2013-2-1 **CANINE HEART** Ahmed M. Abubakar
BOVINE PATHOLOGY

CONTRIBUTING INSTITUTION : The Royal Veterinary college , Dept. of Pathology and Biology

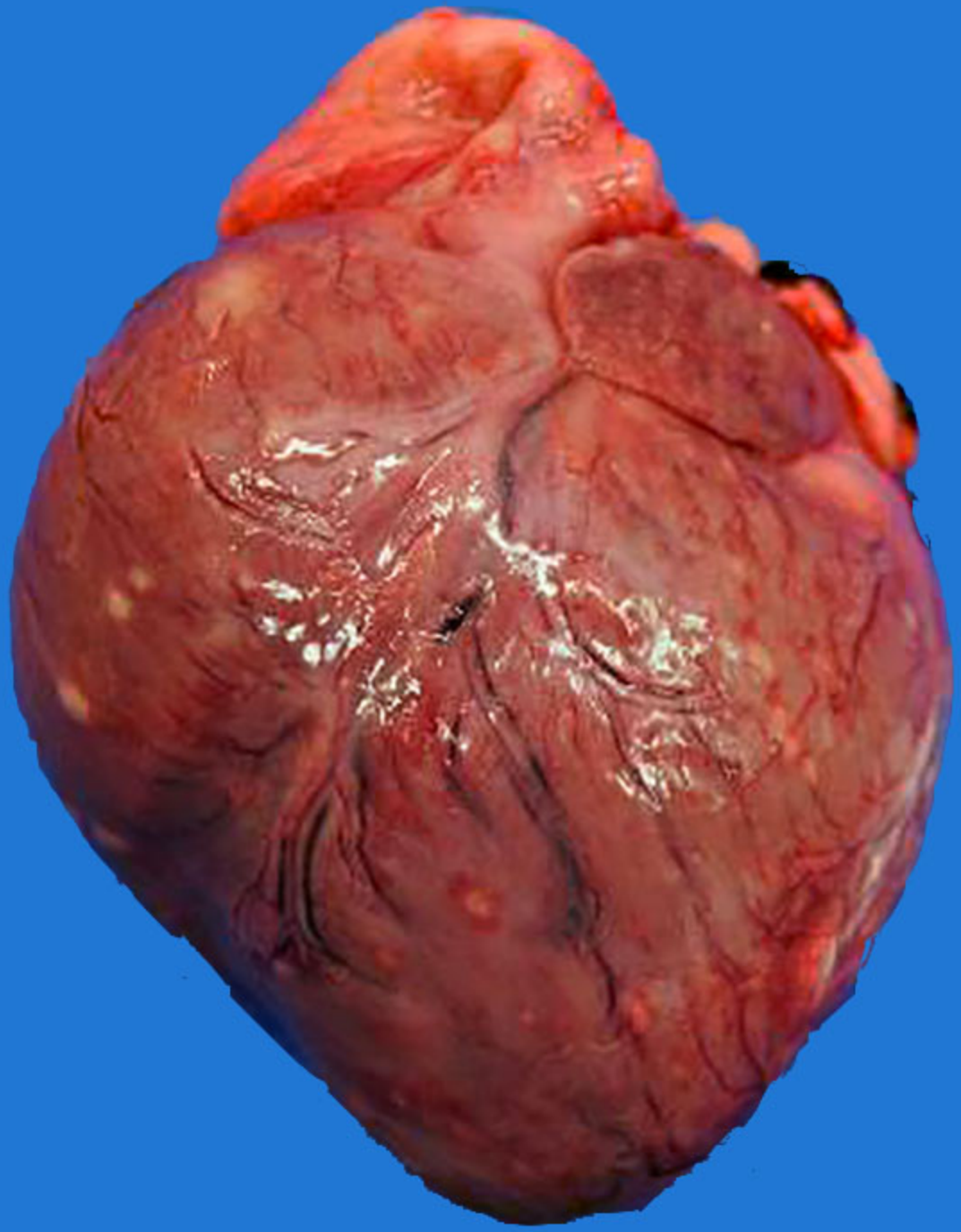
- **Signalment**: 11-month-old male Border Collie dog (*Canis familiaris*)
- **History**: Poor growth, weight loss, chronic upper respiratory infection and pyrexia
- **Gross Pathology**:
  - Ø Pale yellow to white irregular nodules within myocardium, epicardial and endocardial surfaces
  - Ø Similar nodules found on capsular and cut surfaces of kidneys, on lungs, within lobe and meningeal surface of brain
