Oral mycotic infections

DEPARTMENT OF ORAL AND MAXILLOFACIAL PATHOLOGY & ORAL MICROBIOLOGY

ORAL FUNGAL DISEASES

- CANDIDIASIS
- HISTOPLASMOSIS
- ZYGOMYCOSIS/MUCORMYCOSIS
- RHINO-CEREBRAL MUCORMYCOSIS
- RHINOSPORODIOSIS
- NORTH AMERICAN BLASTOMYCOSIS
- SOUTH AMERICAN BLASTOMYCOSIS
- COCCIDIODOMYCOSIS
- CRYPTOCOCCOSIS

Candidiasis

- Caused by yeast like fungus Candida albicans
- Other names- moniliasis, thrush, candidosis
- C.albicans show dimorphism- yeast form and hypal form
- Most common fungal infection of the oral cavity
- More than 50% of people carry this organism without symptoms
- Three factors determine candida infection – the immune status of the host, the oral mucosal environment, strain of C.albicans

Clinical types

- Pseudomembranous
- Erythematous
- Median rhomboid glossitis
- Chronic multifocal
- Angular cheilitis
- Denture stomatitis
- Hyperplastic/ candidal leukoplakia
- Mucocutaneous
- Endocrine –candidiasis syndrome

Pseudomembranous candidiasis

- Most common form also known as Thrush
- Presence of white plaques resembling cottage cheese or curds on the oral mucosa
- Scraping these masses will remove them leaving the underlying base erythematous
- If bleeds after scraping, then might be lichen Planus or cancer chemotherapy
- Causes : 1. broad spectrum antibiotics
  2. immune dysfunction
  3. HIV
  4. infants
  5. uncontrolled diabetes

Erythematous candidiasis

- Don’t show white flecks as a prominent feature
- Several forms are seen : 1. Acute atrophic candidiasis
  2. Central papillary atrophy/median rhomboid glossitis
  3. Angular chelitis
- Acute atophic candidiasis follows a course of broad spectrum of antibiotics so sometimes called as ‘antibiotic sore mouth’
- Burning sensation and baldness of tongue to various degrees due to loss of filliform papillae with metallic taste.

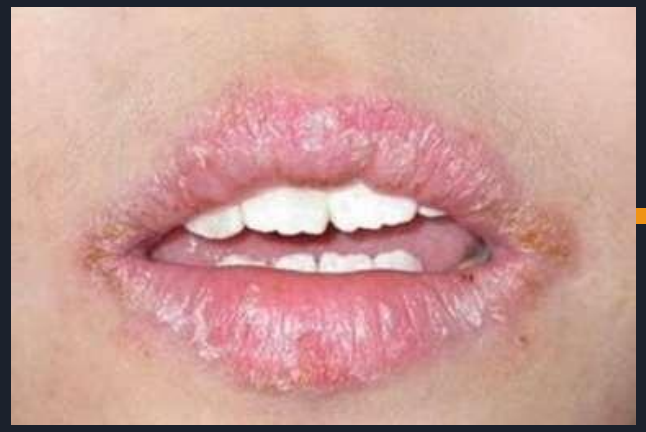
Central papillary atrophy / median rhomboid glossitis

- In the past this was known as developmental defect of tongue
- Asymptomatic erythematous lesion affecting the midline on the posterior dorsum of the tongue
- Erythema is due to loss of filliform papillae
- Symmetrical lesion
- After few days or along with this lesion palatal lesions also do appear or seen, this is due to resting of the tongue against the palate. ---- kissing lesion

Kissing Lesion

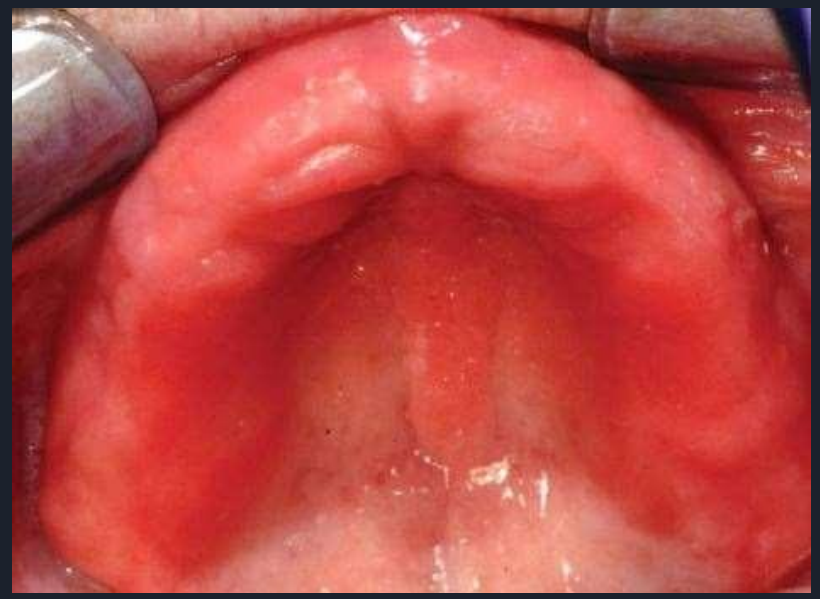
Angular cheilitis

- Lesion of the corner of the mouth
- Loss of vertical dimension of occlusion in adults lead to folds at the corners of the mouth and pooling of saliva in that areas favoring the growth of the fungus
- Sometimes due to habitual lip sucking candida may infect the perioral skin all around the mouth and called as cheilocandidiasis.



