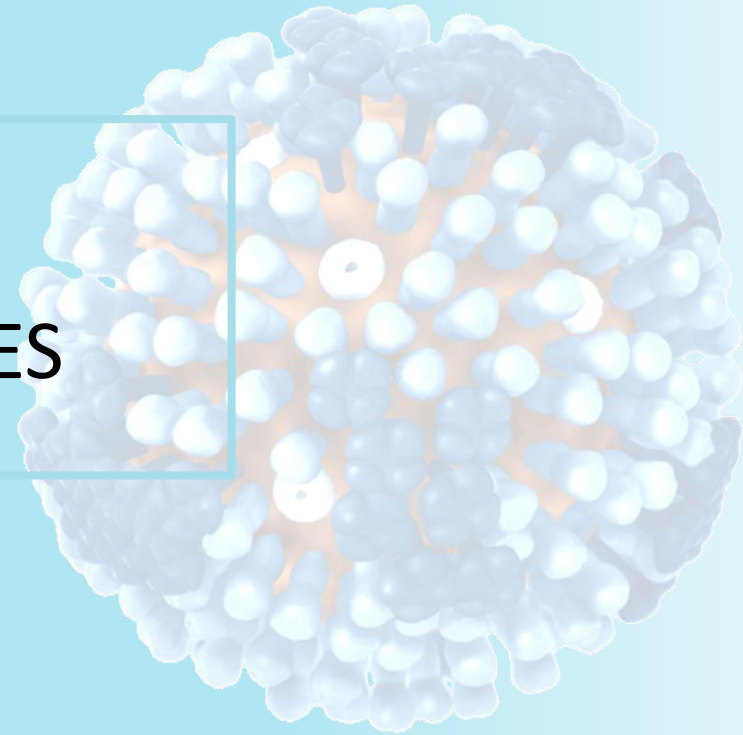


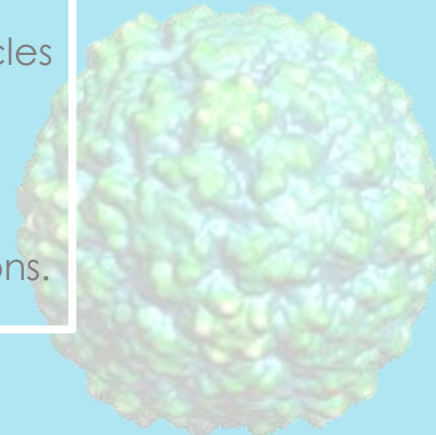


MYCETOMA & AND OTHER SUBCUTANEOUS MYCOSES



OBJECTIVES:

1. Acquire the basic knowledge about mycetoma and the clinical features of the disease
2. Acquire the basic knowledge about other common subcutaneous mycosis and their clinical features.
3. Know the main fungi that affect subcutaneous tissues, muscles and bones.
4. Identify the clinical settings of such infections
5. Know the laboratory diagnosis, and treatment of these infections.



SUBCUTANEOUS MYCOSES

- ✓ **Definition:** Fungal infections involving dermis, subcutaneous tissue, muscle and may extend to bone IF not treated.
- ✓ Fungi usually cause superficial infections but if it was initiated by **trauma** to skin it causes Subcutaneous Mycoses
- ✓ They are difficult to treat, and **Surgical** intervention is frequently needed.
- ✓ Diseases happen in healthy host NOT opportunistic, it's more severe in **Immunocompromised** host, for example, patients with AIDs or Diabetes.

Mycetoma

Subcutaneous
Zygomycosis

Phenohypho-
mycosis

Rhinosporidiosis

Lobomycosis

Chromoblasto-
mycosis

Sporotrichosis

MYCETOMA

Definition: Mycetoma “oma indicates for malignancy” is a chronic, granulomatous disease of the skin and subcutaneous tissue, which sometimes involves muscle, and bones “if not treated”.

- ✓ It is characterized by Swelling “**following trauma**” , abscess formation, and multiple draining sinuses that exude characteristic grains حبوب of “Micro-colonies” clumped organisms
- ✓ It typically affects the lower extremities, but also other areas of the body e.g. hand, back and neck. “depends on site of trauma”.
- ✓ Mycetoma is endemic in tropical, subtropical, and temperate regions. Sudan, Senegal, Somalia, India, Pakistan, Mexico, Venezuela
- ✓ Is more common in **men** than in women (ratio is 3:1).
- ✓ Commonly in people who work in **rural areas, framers** “more exposed to trauma with plant material & soil”



MYCETOMA

Etiology

	<u>Eumycetoma</u>	<u>Actinomycetoma</u>
Cause	Several Mould Fungi	Aerobic Filamentous Gram +ve Bacteria
Examples	Madurella Mycetomatis, Madurella Grisea, and Psedallescheria Boydii	Actinomadura Madurae , Streptomyces Somaliensis and Nocardia Brasiliensis
Grains Color	Black or White	Yellow, White, Yellowish-brown, pinkish-red
Treatment "Antifungal"	Itraconazole	Trimethoprim-sulfamethoxazole, Dapsone, Streptomycin "<u>Combination of 2 drugs is used</u>"
	Therapy is suggested for several months or years (1-2 years or more)	
Notes	Surgical treatment (debridement or amputation) in patient not responding to medical treatment alone and if bone is involved.	Actinomycetoma generally respond better to treatment than eumycetoma

MYCETOMA

Presentation of Disease

Begins with **Trauma**, then painless subcutaneous firm nodule is observed, with time it develops -> massive swelling with skin rupture, and sinus tract formation , “Usually patients develop 2ndary bacterial infection”

