***Sheet #20***

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***Gingival Enlargement***

What causes “Gingival Enlargement"?

Gingivitis , abcess , Drugs (that cause enlargement), tumors (fibroma, papilloma, pyogenic granuloma, …. Localized enlargement) or false enlargement

***Definition***: increase in the size of the gingiva. – another name **Gingival over growth**, and in the past it called **generalized hyperplasia** -

It's either generalized or localized.

hyperplastic gingivitis or gingival hyperplasia, it’s not accurate because sometimes you might have hypertrophy, so we got to stick with the general clinical term because you wouldn’t know if there was hyperplasia unless you had a histological section. (hyperplasia or hyper trophy, are histological terms) we don’t use them. It is better to stick to the clinical feature

It can be localized or generalized, usually it can be marginal, papillary, diffused, or it can be discrete (an isolated lesion) like tumors.

Normally the gingival is pink, firm, the size is within normal limits, scalloped contour, feathere-dged. While in inflamed gingiva you can see edema, the contour is obscured, no featheredge anymore.

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| *T types of Gingival Overgrowth based on*  *aetiology:* |  |
| *I- Inflammatory enlargement:*  A .Chronic  B. Acute  *II. Drug-induced enlargement*  *III. Idiopathic/Hereditary enlargement*  *IV. Enlargements associated*with systemic  diseases orconditions:  *A. Conditioned enlargement*  1. Pregnancy  2. Puberty  3. Vitamin C deficiency  4. Plasma cell gingivitis  5. Nonspecific conditioned  enlargement (pyogenic granuloma) | **B.***Systemic diseases causing gingival*  *enlargement*  1.Leukemia  2.Granulomatous diseases  (Wegener's granulomatosis,  S sarcoidosis)  ***V. Neoplastic enlargement***  (gingival tumours)  A , Benign tumours  B, Malignant tumours  ***VI. False enlargement*** |

1. ***Inflammatory enlargement:***

the most common cause of enlargement is inflammation not drugs , (basically the chronic one), it can be acute or chronic.

1. ***acute inflammation*** can cause enlargement , like an abscess (gingival swelling and might be periodontal or gingival): small swelling next to a tooth that happened within short period
2. ***chronic inflammation*** –the most common-

🡪due to constant irritation, like prolonged expose to dental plaque, or Local factors like: irritation by anatomical abnormalities, improper restorative work, orthodontic appliances and mouth-breathing.

***Clinical features***

* it starts with mild swelling involving the marginal and papillary gingiva then it progresses.
* Soft, friable, red, shiny surface or pink, firm, resiliant.
* It can be generalized or localised, depending on the location of plaque
* Slowly growing, Painless.
* Usually fibrotic but if it was inflamed it would be more edematous.

Secondary complication to other types of enlargement 🡪 combined enlargement

sometimes other types of enlargement can be combined with inflammatory, especially if there was swelling and plaque control was difficult so eventually we’ll get inflammation so the enlargement get even worse and even larger and this is called combined enlargement.

**Histological section:**

It’s an inflammatory lesion so you expect to see many chronic inflammatory cells infiltrate, (occupying most of the connective tissue), 2) the connective tissues is quite thickened, 3) the entire epithelium is quite thick.

***Mouth Breathing***

is unique feature for special kinds of chronic inflammation that causes enlargement,

* Usually it is red, erythematous with shiny surface, and limited (localized) to the area that is exposed to air (Maxillary anterior area) ,, especially in patients with incompetent lips.
* There is a mouth breathing line that separates the inflamed from the non inflamed area (exposed from non exposed).
* Aetiology:

It’s cause is not known but most say it’s because of the surface dryness (dry plaque) that might change the type of bacteria that is present since there is less salivary flow so you might have this kind of enlargement.

1. ***Drug Induced gingival enlargement***

* Associated with some anticonvulsants; *phenytoin* (epilepsy patients), immunosuppressive agents; *cyclosporine*, calcium-channel blockers (for hypertensive patients).

Usually ***Clinical features*** are similar in all drugs, with slight differences, so you can’t really tell which one is which according to just clinical presentation and histology so history is needed in such cases.