Cheilocandidiasis

Denture stomatitis



- Type of erythematous candidiasis
- Localized to denture bearing areas
- Patient don’t maintain denture hygiene and removes it rarely for cleaning
- These dentures show heavy colonization of candida organisms than the dentures of patients without erythema

Chronic hyperplastic candidiasis / candidal leukoplakia

- In some patients with candidiasis there may be a white patch that cannot be removed by scrapping – candida leukoplakia or chronic hyperplastic candidiasis
- Sometimes this is due to superimposition of candidiasis on pre-existing leukoplakia
- Sometimes the candida leukoplakia is seen as mixed red and white areas resulting in speckled leukoplakia
- This speckled leukoplakia has high malignant transformation rate due to high degrees of epithelial dysplasia

Muco-cutaneous candidiasis

- Associated with immunological disorders
- Sometimes run in families with certain autosomal recessive disorders
- Severity correlates with the severity of immunological defect
- Involves mouth, nails, skin and other mucosal surfaces
- Oral lesion resemble chronic hyperplastic candidiasis and cannot be rubbed off easily.


(A)
(B)
(C)

Endocrine candidiasis syndrome

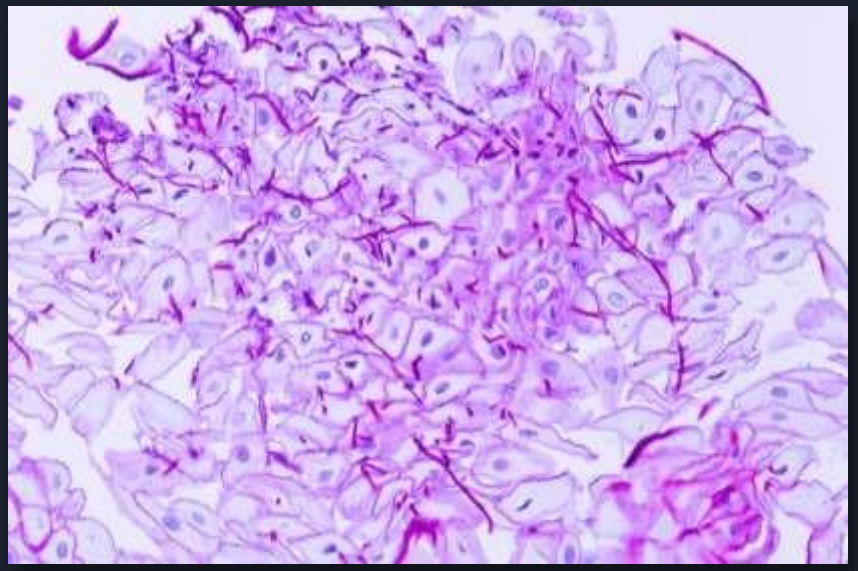
- Associated with hypoparathyroidism, diabetes mellitus iron-deficiency anemia, hypothyroidism, hypoadrenocorticism (Addison's disease),
- Candidal infection remains superficial and can be controlled by antifungal medications

Histopathology –PAS staining

PAS- per iodic acid schiff staining of exfoliative cytology specimen or tissue section

PAS method stains carbohydrates in the fungal cell and makes the fungus readily visible in bright magenta color

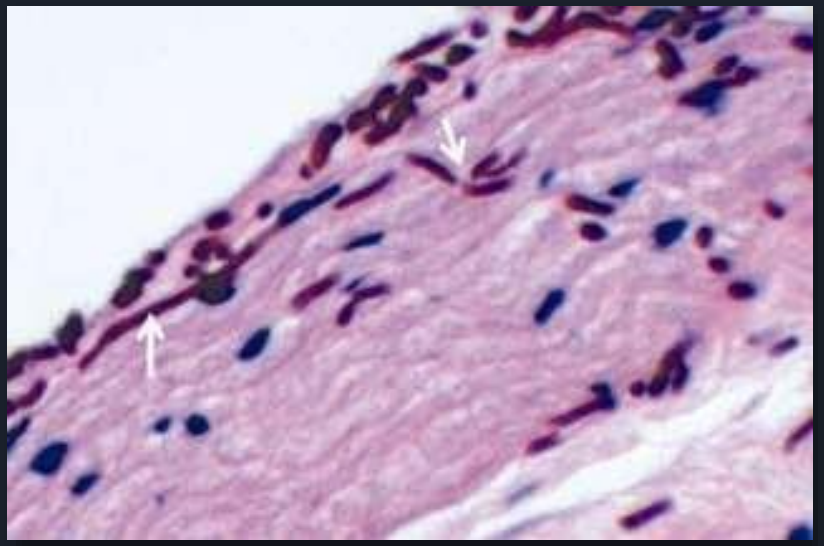
Appears as tangled mass of hypae, yeast and desquamated epithelial cells with inflammatory cells



Tissue sections –PAS staining

The specimen is usually submitted in case of chronic hyperplastic candidiasis

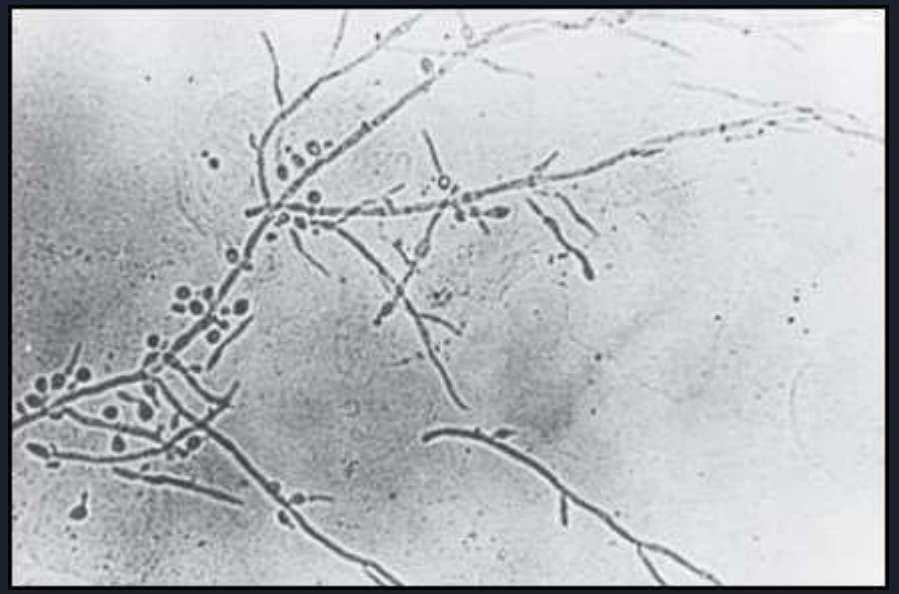
Shows candida hypae in superficial parakeratin layer or sometimes in spinous cell layer .deep penetration is rarely seen , if seen indicates that the patient is severely immune compromised



