4.) **Granules.** These are relatively large (1-2 mm) very hard structures. They are only seen in cases of mycetoma.

Mycetomas are caused by numerous genera of “higher bacteria” (actinomycotic mycetoma) or true fungi (eumycotic mycetoma). This is important because depending upon the etiology they are treated differently.

**Mycetoma cases**

Note granules. Treated with itraconazole.
Histopathology of Mycetomas

5.) **Fission (sclerotic) bodies.** These are round, brown structures that are 15-20 microns in diameter. They are not yeast cells or hyphae. They appear to divide by splitting in the middle (fission).

The etiologic agent are all dematiaceous fungi which live in the soil. The organism enters the body following a puncture wound.
Cases of Chromomycosis

10-year old case

(top) This case developed over 30 years and was seen before the advent of itraconazole.

Fission bodies in Chromomycosis

Note the brown structures. These are histopathology slides but they can be seen readily in KOH preparation of skin.
6.) **Yeast + Hyphae**. In only one major mycosis do we see a combination of yeast and hyphae in tissue. This disease is candidiasis and it is the most important mycosis in the world today.

**Important characteristic of Candidiasis:**

- The major mycosis of immunocompromised patients, e.g., cancer, IVs, underlying diseases, surgery, acute illnesses, age, excessive use of antimicrobials and steroids, major trauma, diabetes, etc.

- 90% of AIDS patients have candidiasis.

**Clinical aspects of Candidiasis**

- **Trush**

- **Fatal candidiasis seen in child lacking T-cells.**

- **Candidiasis of the neck**
Onychomycosis caused by a *Candida* sp.

Cancer patient who died of candidiasis. Numerous white focal points are candidiasis.

Kidney from rabbit injected with steroids and *Candida albicans*. Died in 4 days.
Histopathology of Candidiasis

The dark blue elements (B & B stain) are hyphae and yeast in candidiasis.

This is a PAS stain of candidiasis. All the fungal elements are pink.
Identification of *Candida* spp.

One week old culture of *C. albicans* on Sabourauds agar

Germ tube test: universally used to identify *C. albicans*. Inexpensive and requires only 1-2 hours incubation in serum.

The End