

MICRO

Oral infections 2.

1. Fungal infections

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Significant yeasts from a medical point of view

Filamentous fungi

- Dermatophytons – obligate pathogens
- Moulds - opportunists

Yeasts - opportunists

Dimorf fungi – obligate pathogens

Candida infection

Stool transplantation!

Systemic candidiasis diagnosed by naturopath:
Does not exist in this form

Systemic candidiasis – mostly in immunocompromized
person – life-threatening disease

Local: stomatitis, fungal vulvovaginitis, etc.

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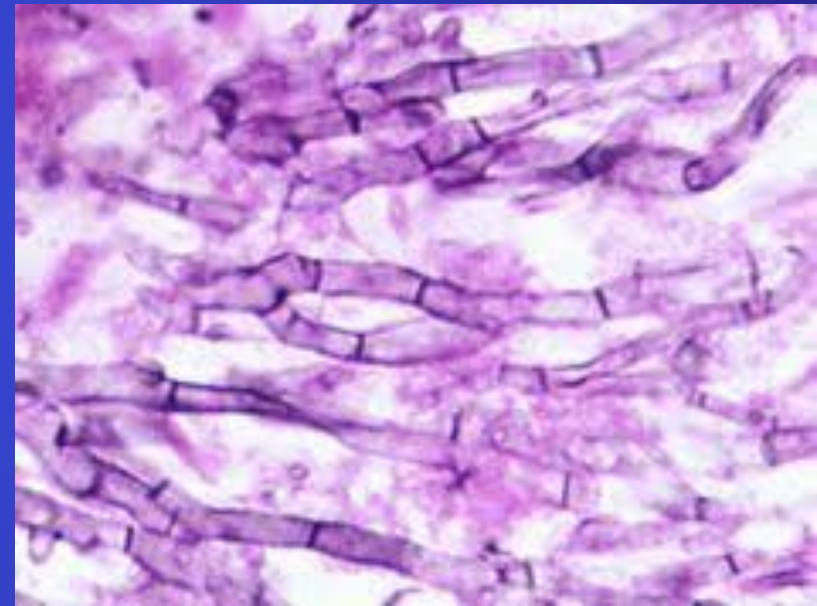
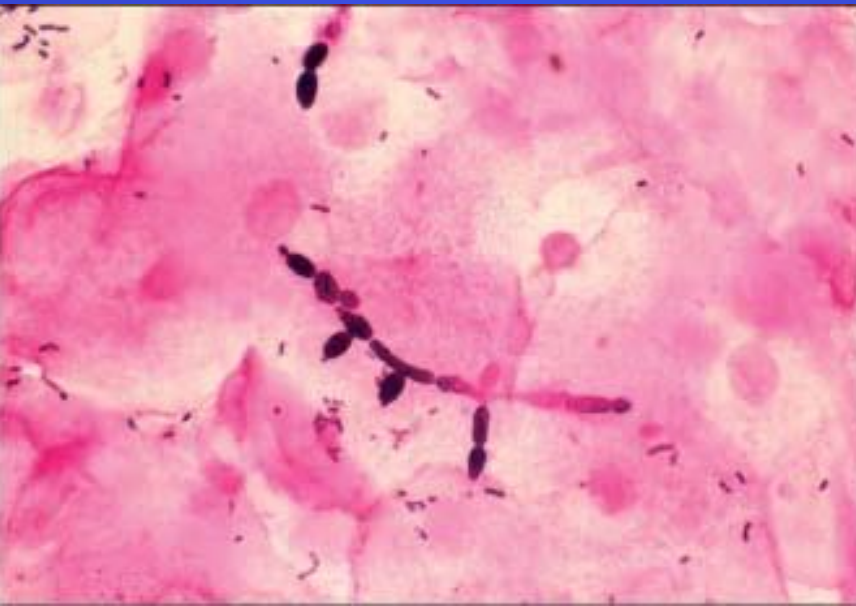
Candidiasis of the oral cavity

- Opportunist pathogens

 - Member of the normal microflora

 - Their colonisation in the oral cavity does not mean candidiasis

- The appearance of pseudohyphas implies candidiasis



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Fungal infections of the oral mucosa

- The prevalence of the fungal infection of the skin and mucosa is growing all over the world.
- It may significantly worsen the quality of the life and the survival of an additional disease - could be the source of a life-threatening infection
- The most common human fungal infection.
- It is an underdiagnosed disease – need improve the knowledge of the dentists

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Pathogen candida species

- Most wide-spread: **Candida albicans** (70-90%)
As an opportunist pathogen it may be detected in the mouth of many healthy individuals.
- Non-albicans strains are also common: **Candida glabrata, krusei, tropicalis, parapsilosis, guilliermondii**
- **Candida dubliniensis**: it belongs to the recently recognised species that was primarily isolated from HIV infected individuals' oral cavity. The number of cases when it's found in oral disorder, e.g. parodontitis is growing.