  - Ø Fungal culture yielded *Scedosporium prolificans*
- **Histopathology Description:**
  - Ø Acute coagulative necrosis with aggregates of fibrin mixed with degenerative neutrophils mark with fewer macrophages
  - Ø Karyorrhectic debris and numerous intralestional fungal hyphae
  - Ø Cardiomyofibres are fragmented showing deeply eosinophilic sarcoplasm
  - Ø Myocardium cardiomyofibres have clear separated spaces (edema)

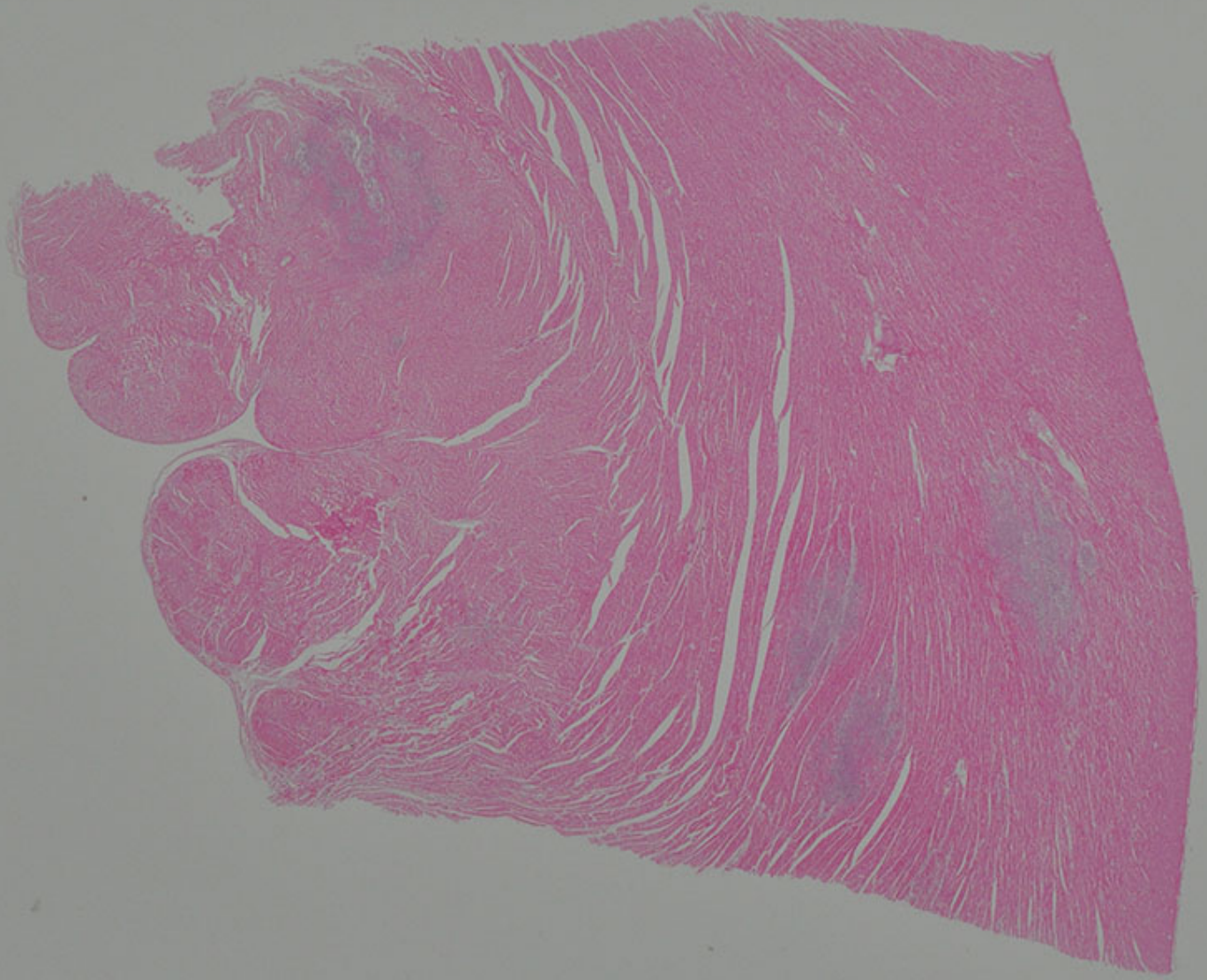
Contributor 's Morphologic Diagnosis:

- Heart presented with myocarditis, suppurative and necrosis, multifocal, moderate acute with intralesional fungal hyphae (*Scedosporium prolificans*)