KOH 10% to 20%

KOH lyses the background epithelial cells and makes hyphae and yeast visible

But do not offer any stain to the cells



Laboratory diagnosis

- PAS preparation of exfoliative cytology specimen or tissue sections
- KOH preparation
- Culture of the organism in Sabouraud's agar slant
- Latest techniques include PCR, ELISA, TISSUE ARRAY & MICROCHIP

TREATMENT

- Topically or systematic
- 7 days treatment
- Oral symptoms disappears in 2-5 days
- Relapse common – underlying immunodeficiency
- Removal of causative factors
    - Ill fitting denture
    - Withdrawal or change of antibiotics
    - Proper cleaning of denture and use of antifungal agent

Topical

- Nystatin
- -2,00,000 unit Oral pastille -5 times a day -dissolved in mouth
- -1,00,000 unit oral suspension -5 times a day -oral rinse in 20 ml of water

- •AmphotericinB
- -0.1 mg/ml, 5-10 ml oral rinse and expectorated -tds
- -Elixir containing tetracycline and amphotericinB - **acute atrophic candidiasis**

- -Triamcinolene+ Nystatin-**angular cheilitis**

Topical treatment

- Preferred – less systemic absorption
- Effectiveness depends –entirely on patient compliance

- Clotrimazole- antibacterial as well as antifungal property

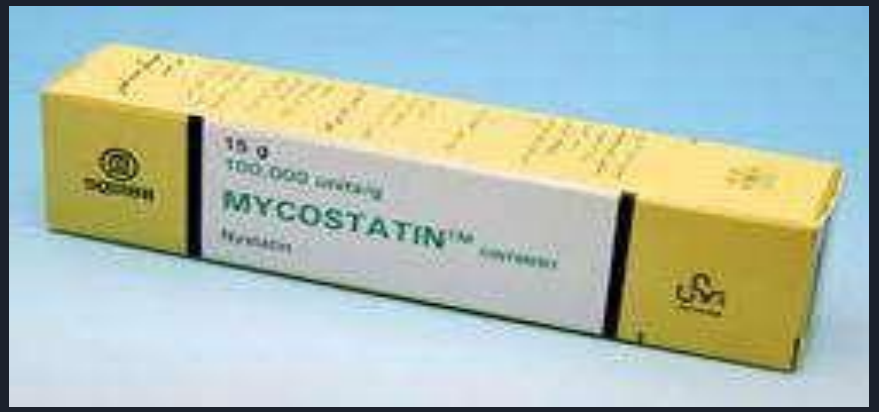
- Oral application is available as mouth paint

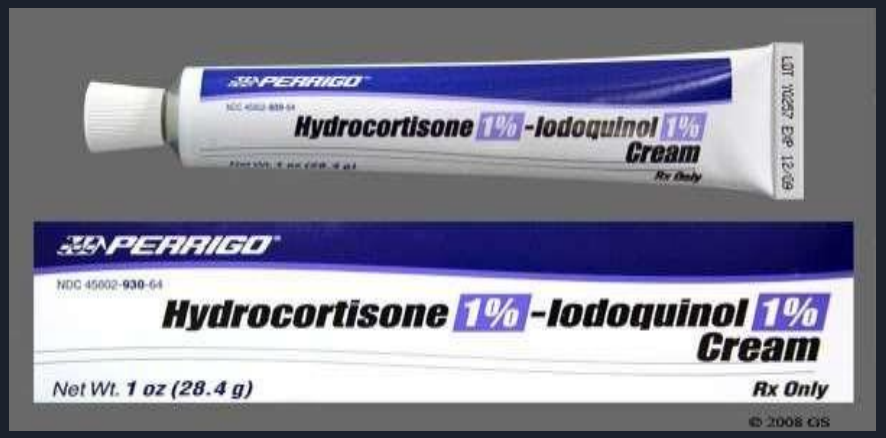
- Cream form can be applied on perioral regions as well as other affected areas.

- 1% genitian violet
- Not ideal – causes unaesthetic staining

Topical

- Mycostatin cream
- -1,00,000 placed under tongue -tds
- -Oral rinse -tds
- -Adsorbable corticosteroid and antibiotic agent
  + mycostatin cream -accelerates symptomatic relief





- •Idoquinol
- -Antifungal and antibacterial property
- -Combined with corticosteroid -effective

Systemic treatment

- Nystatin
- –250 mg tds–2 week followed by 1 troche per day for 3rdweek

- Ketaconazole
- –200 mg tab with food, OD
- –Liver side effect –so continuous monitoring needed in long term dose.
- –Acidic environment for absorption

