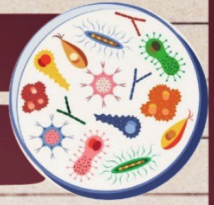


Hope academic team

genitourinary system



Microbiology

Lecture : 4

Done by : Taha obaid



**This lecture is related to
infection of genitourinary
system and not related to
sexual transmitted infection**

Genito-Urinary System

حنكبي بهاي المحاضرة عن ال
candidiasis و بالشكل الرئيسي عن ال
candida albicans

غالبا هاد النوع من المايكروبات ما بنشوفه
بالمستشفيات انما يكون بالعيادات و غالبا
يكون mild infection

Candidiasis & Candida albicans

■ The candida

Candida is considered as part of our normal flora



و هاد يعني الاصابه بهاد المرض هو
بكون نتيجة opportunistic infection
و غالبا بتكون لل immune
compromised patient

- members of the resident human
- can produce disease ranging from superficial skin or mucous membrane infections to systemic involvement of multiple organs.

هاد المرض ممكن يكون خفيف و اعراضه خفيفة و ممكن يكون sever و يدخل الى الدم و يعمل sever illness يعني ممكن هاد المايكروب يكون بالناس ال healthy و ممكن يكون mild و ممكن يكون sever

في عنا انواع كثير من ال candida و تقريبا اكثر من ١٢ وحدة
منهم ممكن تعمل infection to human لكن ال most
common هي ال candida albicans

- The most common opportunistic infections are caused by the yeast *Candida albicans*
 - a common inhabitant of the ^(A)gastrointestinal and ^(B)genital floras

Candida albicans

- *C. albicans* grows in multiple morphologic forms

بنعید انه ال candida هي opportunistic infection لو قلت ما رح تكون harmless
لكن اذا صار في عنا مشكلة بال immune system ممكن انه تزيد ال candida و هاد
بعمل candida overgrowth و هاد رح يؤدي الى ال infection

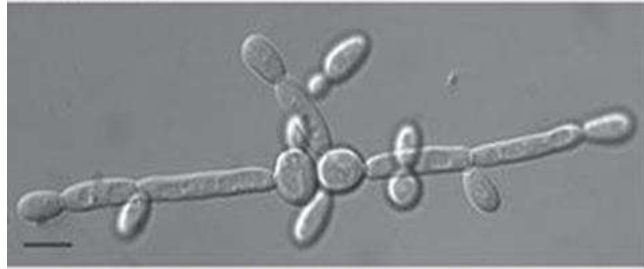
هذول الشكلين بظهورا deferant protein profile و بعطوا خلايا عندها مميزات مختلفه يعني هون عنا التغيير مش بس بالشكل انما بال protein production

يعني مثلا ال round shape عندها قدرة اكبر على الانتقال من مكان لآخر داخل الجسم

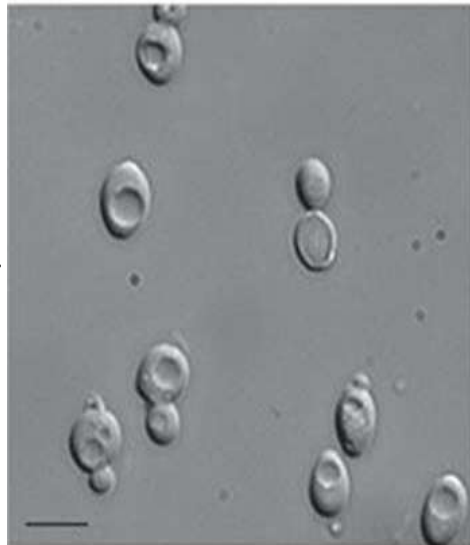
بينما ال filamentous shape هاد احسن بال invading the tissue

عملية التحول ما بين ال oval shape to hyphae shape بتعتمد على ال environmental conditions مثل ال nutrition ال -3 pH ال -2 الحرارة

