

UNIVERSIAUTÓNOMA DE SADAD N LUIS POTOSÍ

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LABORATORIO DE MICROBIOLOGÍA

CANDIDA

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GRUPO: 8:00 A 9:00



introduction

- ▶ *Candida albicans* is an asexual and saprophytic diploid fungus, from the Saccharomycete family. It is usually found in the oral cavity, gastrointestinal tract and vagina. It has a relevant role in the digestion of sugars, through a fermentation process.

Taxonomy

Kingdom: fungi

Class: Saccharomycetes

Order: Saccharomycetales

Family: Saccharomycetaceae

Genus: *Candida*

Species: *C. albicans*

Pathologies

- ▶ Can assume pathogenicity, causing candidiasis; In that case, it presents as a vaginal condition (vaginitis), oral cavity (mucus), intestine or skin. It can also cause vaginal yeast infections.
- ▶ In a weakened, immunosuppressed or convalescent body of a long antibiotic cure, *Candida* multiplies in anomalous way, and crosses the intestine, to enter the bloodstream, where it releases its own toxins and causes candidemia.

Genome

- ▶ One of the most interesting facts of the genome of *C. albicans* is the occurrence of numerical and structural chromosomal rearrangements as a means of generating genetic diversity, giving lengths of chromosomes with polymorphism, reciprocal translocations, chromosomal deletions and trisomy of individual chromosomes. These alterations of the karyotype generate changes in the phenotype, which is a strategy of adaptation of this yeast.

Treatments

- ▶ Depending on the extent of the infection and the general condition of the patient, a topical or systemic treatment is decided.
- ▶ Topically, 1% clotrimazole, miconazole, ketoconazole, sertaconazole, terbinafine, or naphthylin may be used.
- ▶ The most frequently used systemic treatments are itraconazole or fluconazole

Clinical case

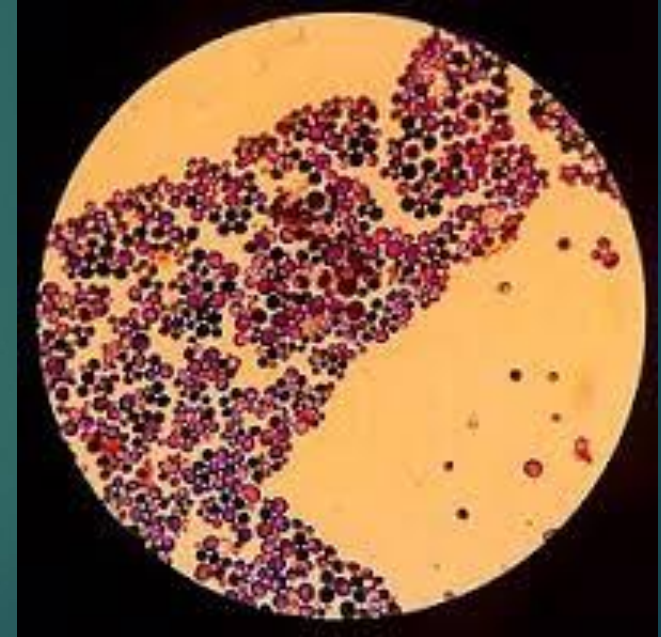
- ▶ A 38-year-old male patient comes to the clinic for a whitish and painful lesion on the tongue, which has occurred in the last 2 months.
- ▶ Relates pain to swallowing.
- ▶ Background of importance: Patient reports weight loss (8 kg) in recent months.

- ▶ Physical examination: Vital functions within normal limits.
- ▶ Skin and mucous membranes: Whitish and confluent plaques on tongue and oral mucosa
- ▶ Laboratory: The wet smear of scraping lesions shows pseudohyphae.