Systemic

- Itraconazole
- -100/200 mg capsule -b.d. for 2 week

- Fluconazole
- -100 mg -o.d. for 2 week
- -Effective prophylactic agent

Latest drugs

- Fluconazole oral rinses

- Luliconazole

Histoplasmosis

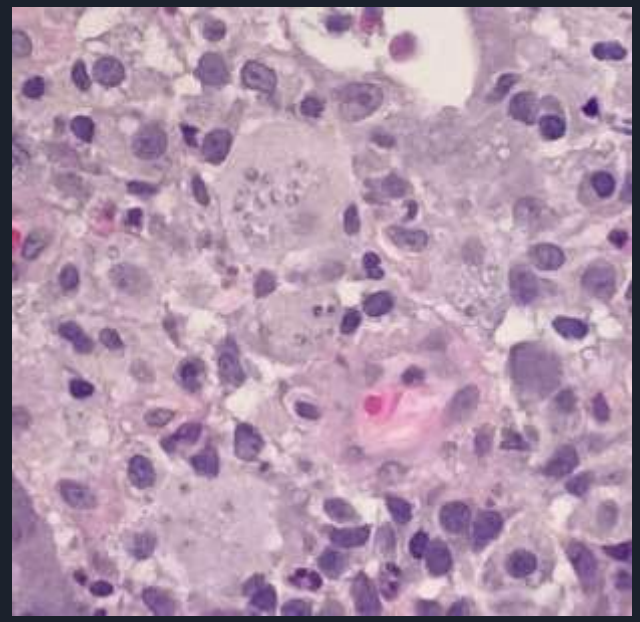
- Most common systemic fungal infection in USA.
- Histoplasmosis is endemic in certain geographical regions of India including Assam, Bihar, Delhi, Haryana, Punjab, Uttar Pradesh and West Bengal
- Caused by Histoplasma capsulatum
- Dimorphic fungi
- Common in humid areas contaminated by bird or bat excreta
- So can be seen in river bed areas.
- Airbourne
- Infection severity depends on quantity of spores inhaled, immune status of the host and strain of H.capsulatum

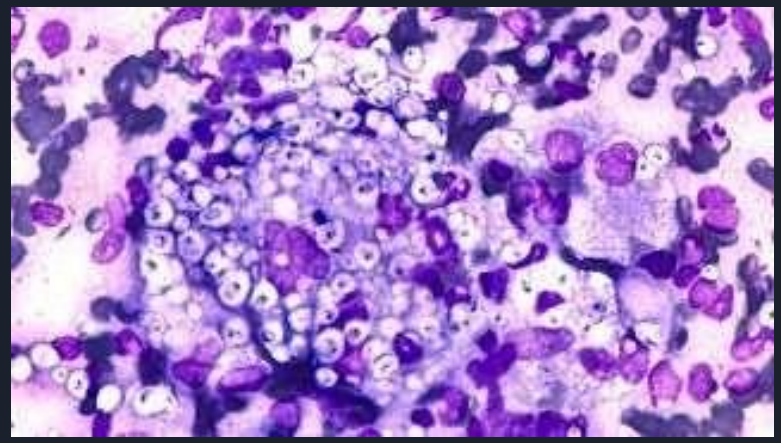
Features

- Most of the people are asymptomatic , and few may develop flu like symptoms for one or two weeks and later they develop antibodies and subsequently immunity.
- 1% people show pulmonary infection similar to that of influenza and heal without complications . This is called as acute histoplasmosis
- Chronic histoplasmosis affects elders and severe immunecompromised individuals and shows symptoms similar to tuberculosis
- Another form called as disseminated form shows oral symptoms. Usually associated with AIDS.
- Oral lesions appear as solitary ulcers with irregular surface, rolled borders similar to oral cancer.

Diagnosis

- Made by histopathological examination and finding of organism in tissue sections.
- Isolation by organism culture
- Serological testing





Treatment

- Acute histoplasmosis do not require treatment.
- Chronic histoplasmosis require avoid pulmonary treatment to damage and death.
- IV amphotericin B is the drug of choice but contradicted in patients with kidney problems, ketoconazole or itraconazole can be used
- Disseminated histoplasmosis is fatal and kills 90% of the people. Amphotericin B is indicated in such patients

Zygomycosis /Phytomycosis /Mucormycosis

- Mucormycosis (also called zygomycosis) is a rare infection caused by organisms that belong to a group of fungi called Mucoromycotina.
- At one time these fungi werecalled Zygomycota, but this scientific name has recently been changed.
- These fungi are typically found in the soil and in association with decaying organic matter, such as leaves, compost piles or rotten wood.

- Mucormycosis is a rare infection.
- The infection is more common among people with weakened immune systems, but it can occur (rarely) in people who are otherwise healthy.

- Risk factors for developing mucormycosis include:
    a. Uncontrolled diabetes
    b. Cancer
    c. Organ transplant
    d. Neutropenia (low white blood cells)
    e. Skin trauma (cuts, scrapes, punctures, or burns)

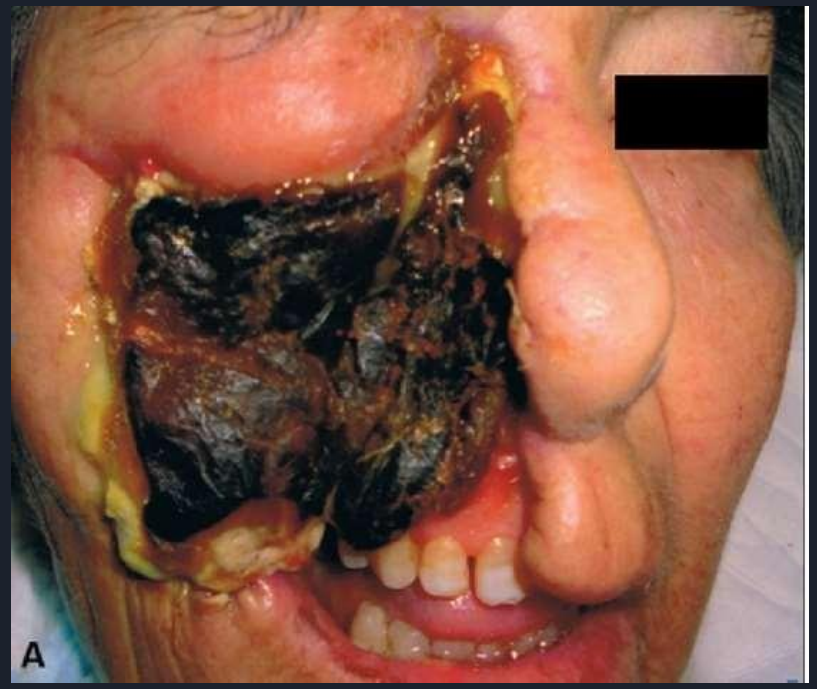
- Mucormycosis is not contagious and does not spread from person to person.