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Systematic predisposing factors

- Different immune deficiency conditions
(the pseudomembranous form develops in nearly 90% of HIV infected patients)
- Diabetes mellitus
- Smoking
- Sjögren syndrome
- Long term antibiotic treatment
- Childhood and infancy
- Hormonal changes
- Radiotherapy, chemotherapy, steroids

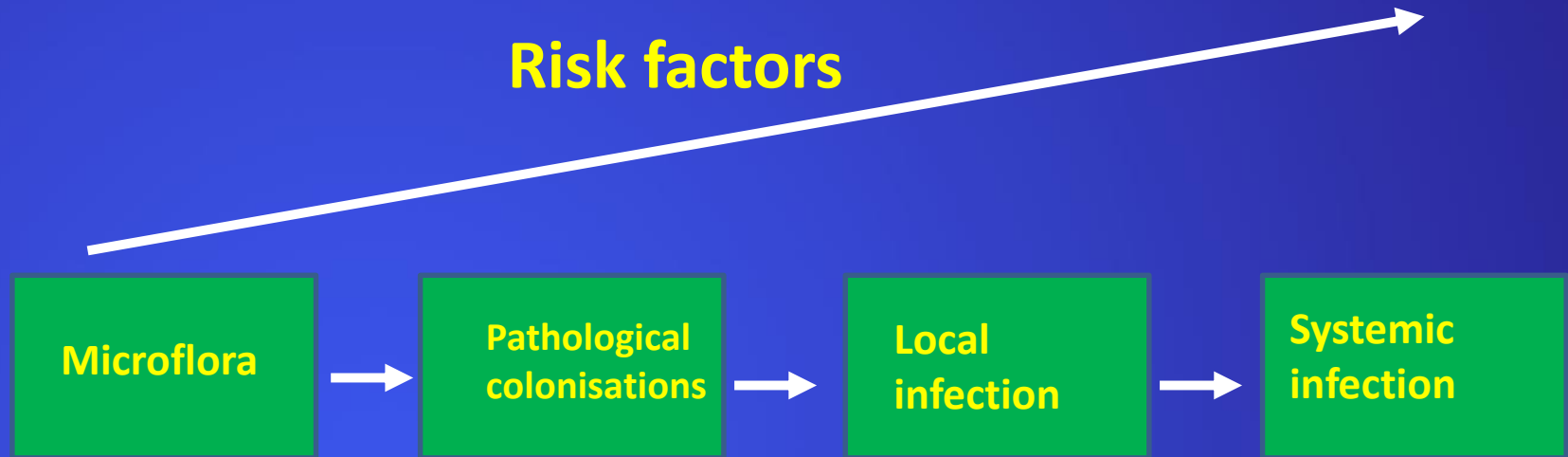
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Local predisposing factors

- Old and wrong dentures, K+B bridges, removable orthodontic appliances
- At night, during sleeping the number of yeasts increases in the mouth
- Altered microflora of the oral cavity
 - Chlorhexidine, contraceptives, oral sex, decrease of the Ph of the saliva
- Bad eating habits
- Smoking
- Bad oral hygiene

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Relationship between the Candida and the host body



Classification of the oral mucosal candida infections

- **There are countless different classification based on origin, clinical picture or localization**
- **Primary** oral candidiasis: affects the tissue of the mouth and the surrounding area
- **Secondary** oral candidiasis: oral manifestation of generalized candida infection

Primery forms

- **Acute forms:**

- pseudomembranosus
- erythematosus

- **Chronic forms**

- hyperplastic
 papillar
 plaqued (Candida leukoplakia)
- erythematosus
(- chronical multifocal candidiasis)

- **Lesions related to Candida (multifactorial diseases):**

- denture stomatitis
- angular cheilitis
- median rhomboid glossitis
- linear gingival erythema