* Usually they all start from interdental papilla and gingival margin, and start growing on the buccal surfaces of anterior teeth, it gets larger and larger until it merges with lingual gingiva.
* It is usually pink, firm and resilient unless if it was inflamed it becomes edematous and bleeds easily.
* The enlargement appears as if it is coming from underneath the gingival margin, sometimes you can see a line separating the gingival margin from this lesion (linear groove). the problem with it is that it retains plaque which causes infection and further swelling and enlargement.
* it can be localized, but Generalised usually, More severe in anterior areas
* and usually in dentate patients, it can happen in edentulous areas but notice when you extract the teeth it goes away (disappears)! So even though it’s drug induced it is probably related to the presence of plaque.

Few facts that you need to know:

1. It can happen in mouths with little or no plaque, and may be absent in mouths with heavy plaque so there are no ground rules here.
2. Inflammation is it a prerequisite of enlargement? Maybe, some say that there are some fibroblasts that are sensitive to phenytoin if there is inflammation, if there is no inflammation we won’t get this kind of response (Fibroblasts are less active). and this is maybe because of genetic predisposition and usually when it is surgically removed, it recurs. So the best solution is to substitute the drug with another, and see the outcome after 6 months.

***Histologically*** -and this is applied on most of the enlargements, not

Just the drug inuced-

Hyperplasia of epithelium and connective tissue (fibroblasts, blood vessels, ground substance), there will be inflammatory cells infiltrate in the middle of the area.

The cause is not known exactly; the presence of inflammation with the drugs increases the enlargement more and more, it increases the production of collagen by the fibroblast, -evidence links it to a direct effect on specific, genetically predetermined population of fibroblasts-, some people say that it’s the breakdown of collagen not the production that causes this enlargement; Everything in the body work in cycles, there is collagen production and degradation ,, the drug affects the destruction mechanism –inactivation of collagenase enzyme- ,, and some people say that it’s plaque induced problem.

So 3 different causes, it might be one of them, it might be all of them together.

***Clinically*** they don’t differ that much, but the growth that is induced by ***cyclosporine*** is more vascular, more red, and more blood vessels in histological sections.

Gingival enlargement occurs in about 50% of patients receiving the drug **Phenytoin**, so it’s the most common drug that causes overgrowth, **Cyclosporin** is the 2nd most common (25%-40%) , then **Calcium Channel blockers** like **Nifedipine**, **amlodipine** (20%).

**Anticonvulsants**, most important drug is phenytoin (dilantin) used for epilepsy, most types of epilepsy except Petite mal

it’s the most common type of drug induced gingival enlargement, it happens in 50% of the patients, usually in young patients because fibroblasts response is more active, it not necessarily related to the dose, once you cross a certain threshold you will have this enlargement.

*Clinical features:*it’s a bead like enlargement, it started in the papillas and if too severe the 2 papillas might fuse in the middle, and plaque removal becomes difficult.

There is a picture of a very severe case in a 5 years old child (as you can notice the younger the patient the more severe the case is) and just parts of the teeth are showing because of the very sever gingival enlargement.

Histologically, we can see *acanthosis*, rete pegs of the epithelium, very thick connective tissue with barely any vascular tissue within.

There is a Picture of a combined case of gingival enlargement caused by phenytoin and complicated by inflammation

**Immunosupressants “Cyclosporins” ,** Used for autoimmune diseases or organ transplant rejection.

the enlargement is similar to that of phenytoin’s but might be more vascular, it’s prevalence is a bit less than that of phenytoin, might be up (might be up to 50%, 35% is the average), it happens in children (young age) as well, some patients have hypertension at the same time and if you give them calcium channel blockers with cyclosporins they tend to have synergistic effect and you’ll get even more enlargement.

Famous substitute for cyclosporin that’s becoming more popular recently is ***tacrolimus***, it has less side effects, less nephrotoxicity and less gingival enlargement.

Clinically, you can’t tell which drug of the 3 induced the gingival enlargement.

Histologically the only difference that you see is the presence of more blood vessels than in the case of phenytoin but again it’s not specific.

**Calcium Channel Blockers,** Used for many cardiovascular diseases, especially *nifedipine* (Adalat), it occurs in 20% of the patients, so this is the least common, again larger enlargement when combined with cyclosporine, substitutes can be used to solve this problem.

A picture showing amlodipine induced gingival enlargement, quite sever and secondarily inflamed in some of the sites.

