Lecture #:
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Doctor:
Faleh sweer
Done by:
Elaf alasfar
Corrected by:
Name
Day & Date:
sun, 18th, sep, 2016
Price:
Website:
http://dentistry2018.weebly.com/
Contact Us:
Ljneh Asnan
Dentalc2013@gmail.com
Dental Correctionn
D.correction2013@gmail.com
White lesions

The normal color of the mucosa is pink, and as we know the epithelium is avascular; not pink in color; so the pinkish color comes from the red color of oxygenated blood present in the underlying connective tissue modified by the overlying thickness of epithelium, by presence or absence of keratin, and by the activity of the melanocytes in the basal layer.

so we expect that if there is an increase in the keratin layer at the surface; either orthokeratosis or parakeratosis, or increase in the thickness of epithelium; acanthosis or hyperplasia, or edema within the epithelium or if there is a dense inflammatory cell infiltrate, these will prevent us from seeing the color of oxygenated blood and will give the lesions the whitish appearance, so when you see a white lesion you expect one of these structural changes.

But be sure first that this color is not a deposit on the surface, because sometimes deposit of something gives whitish color. You check it by gauze; you scrape the lesion, if it is external deposit like material Alba(accumulation dead cells,debris,food..) or plaque on the gingival (in patient with very poor oral hygiene) which gives the color of a whitish lesion when you scrape it with gauze the whitish color will disappear. The same applies to coated tongue; which is whitish dorsum of the tongue due to accumulation of desquamated cells and debris in patients with febrile illness or due to fasting.

Be careful when you see whitish/yellowish lesions that it can be caused by loss of these layers (ulcer), acute ulcers(pic. In slide 7): bleeding with time we’ll have granulation tissue and Fibrinous exudates and bacteria and debris which give the yellowish color. So erosion or ulceration in the oral cavity will appear whitish or yellowish.

*The dr show a pic.(slide 8) And said: loss of vascularity in lamina propria; sub mucus fibrosis

- You have to differentiate between coated and hairy tongue, both look white layer on the dorsum of the tongue. if this layer is constant this is called hairy tongue that happens due to elongation in the filiform papillae (increase in the keratin). but if it’s a deposit of desquamated cells, food debris, bacteria,or others on the surface, in temporary conditions, like febrile illness, fasting, or respiratory tract infection or other illness, this is called coated tongue, it’s temporary; related to the illness, where there is no(difficulty) mastication or swallowing, etc, so we have deposit of things over dorsum of the tongue which give the dorsum whitish color that disappears when tongue function retains.

- classification of white lesions is according to the etiology of the white lesion:

1. Hereditary causes, oral epithelial naevus or white sponge naevus, leukoedema and other rare lesions.
2. **Traumatic** due to *chronic mild irritation*, mechanical (frictional keratosis) or chemicals that cause irritation of the oral cavity, or thermal.

3. **Infection**: fungal, candidal. We have three types of candidal infection (Pseudomembranous [Chronic Hyperplastic Chronic Mucocutaneous]) that give a white lesion in the oral cavity; other candidal infections appear red lesions. Syphilitic leukoplakia although it's rare now, it gives a white lesion in the oral cavity. Viral infection like hairy leukoplakia in immunocompromised patients also appear as a white lesion.

4. **Dermatological**: skin and oral lesion that appear as white like lichen planus, and lupus erythematosus.

5. Sometimes you see white lesion that can be a sign or manifestations for oral cancer or potentially malignant lesion.

6. **Idiopathic**: without any one from the causes above, called idiopathic white lesion or leukoplakia.

**Hereditary:**

*White sponge naevus* (WSN):

from the name it’s white, sponge like, autosomal dominant; there is a family history; so there is early presentation of this white lesion, (usually other types of white lesions appear in adult, so when you have a patient with **chronic white lesion** in the oral cavity, you have to think about hereditary cause and one of them white sponge naevus) - **Genetic cause**: mutation of genes coding for keratin 4 or 13, which make a disturbance in the epithelium, that gives the whitis appearance.

- In case slide 15: White lesion on right buccal mucosa extend post. To 3th molar and to palate and dorsum of tongue (WSN).

  clinically: asymptomatic, painless whitish lesion, soft like a sponge, irregular with no defined border; it’s a gradual transition to the normal mucosa, most commonly it’s **bilateral** at the buccal mucosa, and as we said the patient is a child with family history.

  Can affect also soft palate and the tongue, and it’s rare to be seen at the gingival margin. the lesion surface is usually shaggy (not uniformed), Transmitted to other sites and thick.

- one of its specific features is that it can affect other sites other than the oral cavity, other mucus membranes like nose, esophagus, genital regions, so this can help you in the diagnosis.