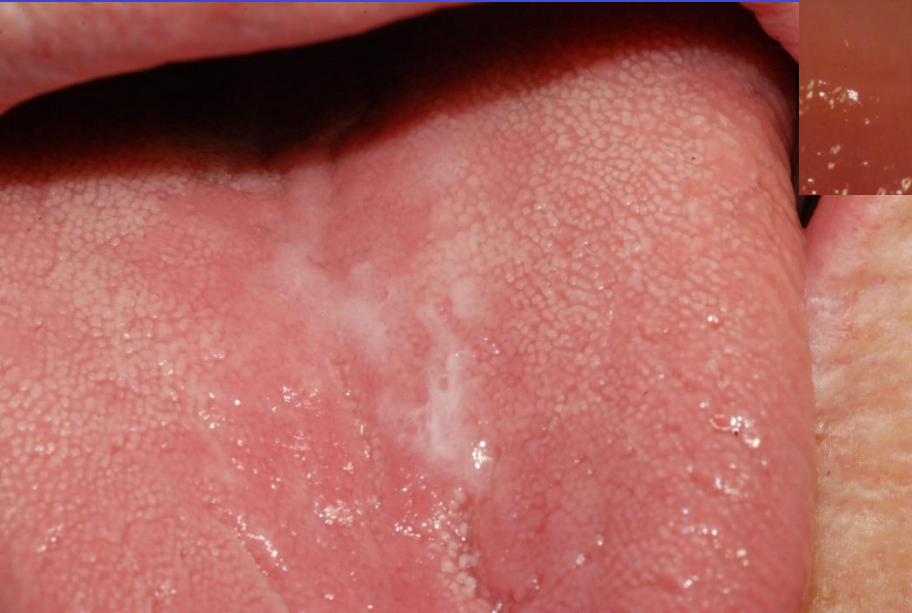
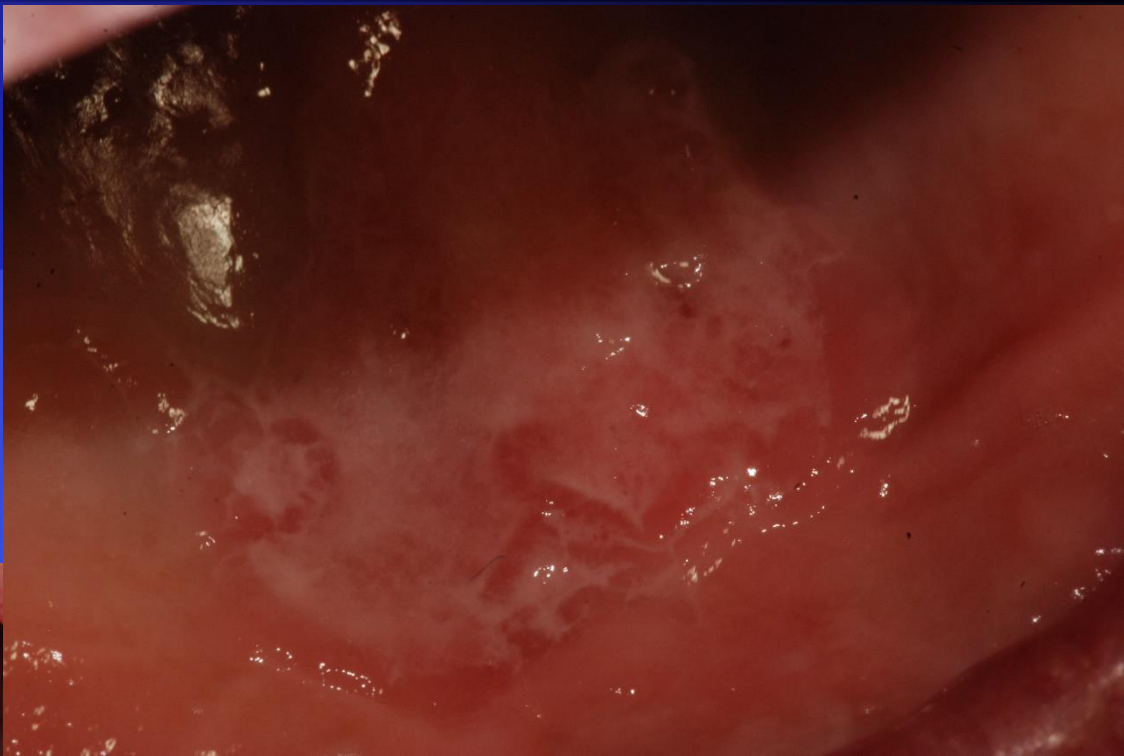
Secunder forms

- Oral manifestations of systemic mucocutan candidiasis

Acute pseudomembranous oral candidiasis

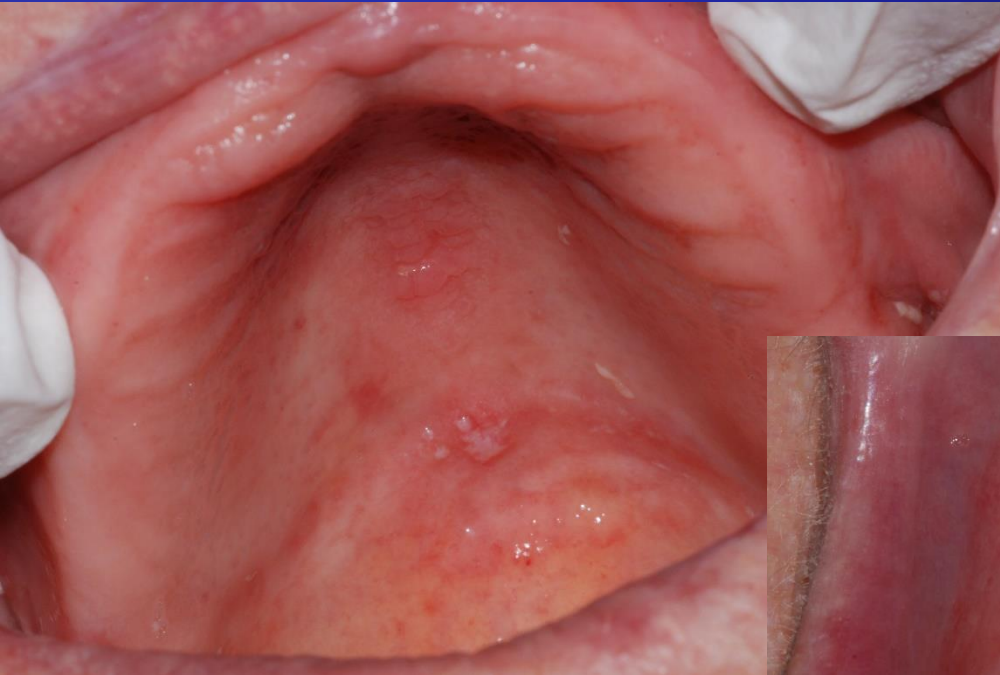
- Always indicates a severe background disease in „healthy” individuals (except babies)
- In AIDS patients its appearance precisely indicates the stage of the disease