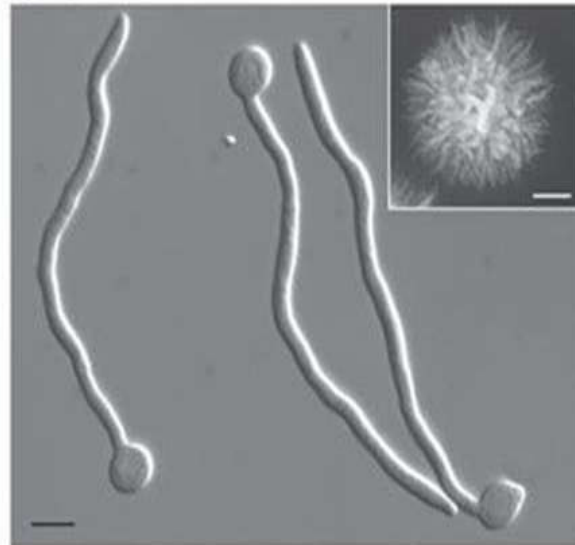
Pseudohyphae



Yeast



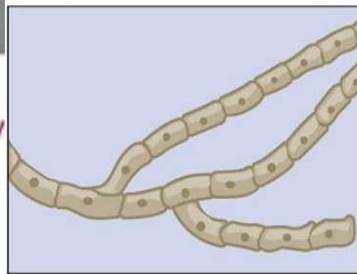
Hyphae



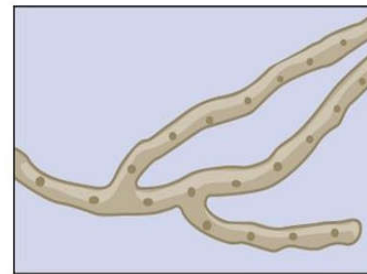
Some candida species can appear like sedimental shape called sedimental Hyphae

حتى من ال hyphae عنا نوعين النوع الاول هو ال septate hyphae اللي بكون فيه ال septum لكن ال cytoplasm بكون continues مش مفصول النوع الثاني بكون coenocytic hyphae

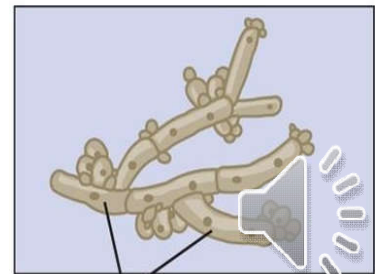
septate hyphae



coenocytic (nonseptate) hyphae



pseudohyphae



molds

yeast cells

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Candida can take round or oval shape

(A)

■ The *C. albicans* cell wall is made up of:

بدنا نعرف انه هي بتكون من انواع
مختلفه من ال polysaccharides
و شو هي هاي الانواع بالاضافة
عن انه يكون بس
polysaccharides او بتكون
complex مع protein

– a mixture of the polysaccharides mannan, glucan, and chitin alone or in complexes with protein.

– The exact composition of the cell wall and surface components varies under different growth and morphologic conditions.

CANDIDIASIS

بالنسبة الى ال **localized infection** قلنا انه ال candida بالطبيعي بتكون بال skin membrane وهي اصلا جزء من ال flora تبعا و لما يبدا يصير فيها overgrowth بتبدا تعمل damage للاجزاء اللي جنبها

① mild

■ Candidiasis occurs in **localized** and **disseminated** forms.

② النقطة تحت
تابعين لها
النوع

– Deep tissue and disseminated disease are limited almost exclusively to the **immuno-compromised**.

– Diffuse **pneumonia** and **urinary tract** involvement are especially common.

ال most common form of this infection هو يسمى ال pseudomembranus candidasis و اللي هي بتكون نتيجة weakened of immune system و اللي بسمح لل candida انه يصير فيها over growth

النتيجة انه صار في تدمير لل stratified squamous epithelium ال هو ال outer layer form للجلد و هاد بعمل accumulation of destroyed cell و ال keratin protein بتكون بال outer layer و هاد بعمل white lesions يسمى pseudomembrane

هاد ال white Lesions ما يكون painful

بالنسبة لل localized قلنا هو يكون نتيجة ضعف بجهاز المناعة لهيك يكون منتشر اكثر ما بين هذول الناس: الاطفال / كبار السن / immune suppressant condition

اما ال disseminated يكون عنا chronic stage of immune system

EPIDEMIOLOGY

- *C. albicans* is a common member of the oropharyngeal, gastrointestinal, and female genital flora (30-50% of healthy person).
- Infections are ^{يعني من الشخص نفسه} endogenous except in cases of direct mucosal contact with lesions in others (eg, through sexual intercourse). In this condition may be exogenous
- Although *C. albicans* is a common cause of nosocomial infections, the fungi are also derived more frequently from the patient's own flora.

مع هاي الاجهزة ال candida بنعمل تجمعات
من ال candida albicans و بتتغطى ب geli
و بتشتغل مثل ال like matrix of protein
و حتى نعالج هاد المريض لازم
نشيل هاد الجهاز اللي انحط

يعني مثلا ممكن في بعض العمليات لما
نحط prostatic devise او valve او
حتى joint من هاي الاجهزة اللي بتنحط
داخل الجسم ممكن تكون risk factors
of developing candidiasis

- Invasive procedures and **indwelling devices** may provide portal of entry,
- the number of Candida may be enhanced by the use of antibacterial agents.