Diagnosis

Clinical samples: Biopsy tissue (Superficial samples of the draining sinuses are inadequate), Pus , Blood (for serology only)

Microscopic Examination

- Histological sections: Hematoxylin-Eosin,
- Smears: Stain with Giemsa , Gomori methenamine silver (Fungi), Stain with Gram (Actinomycetes)
- Grains: Observing the size of the filaments , the color of the grain

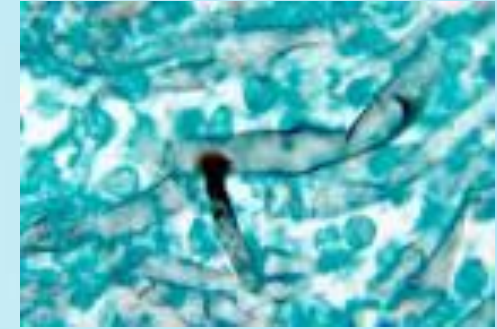
Culture

- Media such as **Sabouraud dextrose agar (SDA)** to isolate fungi, and **Blood agar** to isolate bacteria.
- Fungi are identified based on the macroscopic and microscopic features, for Actinomycetes biochemical and other tests are used for identification

SUBCUTANEOUS ZYGOMYCOSIS

Definition: Chronic localized firm Subcutaneous masses

- ✓ Affects usually facial area or other like hand, arm, leg, thigh.
- ✓ Firm swelling of site with intact skin-Distortion. Direct spread to adjacent bone and tissue.
- ✓ Acquired via traumatic implantation of spores, needle-stick, tattooing, contaminated surgical dressings, burn wound



Etiology

Mould fungi of the
Zygomycetes,
Entomophthorales,
Conidiobolus coronatus,
Basidiobolus ranarum,
and few **mucorales.**

Diagnosis

Sample/Specimen: Biopsy
Tissue

Direct Microscopy: Stained
sections or smears, broad
non-septate hyphae

Culture: on **Sabouraud**
dextrose agar (SDA)

Treatment

Oral Potassium iodide
(KI)
Amphotericin B
Posaconazole

PHAEOHYPHOMYCOSIS

Definition: it's a group of fungal infections caused by dematiaceous (darkly pigmented) fungi widely distributed in the environment.

- ✓ Subcutaneous or brain Abscess
- ✓ Presents as nodules or erythematous plaques with no systemic involvement
- ✓ Affected site: Thigh, legs, feet, arms

Etiology

Dematiaceous mold fungi.

Common: *Cladosporium*,
Exophiala, *Wangiella*,
Cladophialophora,
Bipolaris

You don't have to memorize names

Diagnosis

Specimens: Pus, biopsy tissue

Direct Microscopy: KOH & smears will show brown septate fungal hyphae

Culture: On SDA

Treatment

The treatment of choice is Surgical excision of the lesion

Antifungal (**Itraconazole**,
Posaconazole)

SPOROTRICHOSIS

Definition: Subcutaneous , deep cutaneous or systemic fungal infection

- ✓ Inoculation into the skin
- ✓ Can present as
 1. plaques (subcutaneous nodules)
 2. Lymphanginitic
 3. Dissiminated



Etiology

Sporothrix schenckii.
Dimorphic fungus

Diagnosis

Specimen: Biopsy tissue, pus

Direct Microscopy: smear will show **Finger-like yeast cells**
or
Cigar shaped

Culture: On SDA at room temperature and at 37°C

Treatment

Itraconazole,
Potassium iodide "KI"

Other Subcutaneous Fungal Infections

	Chromoblastomycosis	Rhinosporidiosis	Lobomycosis
Clinical Features	Subcutaneous Verrucous plaques, cauliflower aspect, hyperkeratotic, Ulcerative	Granulomatous, mucocutaneous polyps	Subcutaneous Nodular lesions, keloids
Etiology	Dematiaceous mould fungi	Obligatory parasitic fungus <i>Rhinosporidium seeberi</i>	Obligatory parasitic fungus <i>Lacazia loboi</i>
Clinical Sample	Biopsy Tissue		
Microcopy	Muriform cells (sclerotic bodies)	Spherules with endospores	Chains of yeast cells
Treatment	Surgery + Antifungal therapy	Surgery	

Bone and Joint Infections

- ✓ They are uncommon, not as isolated clinical problem
- ✓ Not as isolated clinical problem
- ✓ **Result from:**
 1. Hematogenous dissemination
 2. Presence of foreign body
 3. Direct inoculation of organism (trauma, surgery , etc)
 4. Spared through direct extension of infection to the bone
- ✓ **Example:** Rhinocerebral zygomycosis, Aspergillosis, mycetoma
- ✓ **Etiology:** *Candida species* & *Aspergillus species* and mould fungi

MCQs:

1.The most common cause of mycetoma in Saudi Arabia is:

- a) *Madurella mycetomatis* b) *Streptomyces somaliensis* c) Zygomycetes

2.What is the fungal infection that is caused by black fungi:

- a) Sporotrichosis b) Chromoblastomycosis c) Phaeohyphomycosis

3..... Needs biochemical tests for identification:

- a) Fungi b) Actinomycetes c) Viruses

4.Actinomycosis is a type of mycetoma that is caused of actinomycetes.

- a)T b)F

5.Eumycetoma is usually localized more than actinomycetoma.

- a)T b)F

A 5
B 4
B 3
C 2
A 1



Good Luck

Done by:

Microbiology team

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