Pseudomembranous candidiasis



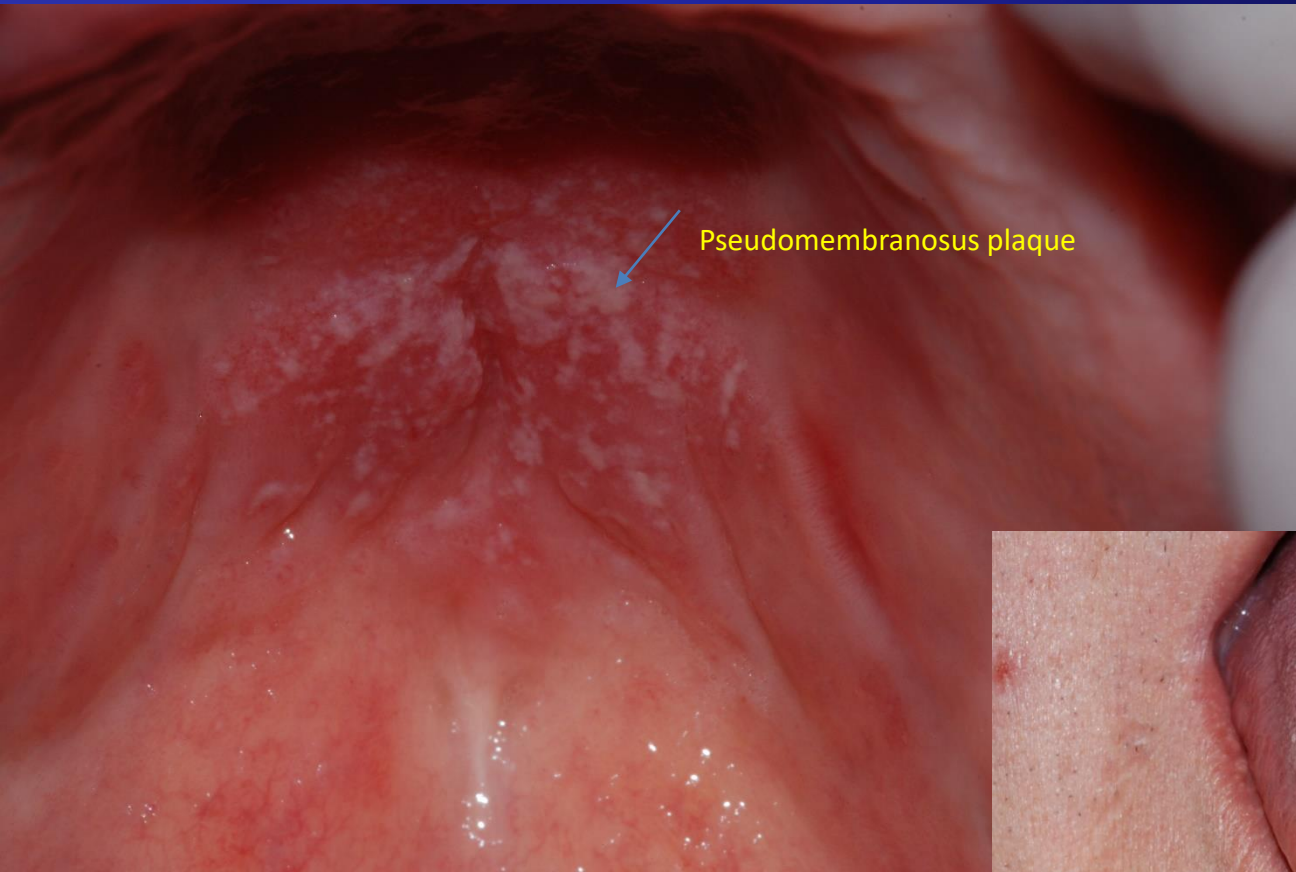
Unknown origin

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Patient with asthma

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Pseudomembranous plaque

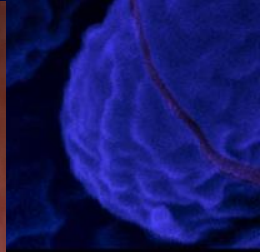
Diabetes



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Long continued flue, antibiotic therapy



