



Lecture (4) Mycetoma and other Subcutaneous Mycoses

Objectives

1. Know the main fungi that affects the subcutaneous tissue, muscles and bones and the clinical settings of such infections.
2. Acquire the basic knowledge about the clinical features, diagnosis, and treatment of these infections.



Revision

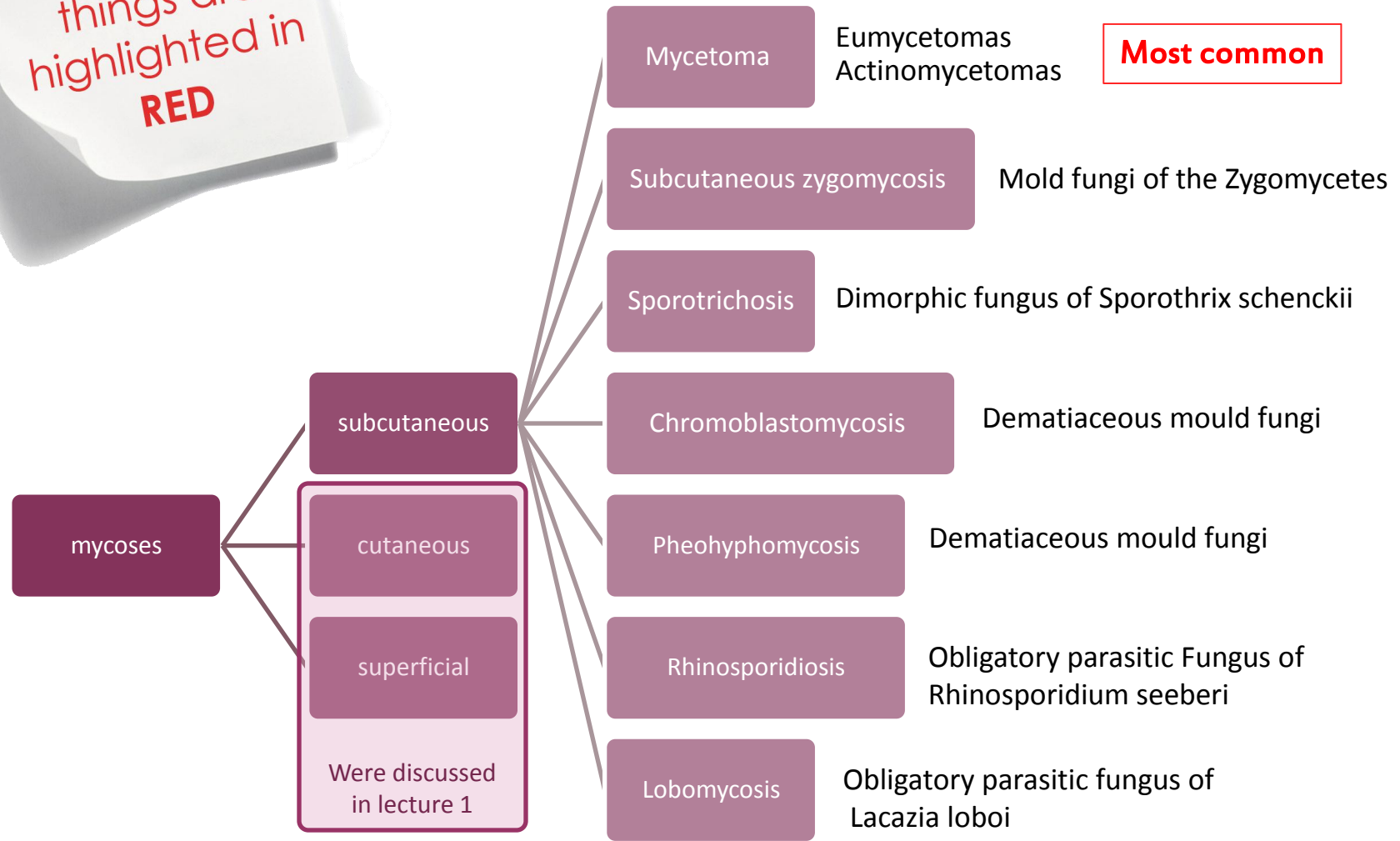
For superficial and cutaneous mycoses

True or False:

