Ocular Fungal Pathogens

Fungal pathogens

Yeast

- Candida
- Cryptococcus

Molds (filamentous)

- Septate
  - Fusarium
  - Aspergillus

- Nonseptate
  - Mucor
  - Rhizopus

Which fungus is more likely to be a pathogen in cool, northern climes?

Which in warm, humid, southern climes?
Common Ocular Fungal Pathogens

Fungal pathogens

Yeast
- Candida
- Cryptococcus

Molds (filamentous)
- Septate
  - Fusarium
  - Aspergillus
- Nonseptate
  - Mucor
  - Rhizopus

Which fungus is more likely to be a pathogen in cool, northern climes? Yeasts, especially Candida

Which in warm, humid, southern climes? Septated molds, especially Fusarium
Some fungi exist as yeast in the body, but as mold in the environment. What is the term for such fungi?
Some fungi exist as yeast in the body, but as mold in the environment. What is the term for such fungi?
Which dimorphic fungus is most commonly implicated as an ocular pathogen?
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Common Ocular Fungal Pathogens

Fungal pathogens

Coccidioides has a definite geographic preponderance in the United States. What is it?

What sort of ocular involvement is most commonly associated with Coccidioides?

Very rarely, Coccidioides is implicated in a particularly dreadful ocular condition. What is it?

Dimorphic

Coccidioides
Common Ocular Fungal Pathogens

Fungal pathogens

Coccidioides has a definite geographic preponderance in the United States. What is it? The Southwest, particularly the three words San Joaquin Valley of California

What sort of ocular involvement is most commonly associated with Coccidioides? Surface infection, usually conjunctivitis

Very rarely, Coccidioides is implicated in a particularly dreaded ocular condition. What is it? Endogenous endophthalmitis (it is one of the nonneoplastic causes of ‘masquerade syndrome’)

Dimorphic

Coccidioides

Aspergillus

Rhizopus
Common Ocular Fungal Pathogens

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Fungal pathogens

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Fungal pathogens

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Aspergillus

Rhizopus
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Fungal pathogens

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- Candida
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Molds (filamentous)
- Septate
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What two fungi—not on this list—were formerly thought to be protozoa?
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Common Ocular Fungal Pathogens

Fungal pathogens

Yeast
- Candida
- Cryptococcus

Molds (filamentous)
- Microsporidia
- Pneumocystis

What two fungi—not on this list—were formerly thought to be protozoa?
- Pneumocystis
- Microsporidia

Who is at risk for these?
- AIDS pts

What ocular disease does it cause, and in whom?
- Pneumocystis: Choroiditis
- Microsporidia: Epithelial keratitis
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Who is at risk for these?

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  - Candida
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Common Ocular Fungal Pathogens

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  - Cryptococcus
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**What two fungi—not on this list—were formerly thought to be protozoa?**
- Pneumocystis
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**Who is at risk for these?**
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**What ocular disease does each cause in AIDS pts?**
- **Pneumocystis**: Choroiditis
- **Microsporidia**: Epithelial keratitis
Common Ocular Fungal Pathogens

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Molds (filamentous)
- Microsporidia
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Nonseptate

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