Types

Clinical type	Underlying condition
Rhino-cerebral	Diabetes, ketoacidosis
Pulmonary	Neutropenia, corticosteroid therapy
Cutaneous	Trauma, diabetes
Gastrointestinal	Malnutrition
Disseminated disease	Deferoxamine, neutropenia, corticosteroids
Other (central nervous system, endocarditis, etc.)	Various

Rhino-cerebral mucormycosis

- Most relevant form and shows oral manifestations
- Noted commonly in insulin dependent diabetics with uncontrolled diabetes and ketoacidosis
- Maxillary sinus involvement is common
- Symptoms include : bloody nasal discharge, nasal obstruction, facial pain, headache, cellulitis and visual disturbances
- With progression involves cranial vault and results in seizures, blindness and finally death.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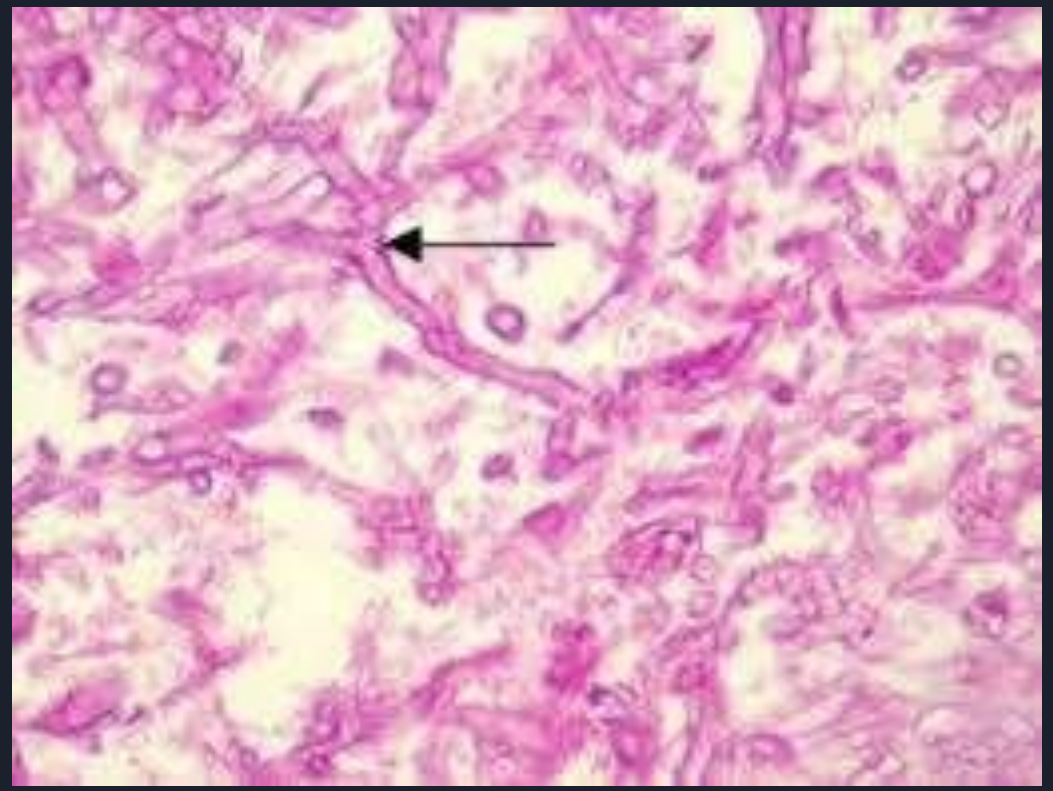
Histopathology

Culture



Treatment

- Radical surgical debridement of infected and necrotic tissue
- Control of underlying disease
- High doses of amphotericin B
- Maxillo facial prosthesis including palatal obturators

Rhinosporodiosis

- Rhinosporidiosis is a granulomatous disease affecting the mucous membrane of nasopharynx, oropharynx, conjunctiva, rectum and external genitalia.

- This organism was previously considered to be a fungus, and rhinosporidiosis is classified as a fungal disease. It is now considered to be a protist classified under Mesomycetozoea.

Diagnosis

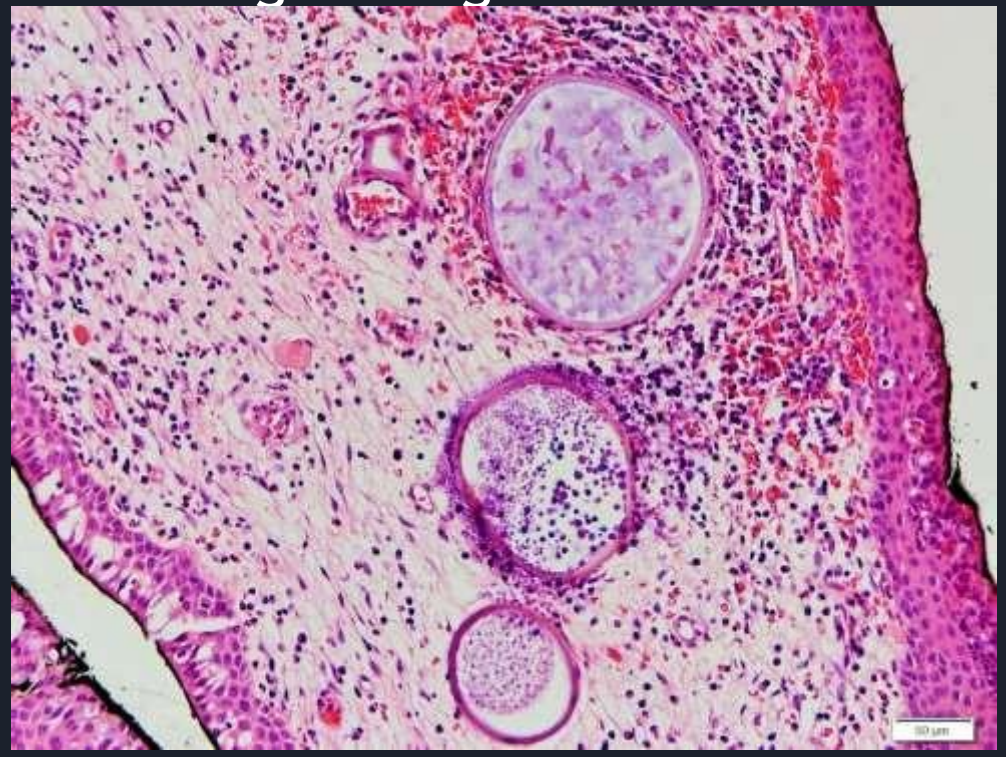
- History
  - Unilateral nasal obstruction
  - Epistaxis
  - Local pruritus
  - Rhinorrhea
  - Coryza (rhinitis) with sneezing
  - Post nasal discharge with cough
  - Foreign body sensation
  - History of exposure to contaminated water
  - Increased tearing and photo phobia in cases of infection of palpebral conjunctiva