و برضو الناس اللي بتاخذ ال
antibacterial agent هذول يعطو
ال candida مجال اكبر انه تتكاثر و
هاد بيزيد ال risk of infection

PATHOGENESIS

- Because *C. albicans* is regularly present on mucosal surfaces, disease implies a change in the ^①organism, the ^②host, or both.
- Shift from yeast to hyphae is associated with enhanced pathogenic potential of *C. albicans* (invasion).

PATHOGENESIS

- *C. albicans* hyphae have the capacity to form strong attachments to human epithelial cells, So now it able to invade
mediated by a surface mannoproteins; hyphal wall protein (Hwp1) found only on surface of germ tubes and hyphae & extracellular matrix.

آخر 3 أسطر الدكتور
ها شرح



■ Hyphae

This enzyme that able to digest protein & epithelial cell

- secrete proteinases and phospholipases that are able to digest epithelial cells and facilitate invasion.

ما طلبه طاي النقطة
■ *C. albicans* has protein surface receptors that bind the C3 component of complement in an antiopsonic manner.

MANIFESTATIONS

- Superficial invasion of the m. membranes produces a usually **painless, white, cheesy plaque** called **thrush** that is **loosely adherent to the mucosal surface.**

This thrush cause
creamy white lesson
و يتكون باللسان او
بسقف الحلق مرات

This called oral
thrush or oral
candidiasis



Is the most
important
manifestation



MANIFESTATIONS

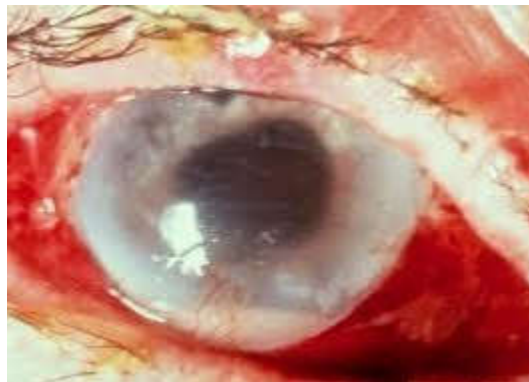
This infection is fungal infection that cause irritation and cause 1 + 2

- Vaginal candidiasis (vulvovaginitis) produces a thick, curd-like discharge and itching of the vulva. Vaginitis may be recurrent.



- Chronic mucocutaneous candidiasis is associated with specific T-cell defects.
- Inflammatory patches similar to thrush may develop in the esophagus and intestine with or without associated oral candidiasis.
 - Painful swallowing and substernal chest pain are the most common symptoms

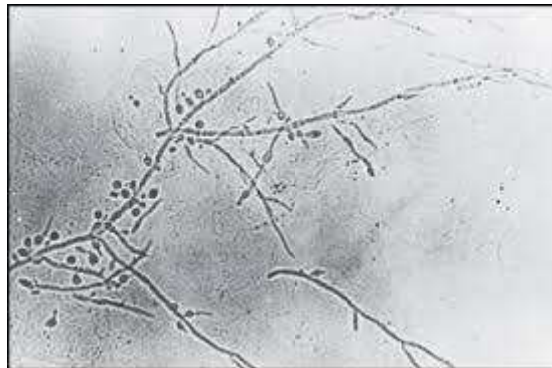
- Urinary tract infections are ascending or hematogenous may produce cystitis, pyelonephritis, abscesses, or expanding fungus ball lesions in the renal pelvis.
- Endophthalmitis appears as white cotton on the retina. Endophthalmitis and infections of other eye structures can lead to blindness.



Do a destruction of all other type of tissue except the fungal tissue a seen directly under microscope

DIAGNOSIS

- ① ■ **KOH and Gram smears** of superficial lesions show **budding yeast** and **hyphae**.
- ② ■ **Cultures** from specimens such as sputum run the risk of contamination from the normal flora or a superficial mucous membrane lesion.
- ③ ■ **Lung involvement** requires a direct aspirate, biopsy, or bronchoalveolar lavage.



DIAGNOSIS

④

- Deep organ involvement is difficult to prove without a direct aspirate or biopsy.
- Immunodiagnostic procedures are not routine.

⑤

TREATMENT it depend on area affected

in general

C. albicans is usually susceptible to:

- **nystatin**, **amphotericin B**, **flucytosine**, and the **azoles**.

In case of esophagitis may use oral anti fungal like fluconazole

Topical **nystatin** or **azoles** generally used for the treatment of **superficial lesions**.

TREATMENT

- Deeper infections may resolve spontaneously with elimination or control of predisposing conditions, as an infected catheter or control of diabetes.
↳ by remove it
- Amphotericin B, flucytosine, and azoles for invasive disease