Contributor's Comment:

- Histological examination showed necrotic foci with fungal hyphae in lungs, kidneys, liver, pancreas, pituitary gland and cerebral cortex with a fungal morphology compatible with *S. prolificans*
- *S. prolificans* in the family Microascaceae can be isolated from the environment (soil and potted plants) which can cause infection in immunocompromised human patients
- *S. prolificans* is resistant to most antifungal agents and infection is reportedly rare in animals but was isolated from a German Shepherd dog
- *S. prolificans* infection in a horse and beagle were associated with osteomyelitis and arthritis, however, Musculoskeletal infection is a common presentation in humans
- Morphologically, *Scedosporium spp* is similar to *Aspergillus spp* therefore culturing fungus allow for more definitive identification
- Conidiophore display distinctly swollen bases with ovoid conidia (hence the previous name *S. inflatum*),
- *Aspergillus terreus* infection is commonly described in German shepherd dogs, other fungal species isolated from dogs with diseminating infection include *Penicillium spp.* , *Paecilomyeces spp*., *Chrysosporium spp*., and *Pseudoallescheria boydii*

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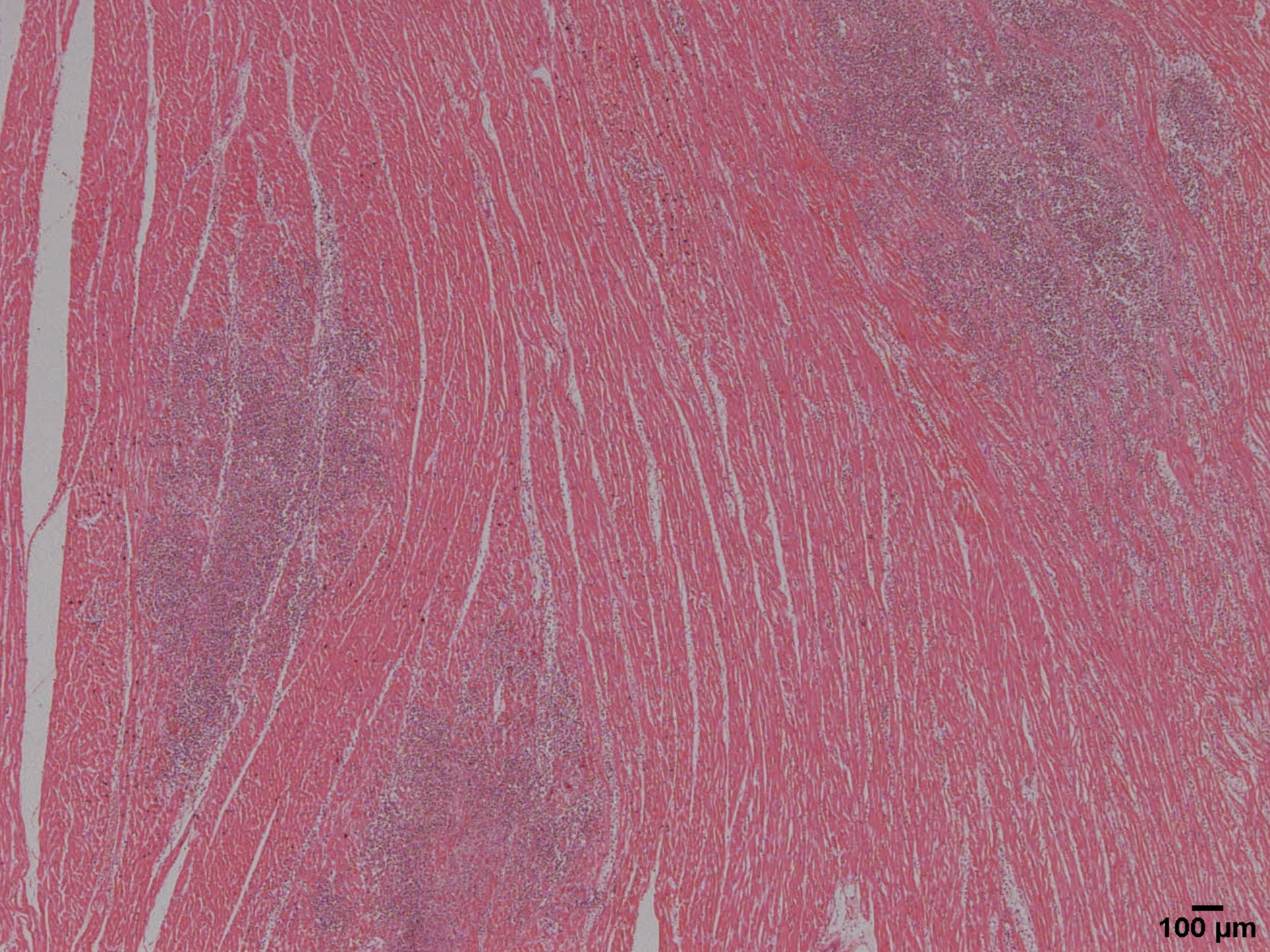
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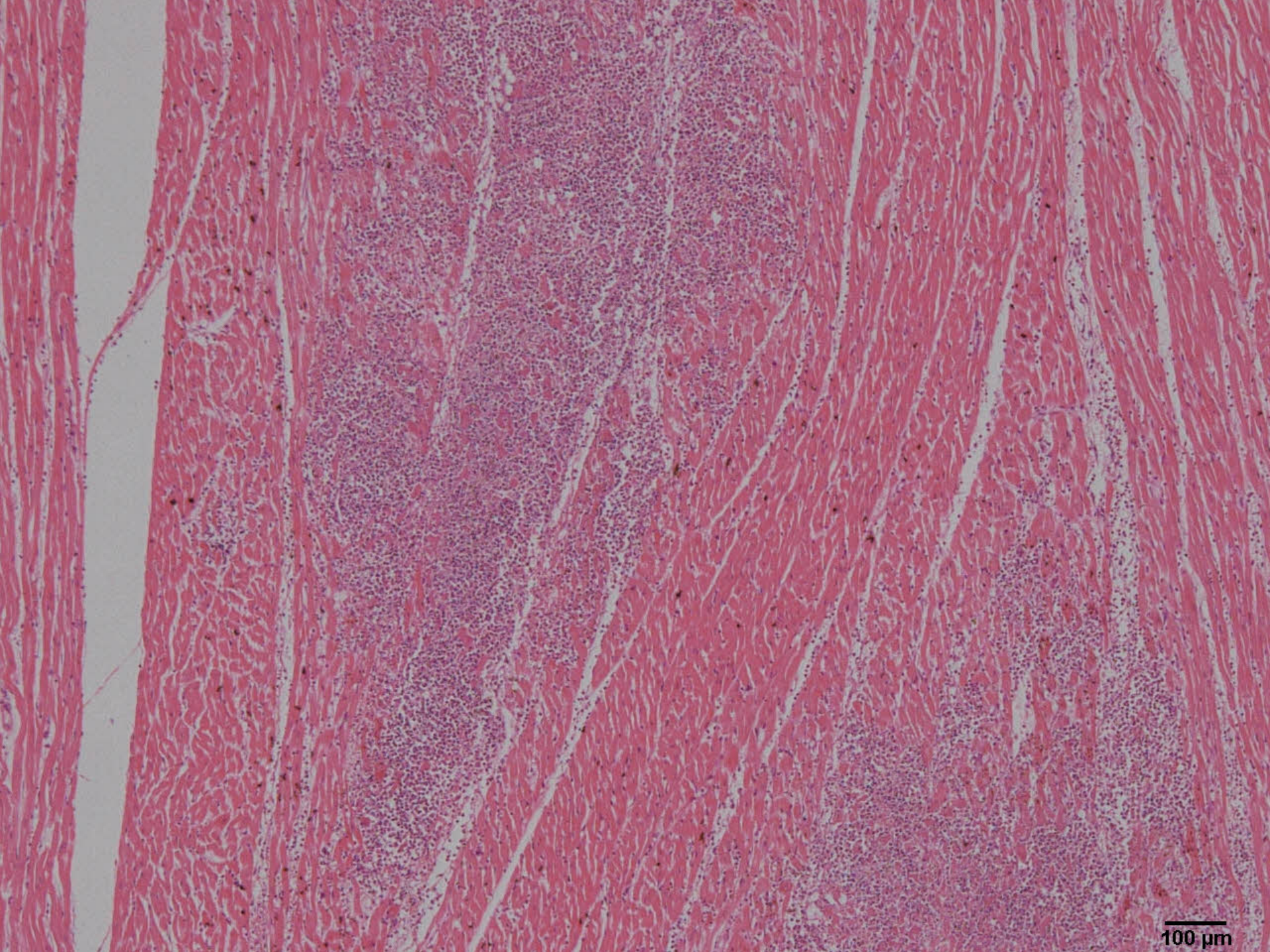
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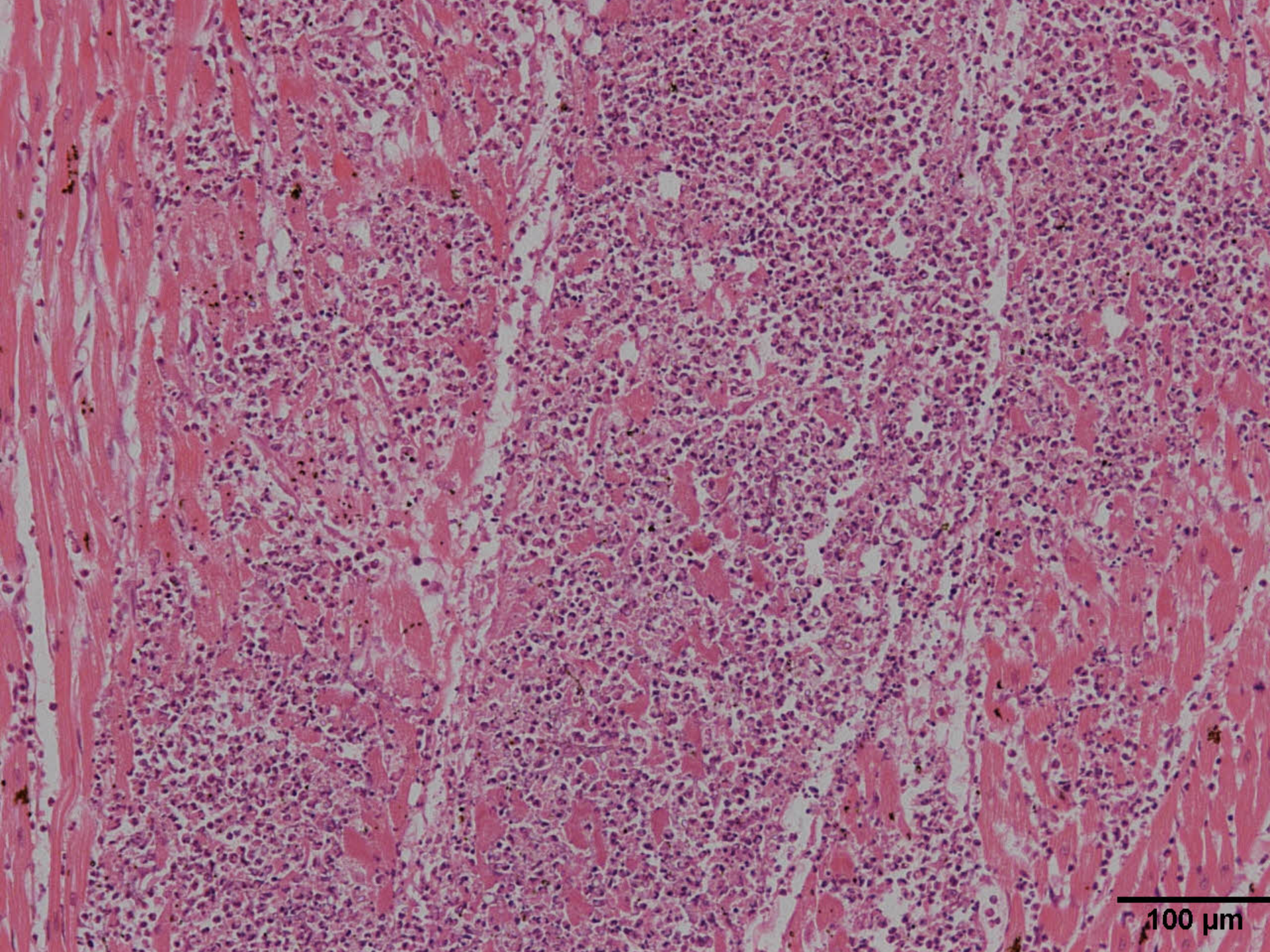
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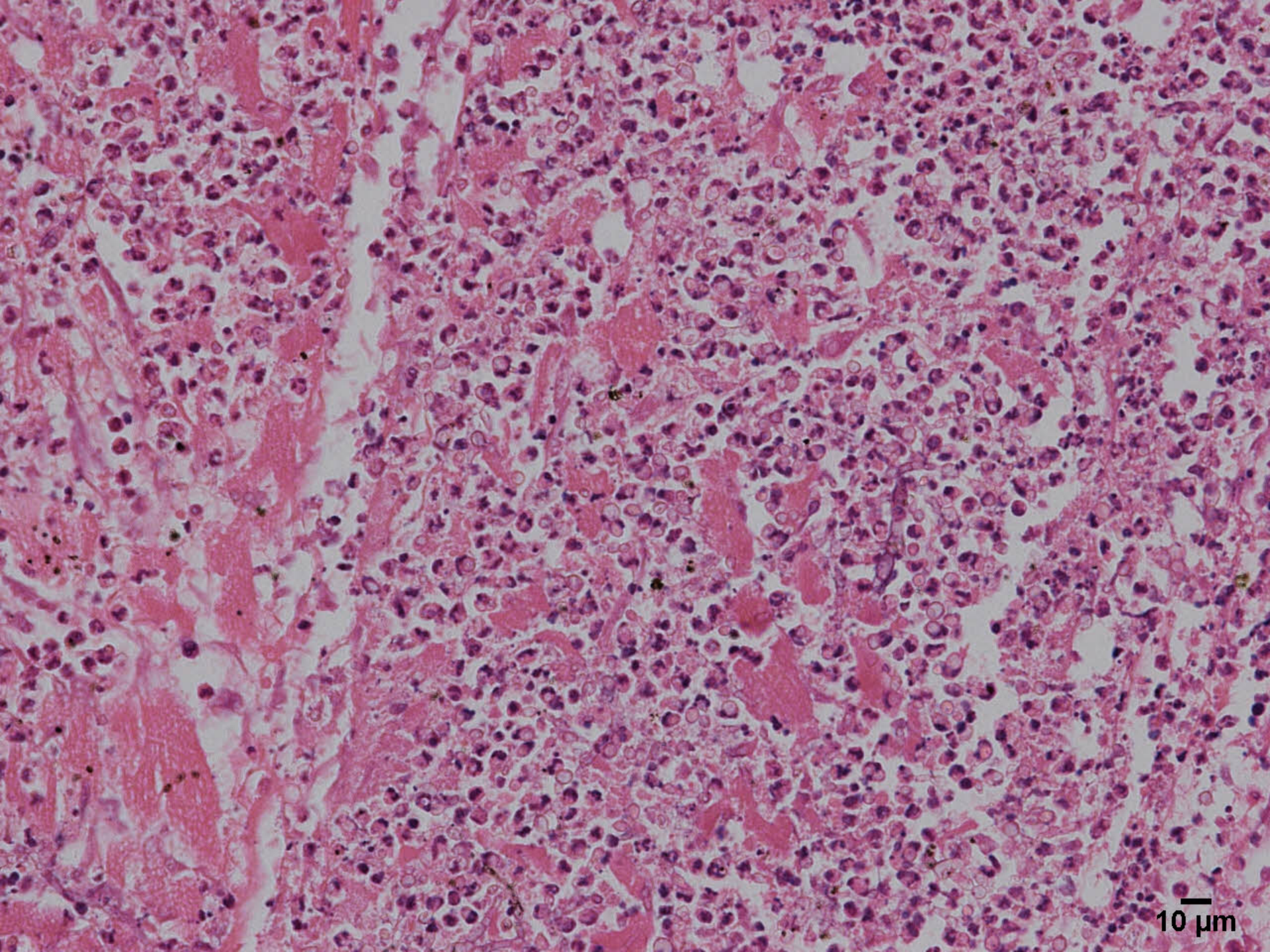
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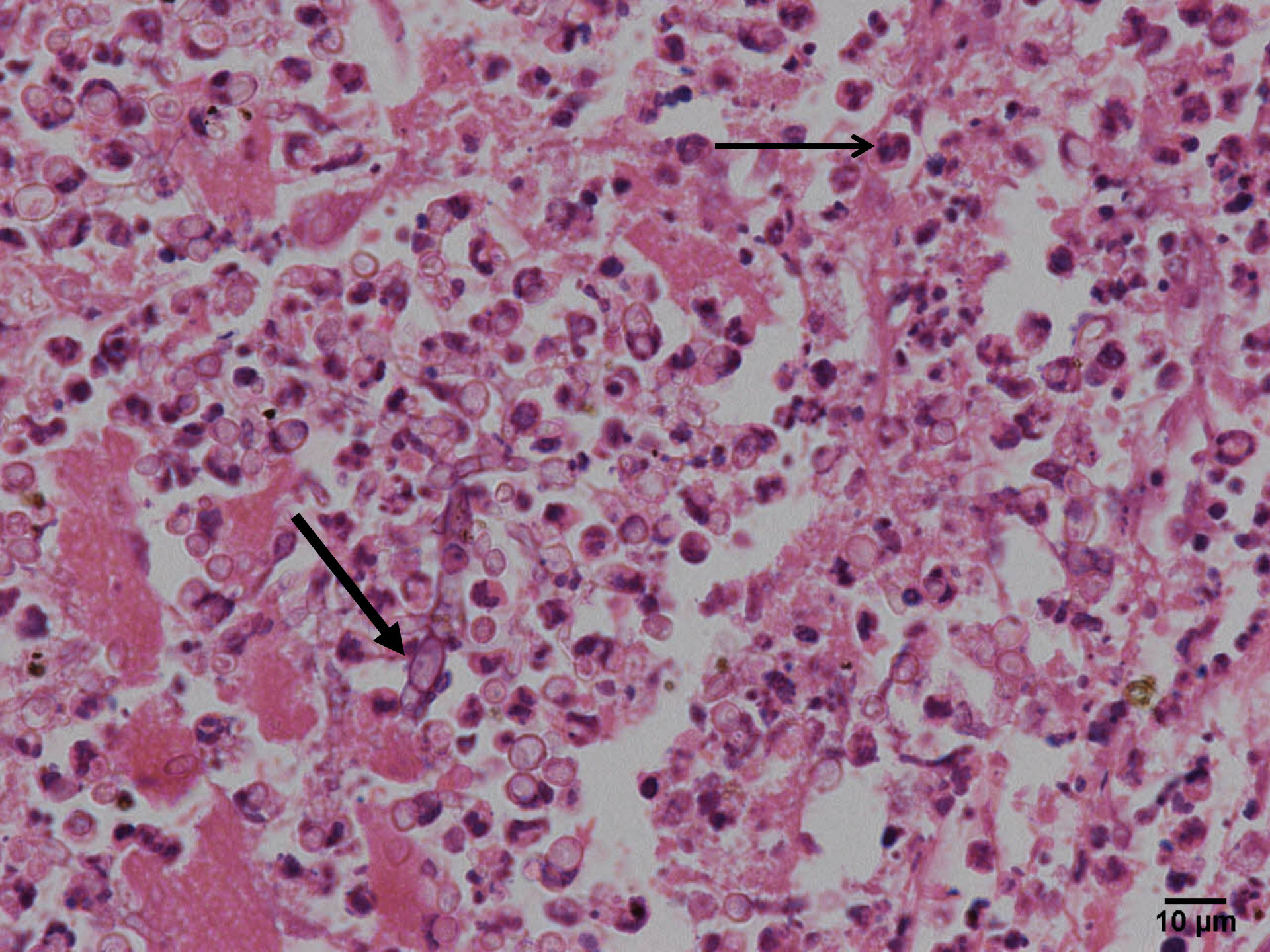
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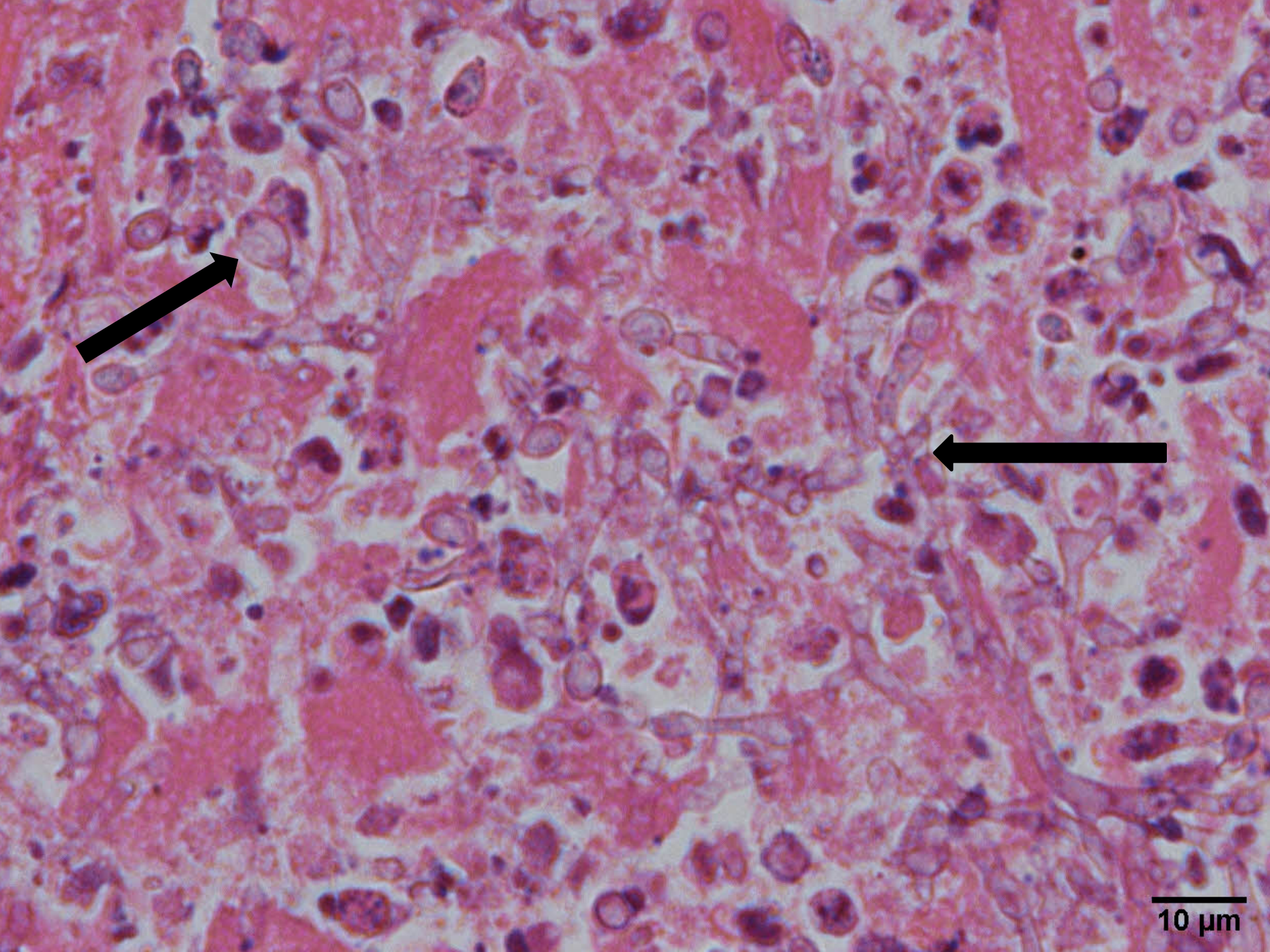