Diagnosis and etiological agent

- ▶ Diagnosis: Mucocutaneous Candidosis (Muguet or milkweed)
- ▶ Etiologic agent: *Candida albicans*



Risk factor's

- ▶ **MECHANICAL FACTORS:** burns, abrasions, local occlusion, humidity and maceration, use of dental prostheses, tight clothing of synthetic material, obesity.
- ▶ **NUTRITIONAL FACTORS:** hypovitaminosis (B1- B2 and A), iron deficiency, malnutrition.
- ▶ **PHYSIOLOGICAL ALTERATIONS:** extreme ages, pregnancy, menstruation.
- ▶ **SYSTEMIC DISEASES:** Down's syndrome, Acrodermatitis enteropática, Diabetes mellitus, other endocrinopathies, uremia, cancer, intrinsic immunodeficiencies, AIDS.
- ▶ **IATROGENIAS:** catheters, e.v. drug use, radiation therapy, chemotherapy, glucocorticoids, broad-spectrum Atb, contraceptives, colchicine and phenylbutazone.

Pathogenicity

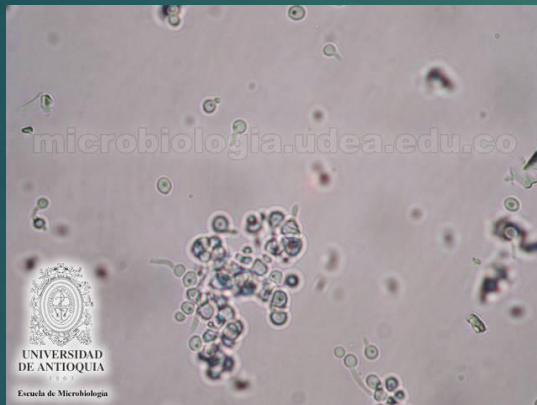
- ▶ The pathogenicity pattern for candidiasis includes adhesion, as well as, multiplication in the mucosal surface, with the consequent filamentation and formation of germinal tubes in the case of *Candida albicans*.
- ▶ This process is followed by the production of phospholipase and proteinase enzymes, which produce tissue damage, penetrate and elicit an inflammatory response in the underlying tissue.
- ▶ This must end in a systemic colonization that depends on the host's immune status and the microbial ability to proliferate and alter its immediate environment, under these conditions, damage to host tissues spreads and establishes an infectious disease domain.

Tests to confirm the diagnosis

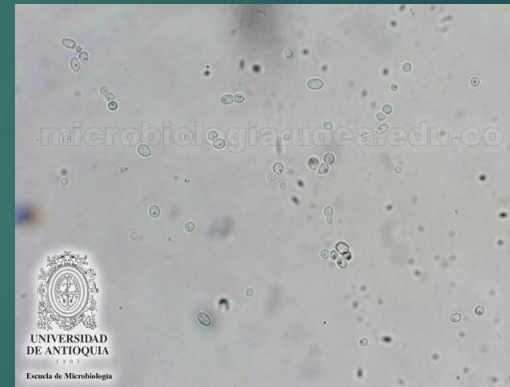
- ▶ The clinical diagnosis of candidiasis should be confirmed by laboratory tests to identify the species of yeast involved.
- ▶ To definitively prove the infection you need:
 - ▶ 1- Clinical evaluation of the patient.
 - ▶ 2- Direct microscopic examination (in fresh).
 - ▶ 3- Culture on Sabouraud agar.
 - ▶ 4- Suspension of yeast in human serum, incubating at 37 C and observing it under an optical microscope every half hour:
 - ▶ A- If "filamentation", ie the formation of "germinative tubes", is a diagnosis of *Candida albicans*.
 - ▶ B- If the germ tube is not formed, it is reported: "A yeast other than *Candida albicans* is isolated."

