Clinical history

- 42-year-old man with insulin-dependent diabetes mellitus
- Necrotic skin lesion on the scalp
- Suspected abscess identified during debridement, with extension thereof into the subcutis
Diagnosis?

Additional clinical data
- No additional skin lesions
- Absence of diabetic ketoacidosis
- Equivocal history of minor trauma
**Mucormycosis**

**DEFINITION**
- Uncommon invasive fungal infection caused by members of the class Zygomycetes, order Mucorales

**ETIOLOGIC AGENTS**
- *Rhizopus* spp. implicated most frequently
- Others include *Lichtheimia, Mucor, Rhizomucor, Apophysomyces, Cunninghamella, Saksanarea* spp., etc.
Mucormycosis

**FUNGAL MORPHOLOGY**
- Large, broad, ribbon-like
- 10–20 µm diameter
- Non-septate
- Branching at 90°

**DIFFERENTIAL DIAGNOSIS**
1. Aspergillosis
2. Hyalohyphomycosis
3. Entomophthoramycosis

**PREDISPOSING CONDITIONS**
- Immunosuppression, eg.:
  - Neutropenia
  - Organ transplantation
  - Diabetic ketoacidosis
  - Protein-calorie malnutrition
- Immunosuppression ctd:
  - Prematurity
  - Hematolymphoid neoplasia
  - Etc.
- Other, e.g.:
  - Burns
  - Trauma
  - Liver disease
  - Iron overload
  - IV drug use

**CLINICO-PATHOLOGIC FORMS**
- Rhinocerebral
- Pulmonary
- Cutaneous
- Gastrointestinal
- Disseminated
Mucormycosis

**PATHOGENESIS**

- Infection usually follows spore inhalation
- Less often, acquired percutaneously or via ingestion

**SKIN INVOLVEMENT**

- Usually a complication of burns or trauma
- Systemic dissemination from a pulmonary source can occur
- Isolated cutaneous lesions in 27%

**SKIN INVOLVEMENT**

- Initially: small erythematous macules or painless superficial erosions
- Later: enlargement & ulceration, with profuse & offensive purulent discharge

- Clinical appearances may suggest vasculitis, ecthyma gangrenosum or pyoderma gangrenosum
- Associated eschar formation common

Mucormycosis complicating DKA

Mucormycosis complicating DKA
Mucormycosis
**SKIN INVOLVEMENT**

- Excellent prognosis for isolated cutaneous disease
- Mortality rate with localized infection = 4–10%
- Subsequent visceral dissemination: rare

Mucormycosis mimicking gouty &/or pancreatic panniculitis

- Exceedingly uncommon
- Initially described in 2006 in a 6-month-old organ transplant recipient
- Landmark series of 13 cases later reported in 2012

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Mucormycosis mimicking gouty &/or pancreatic panniculitis

• Subsequent report of similar findings in context of cutaneous aspergillosis (at venepuncture site on forearm of 4-month-old boy with ALL)

Pancreatic panniculitis-like mucormycosis

**PROPOSED PATHOGENESIS**

• Ascribed to the production & release of extracellular lipases by fungi
• Subsequent saponification of adipocytic lipid content, with calcification

Gouty panniculitis-like mucormycosis

**PROPOSED PATHOGENESIS**

• Degradation of cell components by fungal proteases & lipases → release of cell degradation products, incl. nucleic acids → metabolization & transformation into uric acid

Gouty panniculitis-like mucormycosis

**PROPOSED PATHOGENESIS**

• Oxalic acid produced by fungi d/t hydrolytic action of oxaloacetate acetylhydrolase on oxaloacetate

Gouty panniculitis-like mucormycosis

**PROPOSED PATHOGENESIS**

• Subsequent tissue deposition in the form of monohydrate crystals
Gouty panniculitis-like mucormycosis

**PROPOSED PATHOGENESIS**

- Calcium oxalate formed following interaction of oxalic acid with serum or tissue calcium


Mucormycosis mimicking gouty &/or pancreatic panniculitis

**DIFFERENTIAL DIAGNOSIS**

1. Pancreatic panniculitis
2. Gouty panniculitis
3. Other forms of crystalline panniculitis

Pancreatic panniculitis

- Rare form of subcut. fat necrosis occurring in the presence of underlying pancreatic disease
- Pancreatic pathology ranges from pancreatitis to neoplasia

Pancreatic panniculitis

- Tender erythematous to violaceous nodules with predilection for lower extremities, buttocks & trunk
- Serum lipase levels do not necessarily correlate with subcutaneous disease
Gouty panniculitis

- Rare form of panniculitis resulting from subcutaneous urate crystal deposition
- Predominantly lobular panniculitis, with necrotic adipocytes containing radially arranged, needle-shaped, doubly refractile crystals
Other forms of crystalline panniculitis

- Subcutaneous fat necrosis of the newborn
- Post-steroid panniculitis
- Sclerema neonatorum

Follow-up in present case

- *Rhizopus* sp. cultured
- Amphotericin B administered, but two additional debridement procedures required
- NED at subsequent follow-up consultation
Mucormycosis

**TAKE-HOME MESSAGE**

- Subcutaneous mucormycosis should always be ruled out when entertaining a possible diagnosis of pancreatic panniculitis and/or gouty panniculitis

Mucormycosis

**TAKE-HOME MESSAGE**

- In the pediatric context, care should be taken not to confuse the gouty panniculitis-like pattern with other forms of crystalline panniculitis

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