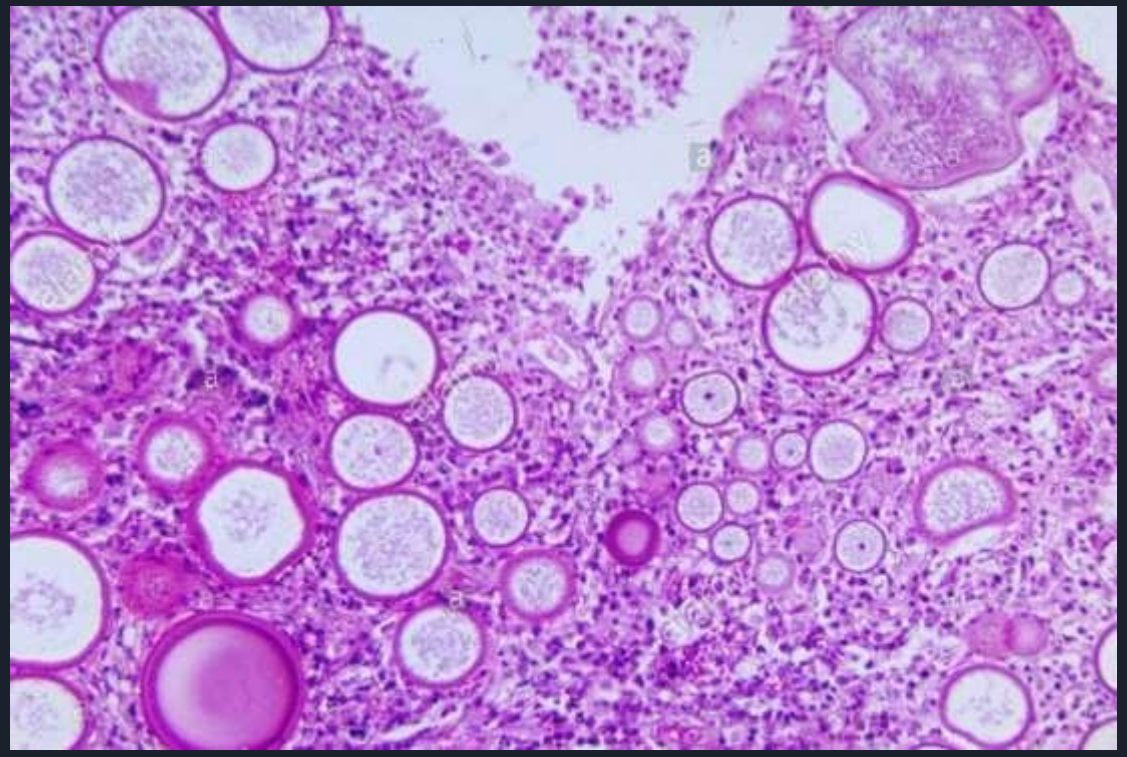
- On examination
  - Pink to deep red polyps
  - Strawberry like appearance
  - Bleeds easily upon manipulation

Clinical picture

Histopathology

- several round or oval sporangia and spores which may be seen bursting through its chitinous wall





Treatment

- Surgical excision - wide excision with wide area electro-coagulation of the lesion base

- Medical treatment is not so effective but treatment with a year-long course of dapsone

North American Blastomycosis (Gilchrist's disease)

- *Blastomyces dermatitidis*- causes blastomycosis
- Free-living species distributed in soil of a large section of the north U.S.
- Inhaled 10-100 conidia convert to yeasts and multiply in lungs.
- Affects mainly lungs and nearly 50% of those infected show cough and fever or no symptom.
- It may spread to other parts of the body, skin is involved in 20% to 40% of cases.

Cutaneous features

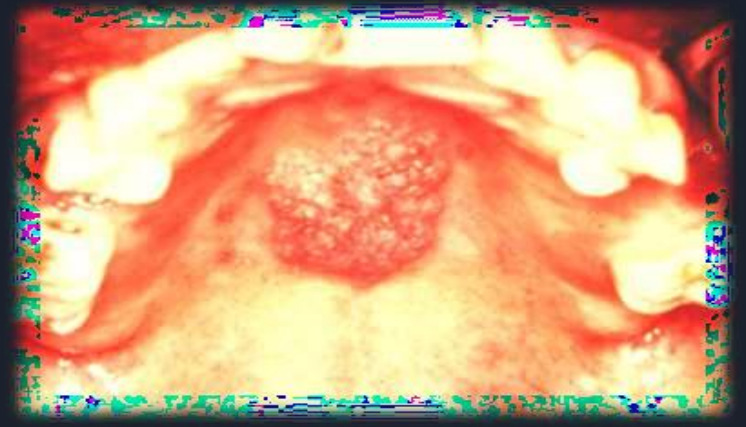
- Skin lesions are common on the face, neck and the extremities as the infection spreads from the lungs to other parts of the body.

- Lesions begin as papules, pustules or as subcutaneous nodule. Within weeks to months, the lesions develop into ulcers and form crusty sores.

- Clinically, the chronic, non healing oral ulcers may resemble those of epidermoid carcinoms and cervicofacial actinomycosis.

- Over a period of months to years, lesions grow larger and heal to form raised wart-like scars.