1. Superficial mycoses Tinea versicolor causes itching (F)
2. Piedra is an infection of the hair shaft (T)
3. Presence of short hyphae and yeast cells in KOH is diagnostic for Tinea versicolor (T)
4. Dermatophytes are opportunistic pathogens (F)
5. Dermatophytoses can be transmitted from animals to humans (T)
6. Skin and nail infections can be caused by fungi other than dermatophytes (T)
7. Tinea pedis is an infection of the nail caused by dermatophytes (F)
8. Swab is an acceptable sample for diagnosing dermatophytes (F)
9. KOH is usually useful for examining skin, nail and hair samples (T)
10. Oral thrush is an infection of the oral cavity caused by candida (T)
11. Candida is normal flora of skin, gut and oral cavity (T)
12. Shaving the hair will cure Tinea capitis (F)

Mind map

(Subcutaneous Mycoses)

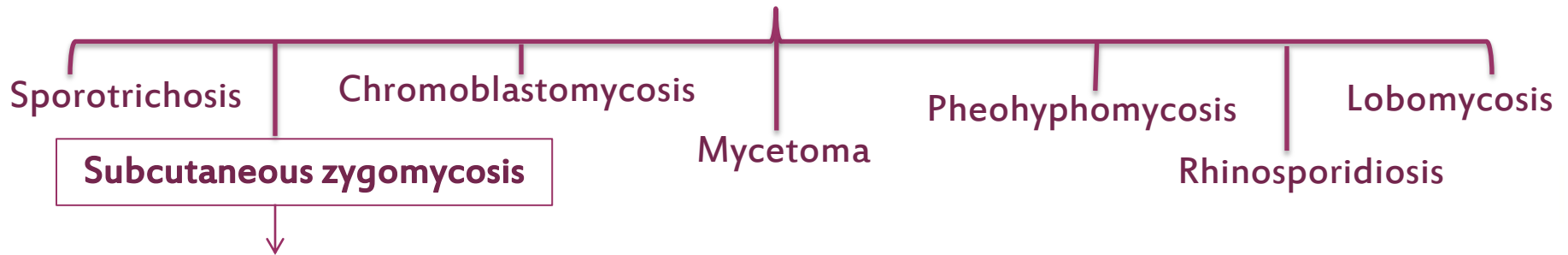


Subcutaneous mycoses



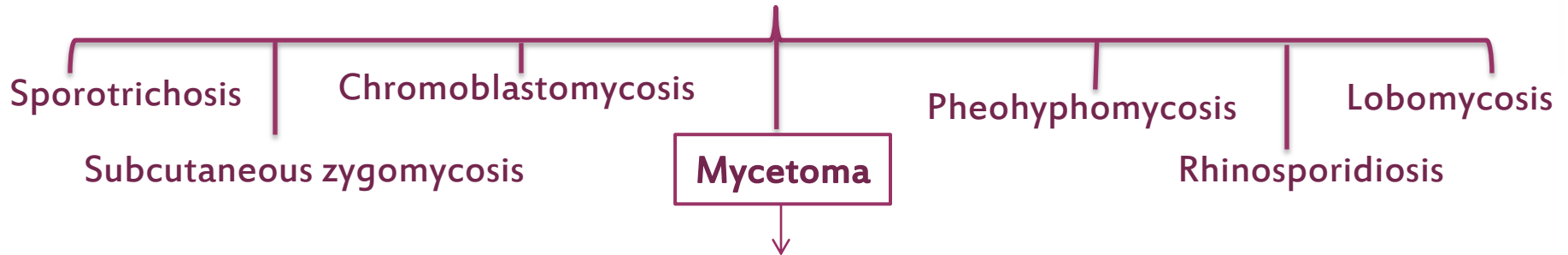
They are initiated by **trauma**, difficult to treat (**surgeries are involved**) and could infect healthy or immunocompromised hosts (more sever in the 2nd)

Example



Description	etiology	Diagnosis	Treatment
<ul style="list-style-type: none"> Chronic, localized, firm masses Appears in: face, hand, arm, leg or thigh swelling with intact skin-Distortion. could spread to adjacent bone and tissue. 	<p>Mold fungi of the Zygomycetes</p>	<p>Specimen: Biopsy tissue</p> <hr/> <p>microscopy: stained sections or smears show broad non-septate hyphae</p> <p>Culture: on <u>SDA</u></p>	<ul style="list-style-type: none"> Oral KI Amphotericin B Posaconazole

Subcutaneous mycoses (Cont.)



Trauma → painless swelling → painless firm nodules (after years) → massive swelling + skin rupture and sinus formation → draining exudate with **grains (also called granules)**

Description

- **Chronic**, granulomatous disease
- Characteristics:
 - swelling
 - Abscess formation
 - Draining sinuses
 - Exudate containing grains
- affects the **lower extremities** (e.g. the disease **madura foot**) hand, back or neck


Epidemiology

- endemic in tropical, subtropical, and temperate regions. E.g. Sudan
- Men > Women
- Common in rural areas workers and **farmers**

Mycetoma (Cont.)