Recurrent vaginal infections



Erythematous candidiasis

- Most common form
- Could exist as a secondary form from the pseudomembranous type or primarily
- Could be the first sign of HIV infection
- Most times the patient has removable denture – glossitis and/or angular cheilitis are often related to it

Acute erythematosis

- It is often found in HIV positive patients but also appears in immune deficiency conditions and as a consequence of sexual infections.
- Usually goes with symptoms, causes a burning, stinging sensation on the mucosa

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Acute erythematous form



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Chronic erythematous form

Asthma spray



Diabetes



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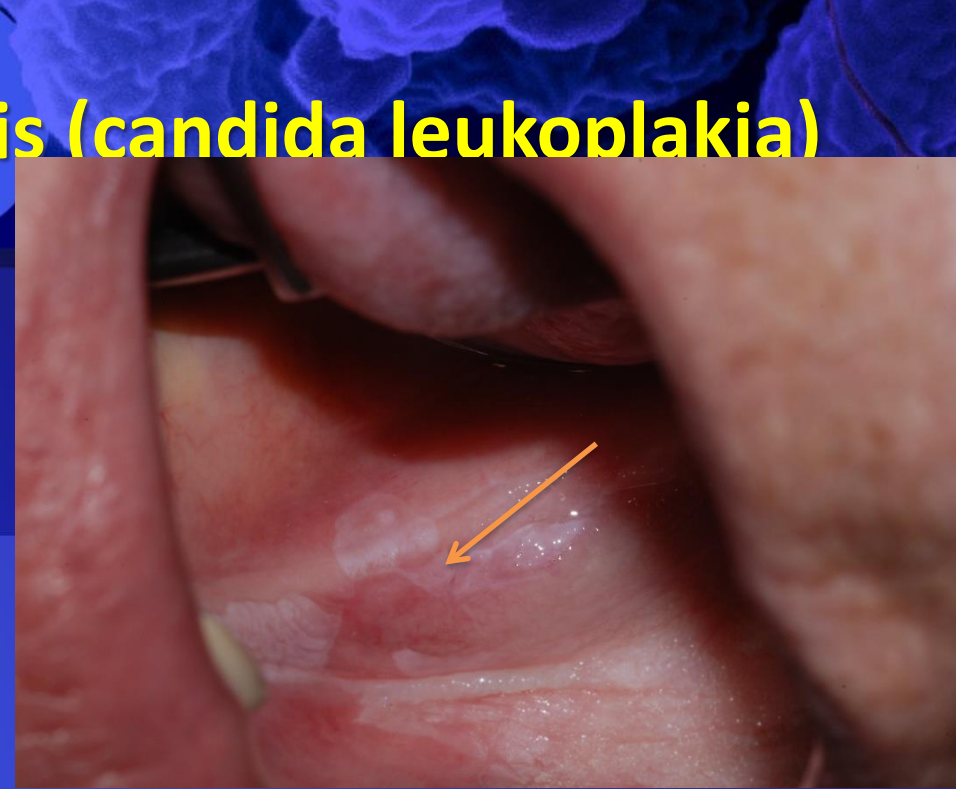
Hyperplastic candididasis - candida leukoplakia

- More common in smokers - may recover as a result of quitting
- Precancerosis – danger of malignization is high – around 15%
- If it does not react to antifungal therapy then biopsy is advised
- It is not clear whether in this form the yeast has a pathogenic role

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Hyperplastic candididasis (candida leukoplakia)

- Most times it is found on the mucosa of the bucca and less often on the edge of the tongue
- Its surface may be homogenic or papillomatosus
- Not possible to wipe off



Differential diagnosis:
pseudomembranosus form

Hyperplastic candididasis – papillary form



Lesions related to Candida

- Denture stomatitis
- Angular cheilitis
- Median rhomboid glossitis
- Linearis gingival erythema