- **Histologically** : ( the structural changes ) acanthosis (hyperplasia), moderate marked hyperparakeratosis, and marked intracellular edema which is called basket-weave appearance, this edema happen mainly in prickle cell layer. also you can see condensation of keratin around nucleus, and this we can see it in smear, under the microscope we see **condensation of eosinophilic material** around the nucleus, which is the keratin, this is a cellular change in white sponge naevus. **No dysplasia** in the epithelium so it’s **not potentially malignant** (but leukoplakia it is). No inflammation in the lamina propria so
the problem was not initiated in the connective tissue, white sponge naevus started in the epithelium and as we said it’s a genetic mutation in the keratin. When scratch, it isn’t disappear.

- lamina propria: connective tissue under the epithelium. lamina propria with the epithelium is called oral mucosa.

**Leukoedema:**

Slide 17: White lesions at the buccal mucosa, usually bilateral, translucent, look like lichen planus. present in high percentage of people mainly people with dark skin, the darker the skin the higher the percentage of leukoedema. as we said most commonly at buccal mucosa, but we can see them at the lateral border of the tongue. asymptomatic, diffuse translucent, grayish white folded lesions.

stretch test: when you stretch the mucosa the lesions disappear. this confirm the diagnosis so no need for biopsy or other tests, it’s very easy to diagnose. the lesions disappear because they mainly made of edema in the epithelium so when you stretch the mucosa the thickness of epithelium become normal again so the lesions disappear. if the lesion is made of keratin, stretching won’t change any thing in it. histologically you can see mild parakeratosis and intracellular edema like white sponge naevus with normal lamina propria, no thick layer.

- the coming lesions we are not going to talk about them in details, but you have to read about them from the reference, they are rare but in all of them, we see a lesions that look like white sponge naevus, hereditary (in young patients) and have other manifestations:

1. pachyonychia congenita: characterized by thick nails and whitish patches in the oral cavity that histologically looks like white sponge naevus.

2. dyskeratosis congenita: you have to remember that this is whitish lesion in the oral cavity, which is potentially malignant (SCC), and the patients have destructive perodontitis.

3. tylosis: AD, leads to esophageal cancer in the patient. thick keratin at the soles and in palms.

4. hereditary benign intraepithelial dyskeratosis: in the eye presented by dense conjunctiva that can lead to blindness, whitish lesions in the oral cavity.

5. follicular keratosis: there is a suprabasal cleft in the epithelium like pemphigus it makes intraepithelial clefting, and like vesiculobolus disorders (lesions that make bolus or vesicles as a result from the separation) that we will talk about it later on.
traumatic keratosis:

mechanical is the most common cause of white lesions. trauma by mild chronic irritation or friction, not acute trauma. acute trauma lead to ulcers and hematoma. as a result from the chronic trauma there will be hyperplasia and hyperkeratosis, and these two give the whitish lesion. hyperplasia and hyperkeratosis are made to protect the mucosa.

- slide 30; this is called frictional keratosis, it’s mechanical, prolonged (chronic) mild abrasion or irritation; can be from: a) the teeth, b) habits like lip or cheek biting or friction between lip and teeth to relieve stresses, c) rough tooth surface, d) rough lingual restoration that can irritate the lateral border of the tongue, e) dentures make white lesions in the vestibule, f) tooth brushing (some patient brush the gingival) this type is associated with recession with whitish membrane on the gingival, and usually these patients show good oral hygiene and they are usually educated g) alveolar ridge in edentulous spaces with mastication, they become traumatized and whitish, labial more common than buccal in our area.

- clinically: dense whitish patches, with rough surface, usually lesion from the trauma have rough surfaces because when the patient bites, he removes some parts from the epithelium, so some regions become keratotic and thick and others become thin due to erosion and removal of epithelium, border is clear.

- How to differentiate cheek biting from white sponge naevus?
  from the clinical image both are seen most bilaterally on buccal mucosa. traumatic keratosis has definite boder not gradual like white sponge naevus, distribution less, but more important you have to pay attention to the extension of the lesions, in traumatic keratosis the lesion is only parallel to the occlusal line in the area that the patient can reach in cheek biting, it can never reach the vestibule. plus the presence of family history in white spongy naevus. in white spongy naevus there are other sites affected while in the traumatic keratosis the mouth is only affected, more severe anteriorly.

- Linea alba: sometimes the patients have a white line parallel to the occlusal line, and they don’t have cheek biting habit, this happen due to spontaneous irritation to buccal mucosa during occlusion, other patients suck their buccal mucosa, which lead to elevation in the buccal mucosa parallel to the occlusal line.
  Slide #34: pic. From left upper; traumatic keratosis from denture wearing, right upper traumatic keratosis caused by recession from tooth brushing horizontally, lower left caused by mastication, the last one from lip biting.

- diagnosis of traumatic keratosis: first you have to find the cause, that fits the shape and the size of the lesion, if there is no cause there is no diagnosis, then when you find the cause, you have to remove the cause, and expect that the lesion will heal with time, it takes more time than ulcers, but within three to four weeks the whitish color should be less clear.

- Histologically: hyperplasia and hyperkeratosis, No dysplasia. the irritation reaches the lamina propria so we will find in it scattered chronic inflammatory cell infiltrate.