Biochemical tests

- ▶ 1. Germinal Tube: It is a useful test to differentiate *C. albicans* / *C.dubliniensis* from *Candida NO.*



Control positivo

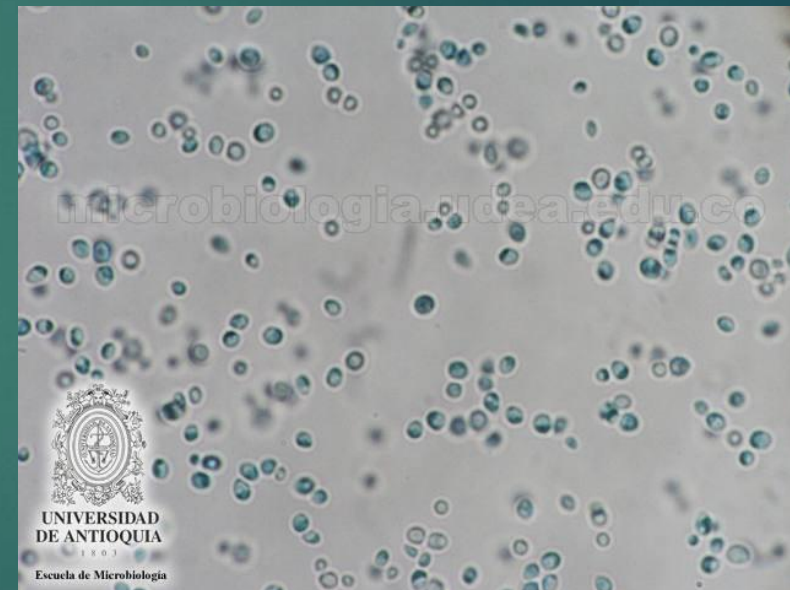


Control negativo

- ▶ **2. Formation of Chlamydoconidia:** This test is performed in poor environments such as cornmeal, carrot potato, casein agar, tomato agar, tobacco agar, among others. Chlamydoconidias are resistance forms, round or oval, 6-12 μm in diameter and Thick wall, spore-like, present in the pseudohifas. They can be lateral or terminal, in accumulations, pairs or triplets.



Control positivo



Control negativo

- ▶ **Chromogenic agar for Candida spp .:** Chromogenic agar is selective and commercially available differential media. Based on glucose and peptone, selectivity is given by chloramphenicol, it contains a mixture of chromogenic substrates which release different colored components when degraded by specific enzymes produced by certain Candida species.
- ▶ **C. albicans** (light green), **C. dubliniensis** (dark green), **C. tropicalis** (dark blue), **C. krusei** (pale violet), **C. glabrata** (intense violet), other species of **Candida spp.** (White-cream), **Trichosporon spp.** (Blue-gray) and **Geotrichum spp.** (Violet).



- ▶ 4. Growth in Sabouraud with 6.5% sodium chloride: This test is performed in order to determine the growth capacity of *Candida albicans* in a hypertonic Sabouraud medium incubated at room temperature (25 ° C), unlike *C. dubliniensis* Which does not grow at these salt concentrations
- ▶ 5. Assimilation profile of sugars: are based on utilization (auxonogram) of carbohydrates. It is made from differentiated colonies of 24 h growth, using commercial identification systems such as API 20C AUX (manual method) or Vitek System (automated method, bioMerieux, France). Each species of *Candida* has a biochemical profile that identifies it.



TREATMENT

- ▶ The treatment of candidiasis is based on four pillars:
- ▶ Carry out an early and accurate diagnosis of the infection.
- ▶ Correction of facilitating factors or underlying diseases.
- ▶ Determination of the type of candidiasis infection.
- ▶ Use of appropriate antifungal drugs.
- ▶ Itraconazole 100 mg orally, once a day, for two months, and ☐
- ▶ Nystatin 1 000 000 U / ml orally, 4 times daily until skin and oral lesions were resolved.

BIBLIOGRAPHY

- ▶ <https://es.slideshare.net/BrendaAuroraTafurHoyos/casos-clinicos-de-hongos>
- ▶ <http://aprendeonline.udea.edu.co/lms/moodle/mod/page/view.php?id=100778>