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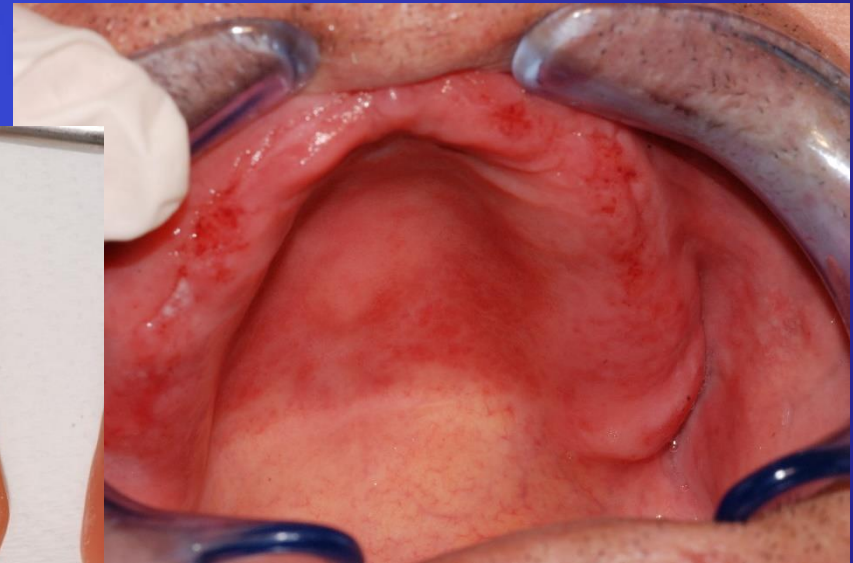
Denture stomatitis

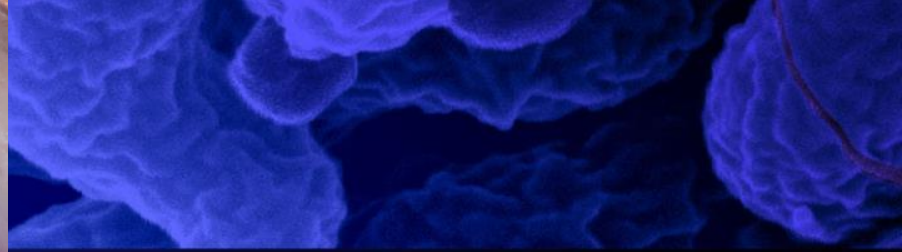
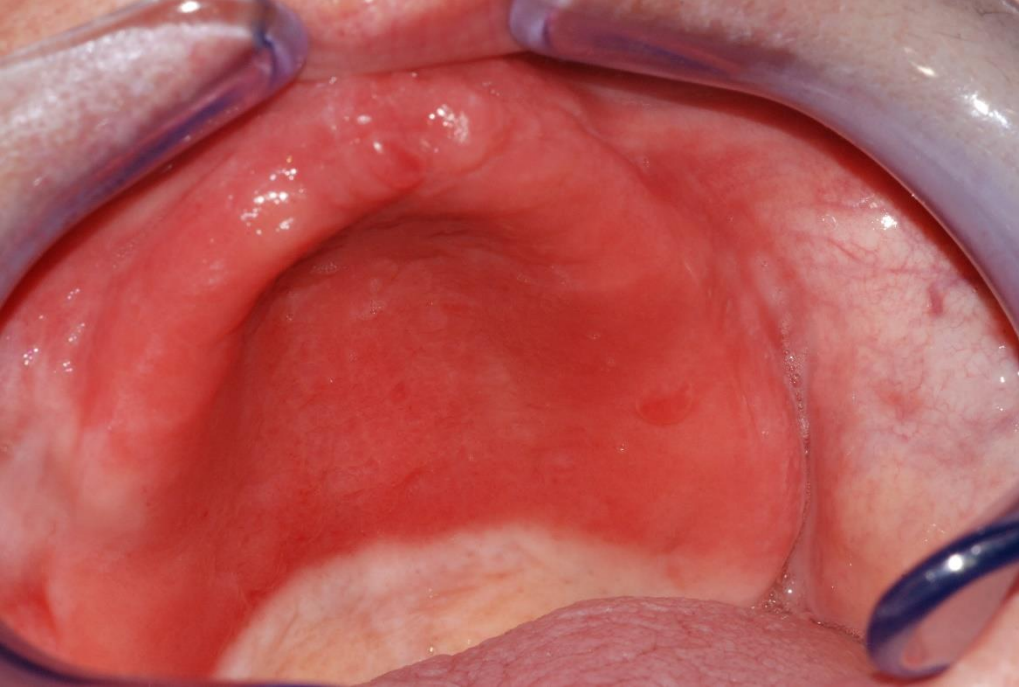
Could be experienced the chronic inflammation of the lip, mucosa and the angulus oris, possibly the patient complains about chronic mouth burn

Inflammations appear in 50-70% of patients with removable denture, but often do not cause complaints



- The erythema follows the outline of the denture
- Appears in women more often
- Often the papillomatosus form may be detected on the palatum
- It is rarely treated properly





Lingua fissurata



Candidiasis developed by a K+B bridge



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Newton classification of oral stomatitis

- Newton I: local erythematosis – red spots on the mucosa
- Newton II: diffuse erythematosis - on denture covered mucosa
- Newton III: hyperplastic granulomatosis