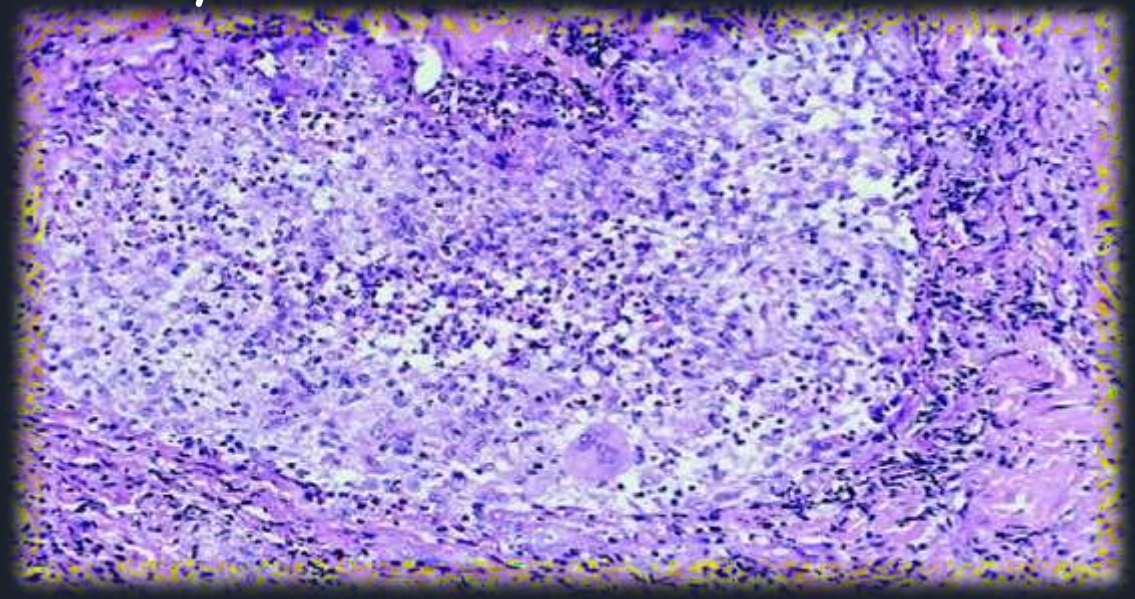
- Lesions may cover much of the face causing severe disfigurement.

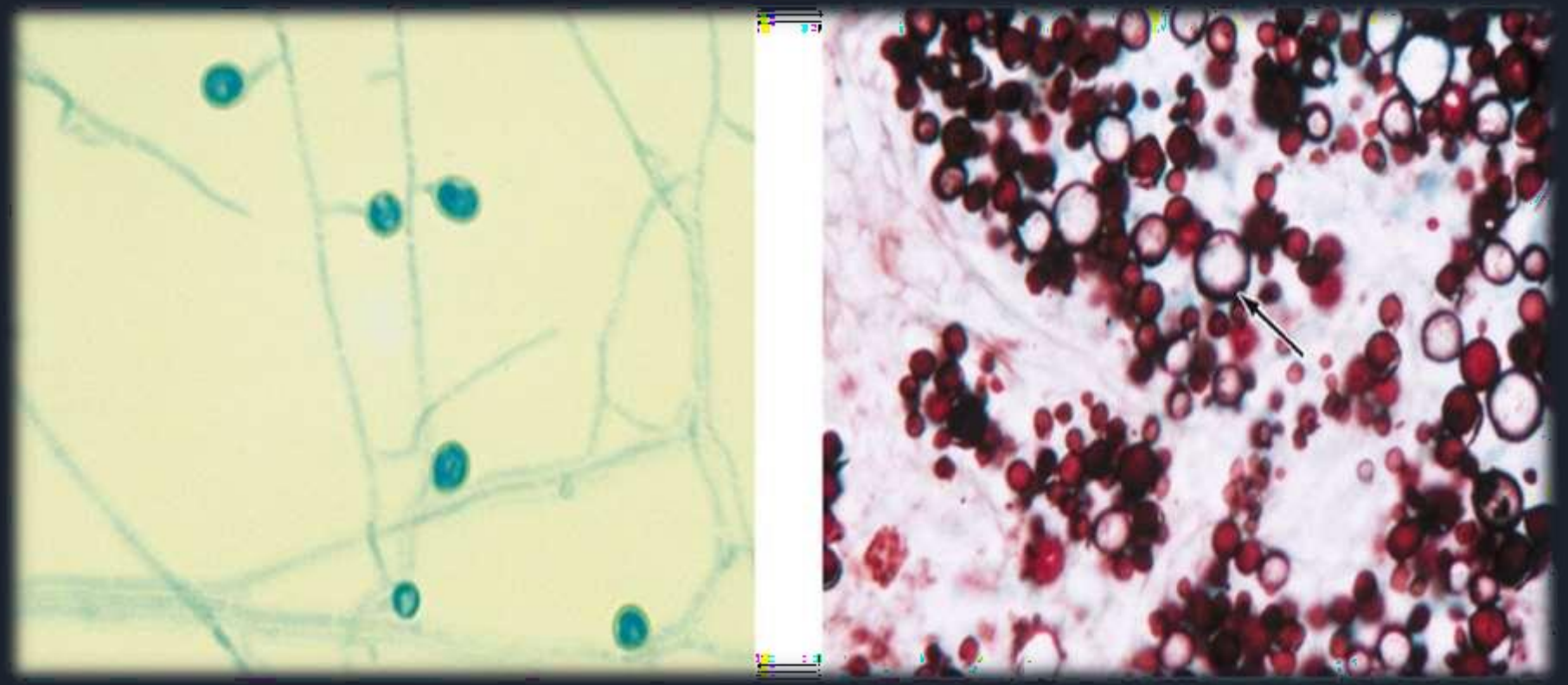


The basic inflammatory response in a deep fungal infection is granulomatous.

In the presence of these microorganisms, macrophages and multinucleated giant cells dominate the histologic picture .

Peculiar to blastomycosis is pseudoepitheliomatous hyperplasia, associated with superficial infections in which ulceration has not yet occurred.





