

Lecture 2

Mycetoma and other subcutaneous mycoses

- Additional Notes
- Important
- Explanation
- Examples

OBJECTIVES

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

SUBCUTANEOUS MYCOSES

- It is **fungal** infection involving the dermis, subcutaneous tissues, muscle and may extend to the bone.
- It is initiated by **trauma** to the skin.
- It is difficult to treat “takes years”, **surgeries** are frequently employed.
- It affects healthy host, **HOWEVER** it is more severe in immunocompromised hosts.

- Types of subcutaneous mycoses:
 - ✓ Mycetoma
 - ✓ Subcutaneous zygomycosis
 - ✓ Sporotrichosis
 - ✓ Chromoblastomycosis
 - ✓ Phenoxyphomycosis
 - ✓ Rhinosporidiosis
 - ✓ Lobomycosis

MYCETOMA

- It is a chronic, **granulomatous** disease of the skin and subcutaneous tissue, which sometimes involves muscles and bones.
- It is characterized by swelling, abscess formation, and multiple draining sinuses that exude characteristic grains of clumped organisms. **“grains ONLY in mycetoma”**
- It is endemic in tropical, subtropical, and temperate regions. **“Sudan, Senegal, Somalia, India, Pakistan, Mexico and Venezuela”**
- It is more common in men than women **“ratio is: 3:1”**
- It is common in people who work in rural areas such as **farmers.**
- It is classified into:
 - ✓ Eumycetoma
 - ✓ Actinomycetoma

EUMYCETOMA

- Caused by several mould fungi. Most common:
 - ✓ *Madurella mycetomatis* "common in Saudi Arabia"
 - ✓ *Madurella grisea*
 - ✓ *Pseudallescheria boydii*
- Color of grains: **black** or white
- We use anti fungal agents for treatment such as:
 - ✓ Itraconazole
 - ✓ Ketoconazole
- If patient not responding to medication and bone is involved we use surgical treatment "debridement or amputation"

ACTINOMYCETOMA

- Caused by aerobic filamentous bacteria, gram positive:
 - ✓ *Actinomyces madurae*
 - ✓ *Streptomyces somaliensis*
 - ✓ *Nocardia brasiliensis*
- Color of grains: yellow, white, pinkish
- We use antibiotics for treatment. Usually combination of 2 drugs:
 - ✓ Trimethoprim-sulfamethoxazole
 - ✓ Dapsone
 - ✓ Streptomycin
- Actinomycetoma respond better to treatment than eumycetoma

- Clinical findings are similar for both.
- Eumycetoma are usually more localized than actinomycetoma.
- Actinomycosis is **NOT** mycetoma because it is caused by **anaerobic bacteria**.

- Diagnosis:

- ✓ Clinical samples:

- Biopsy tissue “superficial samples of the draining sinuses”
 - Pus
 - Blood “for serology only”

- ✓ Direct microscopy:

- Microscopic examination of tissue or exudate from the draining sinuses.
 - Grains (Observing the size of the filaments , the color of the grain)

e.g. **White-to-yellow** grains indicate *P . boydii*, *Nocardia species*, or *A. madurae* infection.

Black grains indicate, *Madurella species* infection.

Red-to-pink grains indicate *A . pelletieri* infection.

✓ Culture:

- Sabouraud dextrose agar to isolate fungi.
- Blood agar to isolate bacteria.

✓ Serology:

- Detect the antibodies using culture filtrate or cytoplasmic antigens of mycetoma agents
- Antibodies can be determined by immunodiffusion, enzyme-linked immunosorbent assay

- Fungi are identified based on the macroscopic and microscopic features.
- Actinomycetes needs biochemical and other tests are used for identification.
- Treatment:
 - ✓ Therapy is suggested for several months or years. “1-2 years or more”

SUBCUTANEOUS ZYGOMYCOSES

- It is chronic localized firm subcutaneous masses.
- Appears in facial area, hand, arm, leg and thigh
- Clinical features:
 - ✓ Swelling with intact skin-distortion. It could spread to adjacent bone and tissue.
- Etiology:
 - ✓ Mould fungi of the zygomycetes, *Entomophthorales*.
- Diagnosis: specimen: biopsy tissue
 - ✓ Direct microscopy: stained sections or smears: **broad non-septate hyphae**
 - ✓ Culture: cultured on Sabouraud Dextrose Agar
- Treatment:
 - ✓ Oral potassium iodide (KI)
 - ✓ Amphotericin B
 - ✓ Posaconazole

PHAEOHYPHOMYCOSIS

- It is fungal infection caused by **Dematiaceous mould fungi**. “black fungi”
- Affect thigh, leg, feet and arms
- Clinical feature:
 - ✓ Subcutaneous
 - ✓ Brain abscess
 - ✓ Nodules
 - ✓ Erythematous plaques
- Etiology:
 - ✓ Common mould fungi: **Cladosporium**.
- Diagnosis:
 - ✓ Specimens: Pus, biopsy tissue
 - ✓ Direct microscopy: KOH & smears will show brown septate fungal hyphae
 - ✓ Culture: cultured on Sabouraud Dextrose Agar
- Treatment:
 - ✓ Surgery
 - ✓ Antifungal therapy

OTHER SUBCUTANEOUS FUNGAL INFECTIONS

- Sporotrichosis:

- ✓ Subcutaneous or systemic infection
- ✓ Nodular subcutaneous lesions
- ✓ Verrucous plaques or lymphatic

- Chromoblastomycosis:

- ✓ Subcutaneous verrucous plaques
- ✓ Cauliflower aspect
- ✓ Hyperkeratotic
- ✓ Ulcerative

- Rhinosporidiosis:

- ✓ Granulomatous
- ✓ Mucocutaneous
- ✓ Polyps

- Lobomycosis:

- ✓ Subcutaneous
- ✓ Nodular lesions
- ✓ Keloids

Just go through it !

Quiz

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