Cheilitis angularis

- The erythematous inflammation of the angulus, with ruptures around the contacting areas
- Often overinfected with *Staphylococcus aureus* or other bacteria
- Bad denture – low bite height
- Maceration by infected saliva



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Median rhomboid glossitis

- Chronic inflammation that goes with papilla atrophy or lobular changes of the tongue
- Not always clarified origin but often recovers as a result of anti-fungal therapy



Differential diagnosis - denture stomatitis

- Glossitis: smoothy and shiney surface also in lack of B12 vitamins, follic acid and iron
- Allergy – acrylic or other
- Hyperplastic form: leukoplakia, lichen and lichenoid reactions, pemhigus, carcinoma



Linear gingival erythema

- It was first found in HIV infected patients
- Not caused by plaque, does not imply pockets development
- 2mm-s line around the marginal gingiva
- Mixed infection –bacteria and fungals
- Could developing in cases with good oral hygiene too
- In a number of cases *Candida dubliniensis* was isolated from the deformation



Chronic mucocutaneous candida infection

- Develops in immune deficient patients
- Persisting mucocutaneous infection, that does not react to locally applied drugs
- Systematic azol treatment is necessary



Treatment of denture stomatitis

- Antifungal therapy + replacement or professional cleaning of the denture
- Regular disinfection of the denture is necessary afterwards – e.g. with chlorhexidine (must be fully removed otherwise it may discolour the denture)
- Nystatin and chlorhexidine neutralize each other therefore the denture must be washed off and air dried

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Polyenes – non toxic used per os

- **Nystatin**

The most commonly used local drug

Should be a first choice medicine generally when the infection is not too serious or old or the patient hasn't immunodeficiency

- **Amphotericin B cream, suspension**

Also effective with the non-albicans species

Not absorbed from the digestive tracts

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Azoles

Imidazoles: clotrimazole, etoconazole, miconazole, isoconazole
only dermatological and gynecological packings are available in Hungary

Ketoconazole: Also has wide spectrum but is very hepatotoxic – could be fatal

Formulation for local use: cream, tablet, shampoo

Flukonazol

- The British National Formulary has listed it as suitable for dental use
- Non-albicans types are less sensitive or resistant to it
- A first choice systemic drug if there is no suspicion of a non-albicans type causing the infection
- Suspension is available
- Few significant drug interaction



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Triazoles

Itrakonazol

- Has a wider spectrum than fluconazol, therefore is well suitable for fluconazol resistant infections of immune deficient patients
- Absorption is not reliable, therefore cannot be applied in systemic infections
- May be hepatotoxic so liver functions must be monitored throughout the treatment
- Must be paid attention to drug interactions: cyclosporin, terfenadin, astemizol, digoxin. The level of cyclosporin and digoxin must be monitored.

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Other antifungal compounds

- terbinafin
- voriconazol
- echinocandins
- posaconazol
- 5-fluorocitozin

Not used in oral Candida infections

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Certification of fungal infection

- Cultured of a fungus doesn't mean infection
- Microscopic investigation is useful - pseudohyphae
- Quick tests
- Cultures

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A microscopic view of various bacteria, including rod-shaped and spherical forms, some with flagella, set against a dark blue background.

Oral diseases caused by bacteria

Gingivostomatitis ulcerosa

- Ulcerous, painful, acute inflammation of the gingiva
- Its symptoms are bad breath and a yellowish coloured ulcer ring around the edge of the gingiva
- In severe cases systematic antibiotic treatment may be necessary (metronidazol, amoxicillin)
- If untreated, it may leave an irreversible parodontal and bone damage behind
- Mixed infection

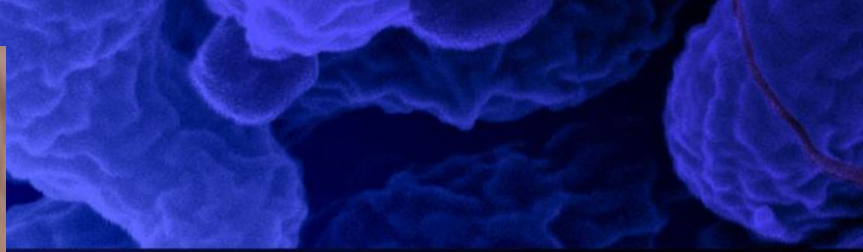


Impetigo contagiosa

Streptococcus,
Staphylococcus aureus

- Causes superficial pyoderma
- It appears most often on the face, around the mouth
- Spreading yellowish scab developed from the small pustulas
- It may appear in the oral cavity in the form of painful and deep ulcers







Plaut-Vincent angina

Fusobacterium Plauti-Vincenti and Borrelia Vincenti

- **Affects the oral cavity only**
- **Caused by spirochetes and fusobacteria**
- **May also develop from gingivostomatitis ulcerosa**
- **Necrotic ulcers, bad breath, enlarged lymph nodes, pain**
- **Good outcome**