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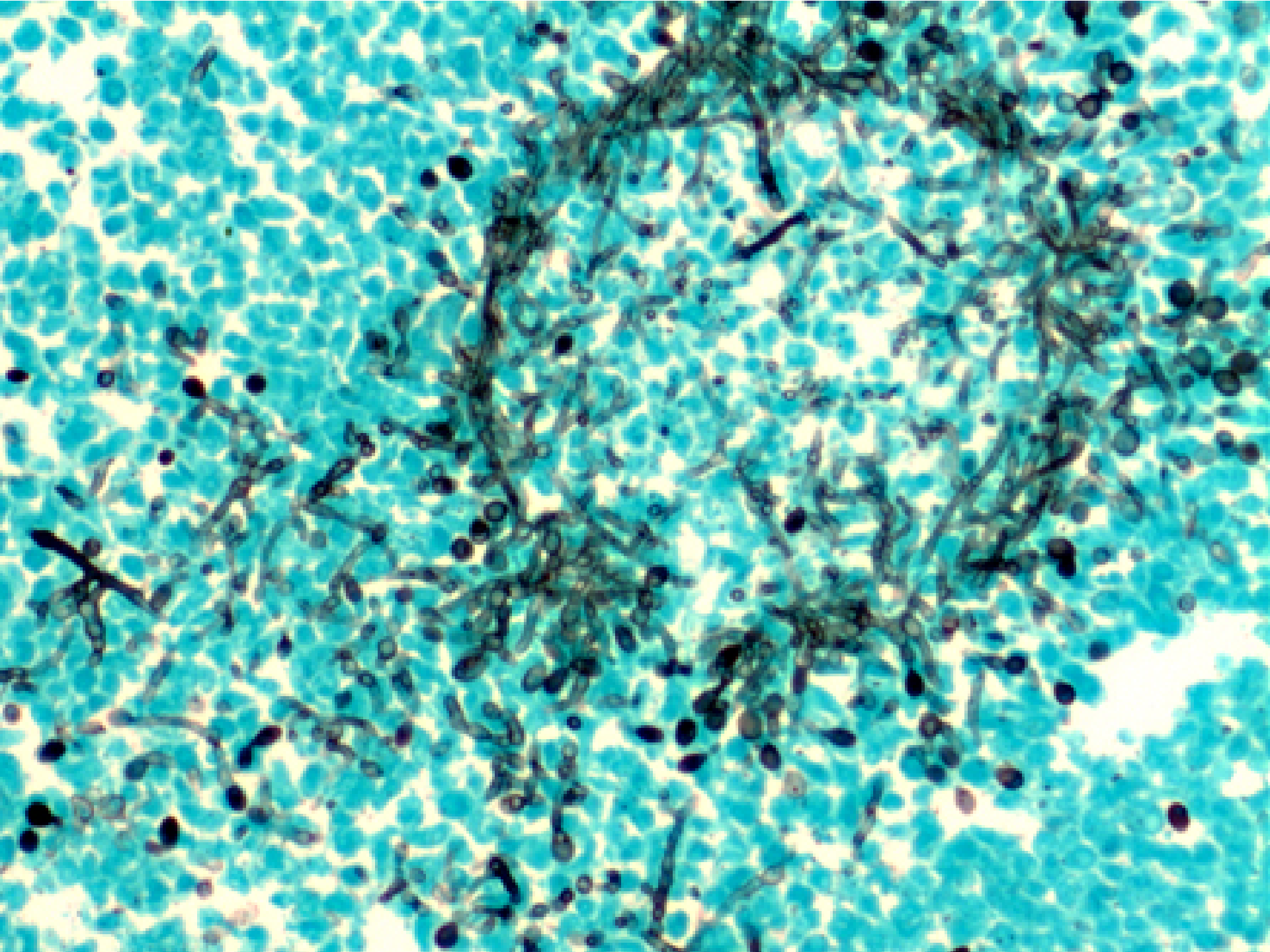

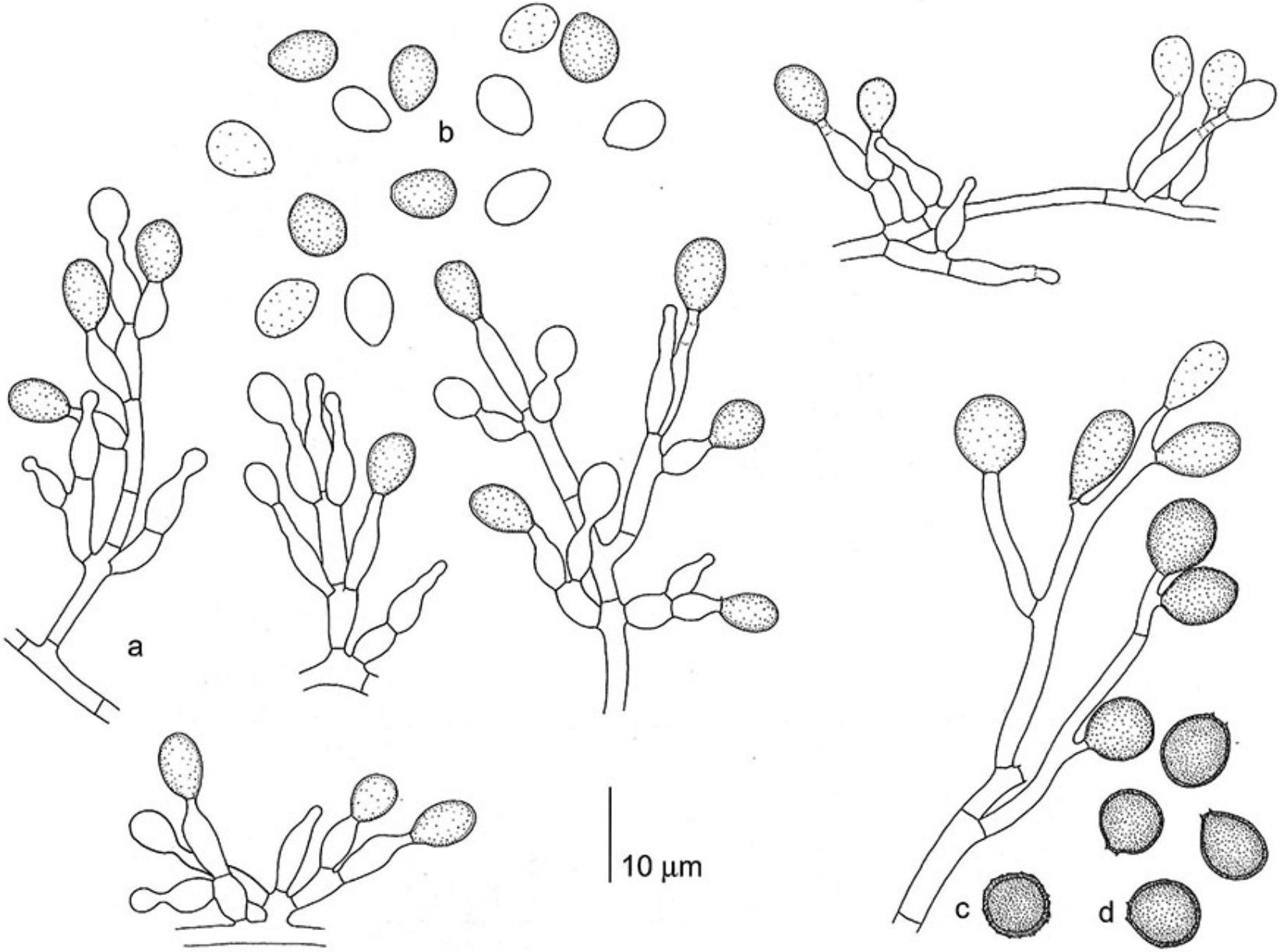
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- **JPC Diagnosis:** Heart: Myocarditis, necrotizing, acute, random , marked with numerous fungal hyphae and conidia
- **Conference comment**:
  - Disseminating pathogenic fungal grouped into two, dimorphic fungal *Blastomyces dermatitides, Histoplasma capsulatum or Coccidioides immitis, a*nd *opportunistic* pathogens like *Aspergillus fumigatus* or *Candida albicans* which are ubiquitous
  - Opportunistic fungal infections in German Shepherd are generally attributed to *Aspergilus terreus*, however *Scedosporium prolificans* has become an emerging opportunistic pathogen in both humans and animals
  - Other differential diagnoses for *S. prolificans* include, *Candida sp*., *Zygomycete*s such as *Absidia*, and *Mucor sp*., or non- fungal agent like *Pythium insidiosum*
  - *S. prolificans is* filamentous, non-pigmented, septate with haphazardly branching hyphae with a lemon-shaped conidiophores from which a small cluster of single-cell conidia emerges and can produce conidia in solid non-aerated tissues like myocardium
  - Comparatively*, Aspergillus* produce a more round conidia in aerated tissues like ectatic bronchi or surface of skin wound *, Candida sp.* on the hand appears in tissue both in hyphae and budding yeast form, which could be confused with *Scedosporium*
  - Pseudohyphae is relatively common in *Candidiasis* and rare in *S. prolificans*
  - *S. prolificans* is resistant to many anti-fungal drugs, hence differentiating it from other opportunistic fungi or fungal-like organism is imperative,
  - Histopathology alone is often difficult to achieve diagnoses hence culture and or PCR are critical