Note:
Superficial samples of the draining sinuses are **inadequate**

Etiology	Diagnosis
<p>Two divisions</p> <p>Eumycetomas</p> <ul style="list-style-type: none"> By: mould fungi Examples: <ol style="list-style-type: none"> Madurella mycetomatis Madurella grisea Pseudallescheria boydii Color of grains: black or white <p>Actinomycetomas</p> <ul style="list-style-type: none"> By: aerobic Actinomycetes (gram +ve, filamentous bacteria) Examples: <ol style="list-style-type: none"> Actinomyadura madurae Streptomyces somaliensis Nocardia brasiliensis Color of grains: yellow, white, brown, pinkish – red 	<p>Specimen: Biopsy tissue, Pus or <u>Blood (for serology only)</u></p> <p>1. microscopy:</p> <p>Two ways</p> <ul style="list-style-type: none"> Of tissue or sinus exudate: <ol style="list-style-type: none"> Histological sections: Stain: Hematoxylin-Eosin Smears: Stain: → Bacteria (Actinomycetomas): Gram stain → Fungi (Eumycetomas): Giemsa , Gomori methenamine silver or periodic acid-Schiff Of grains: observe size & color <p>2. Culture:</p> <ul style="list-style-type: none"> Fungi: SDA medium (identified by: macroscopic & microscopic features) Bacteria: Blood agar (identified by: biochemical features) <p>3. Serology: Detecting the antibodies (by immunodiffusion, , enzyme-linked immunosorbent assay)</p>

 Actinomycetoma is different from Actinomycosis (which is caused by anaerobic Actinomycetes)

Mycetoma (Cont.)

Treatment

Eumycetomas:

1. Ketoconazole
2. Itraconazole
3. Voriconazole
4. Amphotericin B

Actinomycetomas:

Combining 2 of:

1. Trimethoprim-sulfamethoxazole
2. Dapsone
3. Streptomycin

Less responsive compared to actinomycetomas

Therapy should take several **months to 1-2 years**

If the patient is not responsive, (or bone was involved) **surgical treatment is employed for eumycetomas**

Generally (for both types), bone involvement requires Radiologic tests then **amputation**

Other examples of subcutaneous mycoses

	Sporotrichosis	Phaeohyphomycosis	Chromoblastomycosis	Rhinosporidiosis	Lobomycosis
Clinical features	Subcutaneous or systemic infection Nodular subcutaneous lesions, verrucous plaques or Lymphatic	Subcutaneous or brain Abscess Nodules and erythematous plaques	Subcutaneous Verrucous plaques, cauliflower aspect, hyperkeratotic, Ulcerative	Granulomatous, mucocutaneous polyps	Subcutaneous Nodular lesions, keloids
Etiology Skip !	Dimorphic fungus <i>Sporothrix schenckii</i>	Dematiaceous (darkly pigmented) mould fungi	Dematiaceous mould fungi	Obligatory parasitic fungus <i>Rhinosporidium seeberi</i>	Obligatory parasitic fungus <i>Lacazia loboi</i>
Clinical sample	Biopsy tissue	Biopsy tissue	Biopsy tissue	Biopsy tissue	Biopsy tissue
Direct Microscopy	Elongated yeast cells	Brown septate hyphae	Muriform cells (sclerotic bodies)	Spherules with endospores	Chains of yeast cells
Treatment	Potassium iodide (KI) Itraconazole	Surgery (Antifungal therapy)	Surgery (Antifungal therapy)	Surgery	Surgery

Bone and joint infections (uncommon)

Result from

- Hematogenous dissemination
- Presence of foreign body
- Direct inoculation of organism (e.g.: trauma, surgery)
- Spared as a result of direct extension of infection to the bone
e.g.: **most common** : **Aspergillosis, candida**, Rhinocerebral zygomycosis, mycetoma

QUESTIONS

True or False:

1. For Subcutaneous zygomycosis , smears show septate hyphae (**F**)
2. Madura foot is an example of mycetoma, a chronic disease characterized by abscess formation (**T**)
3. Gram is used to stain the smears of Eumycetoma (**F**)
4. Actinomycosis is caused by aerobic actinomycetes (**F**)
5. Direct microscopy for sporotrichosis shows elongated yeast cells (**T**)
6. The polyps formed by Rhinosporidiosis are treated by surgery (**T**)