Actinomycosis

- Actinomyces israelii – bacteria, not a fungus
- Most commonly appears in the angulus of the mandibula
- The pathogen gets in through lesions



Diphtheria

- **Rare in Europe due to vaccination**
- **Regional lymph nodes swelling**
- **Ulcers covered with membranes on the palatum, pharynx, larynx, tongue, bucca, in the nose – danger of suffocation**
- **Differential diagnosis: Plaut-Vincent angina, herpangina, mononucleosis, leukaemia**

Scarlatina

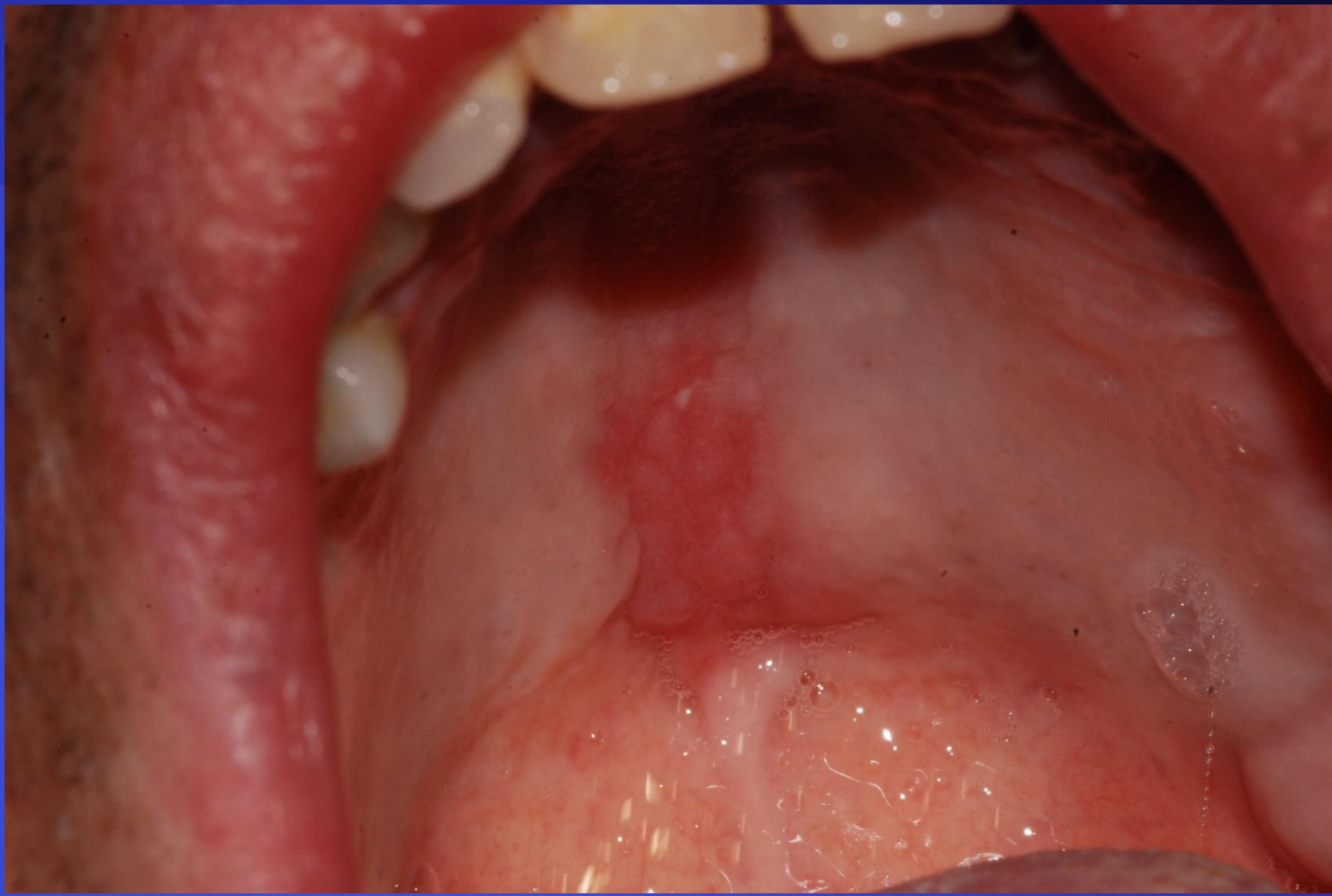
Streptococcus pyogenes (beta haemolytikus)

- Acute disease spread by droplet infection
- General symptoms, sore throat
- The oral mucosa is inflammed, swollen, red (stomatitis scarlatina)
- Papillas red and swelled - strawberry tongue
- Differential diagnosis: diphtheria, mononucleosis infectiosa, candidiasis



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Syphilis – STD



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A microscopic image showing various biological cells and structures, rendered in a blue color scheme. The image is partially obscured by the large text 'MICRO' on the left.

Thank you for your attention