Histologic freatures:-

Inflammed connective tissue shows giant cells and macrophages and typical round budding organisms with doubly refractile capsule measuring between 5 to 15 microns in diameter.

TREATMENT

- Those suffering from mild symptoms require no treatment as symptoms are usually self-limiting and the infection clears spontaneously
- When other organs or skin are involved, sponteneous resolution does not occur
- Itraconazole – oral
- Amphotericin B – intravenous

South American Blastomycosis
(Paracoccidioidomycosis)

- *Paracoccidioides brasiliensis*
- Distributed in Central and South America
- Lung infection occurs through inhalation or inoculation of spores.
- Systemic lesions are similar to those of North American Blastomycosis

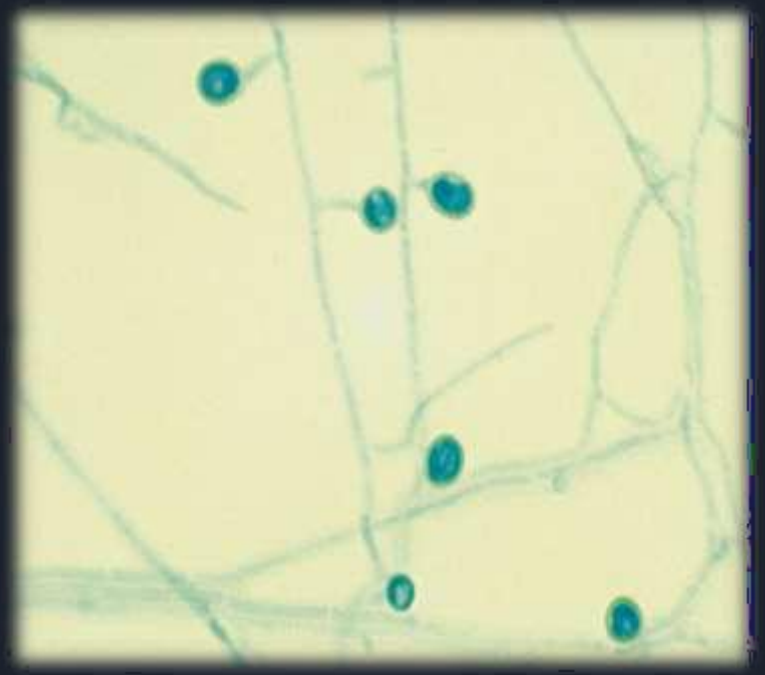
- The organisms enter the body through periodontal tissues and subsequently reach the regional lymph nodes, producing lymphadenopathy,

- Papillary lesions & Widespread ulcerations of the oral cavity

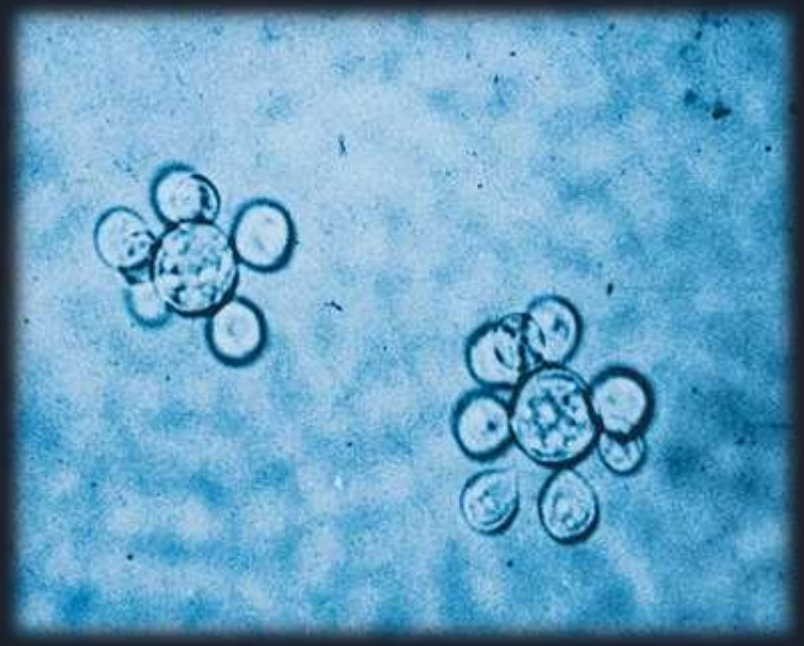
❖ The difference between north and South American Blastomycosis is in size of micro organisms.

❖South American Blastomycosis 10 to 60 microns in diameter

❖North American Blastomycosis 5 to 15 microns in diameter.



South American Blastomycosis



North American Blastomycosis

Diagnosis and Treatment

- Presumptive diagnosis made if budding yeast cells and pseudohyphae are found.
- Growth on selective, differential media differentiates *Candida* species
- Topical antifungals for superficial infections, amphotericin B and fluconazole for systemics

Coccidioidomycosis:
San Joaquin Valley Fever

- *Coccidioides immitis* - causes coccidioidomycosis
- Distinctive morphology – blocklike arthroconidia in the free-living stage and spherules containing endospores in the lungs.
- Lives in alkaline soils in semiarid, hot climates and is endemic to southwestern U.S.

- Arthrospores inhaled from dust, creates spherules and nodules in the lungs.
- A skin eruption resembling erythema multiforme occasionally appears concomitantly with coccidioidomycosis infection
- Amphotericin B treatment

CRYPTOCOCCOSIS

- *Cryptococcus neoformans* causes cryptococcosis.
- A widespread encapsulated yeast that inhabits soil around pigeon roosts
- Common infection of AIDS, cancer or diabetes patients.

- Infection of lungs leads to cough, fever, and lung nodules
- Dissemination to meninges and brain can cause severe neurological disturbance and death.

Diagnosis and Treatment

- Negative stain demonstrating encapsulated budding yeast
- Biochemical tests, serological testing
- Systemic infection requires amphotericin B and fluconazole.

Thank you

Interns batch(2019-2020)

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