***Treatment?!***

Maintenance of Oral hygiene , it well reduce the inflammation, then try to change the drug, it will go back to normal within few months, if the physician didn’t accept to change it , we do surgery – gingivectomy procedure- we cut the tissue away, and establish healthy normal contour, but the problem is the high risk of recurrence.

We do the surgery; For esthetic reason, if affecting the function –mastication- sometimes it tends to cover the occlusion ,that will lead to continuous bleeding and trauma. If affecting the speech, or tooth eruption. Another reason is to make it cleansable , otherwise you’ll end up with periodontal disease.

It’s important always to reevaluate the trt and maintain it.

1. ***Genetic (HEREDITARY) or idiopathic gingival overgrowth***

* Mostly in young age, teensgers. (Between 10 and 20 years old).
* gingival is very tick all around, buccally and lingually, very bulky, covering most of the occlosal surfaces, , it involves attached, marginal and papillary gingiva. Labial and lingual surfaces, & highly susceptible to secondary infections.
* Pink, firm, leathery consistency and a characteristic minutely pebbled surface
* sometimes you find brothers having the same problem, the inheritance is not clear though, it can be recessive or dominant or both , it can be associated with other syndromes.
* High recurrence rate , you probably need to do surgery, and maintain good oral hygiene.
* The tissues are very thick so it Retards teeth eruption, this is why sometimes you need to do surgery.
* It affects mastication, aesthetic.
* GE associated with *Tuberous sclerosis*: triad of epilepsy, mental deficiency and cutaneous angiofibromas
* Is it plaque induced?!

It has been shown that when u extract the tooth, the gingival enlargement regress, and goes back to its normal shape, so plaque may be an initiating factor.

* If you take **histological** sections

You’ll not see inflammation, but very thick layer of collagen, acanthosis and thickening of epithelium

1. ***ASSOCIATED WITH SYSTEMIC DISEASES or CONDITIONS( less common)***

It **caused by** either: plaque with factors that magnified the symptoms(hormones, nutritional deficiency, allergies..etc) or with other things that you have nothing to do with as leukemia

So as conclusion :

1) **Magnification** of an existing inflammation **initiated by** dental plaque

We call it (CONDITIONED ENLARGEMENT)

2**) Manifestation** of the systemic disease **independently** of the inflammatory status of the gingiva.

***Conditioned***🡪 Bacterial plaque is the initiator but not the sole determinant of the nature of the clinical features.

* **Enlargement Influenced by** the following factors:
  + **Hormonal**, like in pregnancy ( has more sever inflammation , redness and swelling ) and puberty,, ( so the plaque is the initiator but not the cause of the severe inflammation)=> called conditioned
  + **Nutritional**
  + **Allergic**
  + **nonspecific**

***Pregnancy*** ,how hormones affect the inflammation?, increase progesterone and estrogen levels, increase vascular permeability and proliferation of blood vessels, fibroblasts, collagen synthesis 🡪 exaggerated response of inflammation. **Most common in the 3rd trimester** in pregnancy.

Some people say that the bacteria itself differs, ***Prevotella Intermedia* is quite high,** **why?** Because this bacteria feed on steroidal hormones (progesterone, even testosterone sometimes).

**Clinical features:**

It might be

1. Marginal gingivitis: ( the most common ) up to70% of pregnant women have severe gingivitis, (bright red or magenta, soft, friable, easily bleeds).
2. May be generalized.
3. Tumor like enlargements (pregnancy tumours) ,, it is not a real malignant tumor , it is a granuloma

\*\*The **pregnancy tumor** occurs usually during **the first trimester**, *it’s dark red* 🡪 bcuz it’s vascular lesion, so bleeding is a problem, Enlargement is more common interproximal , in interdental areas and it gets flattened bcuz of the cheek, (**grows laterally**). it can be either sessile or pedunculated, , it’s a mushroom like flat lesion. it’s usually painless and not invasive ( do not degrade the bone ),, Again this is not specific to this case.

**Histology:** angiogranuloma : you find blood vessels with inflammatory cells caused by chronic mild irritation for prolonged time

**In contrast** polyp is a fibrous tissue ,and tumors is uncontrolled cell growth

*It is sort of Peripheral giant cell granuloma* looks similar to it, sometimes with different color, it can be more red, or same. But It's more aggressive , degrade interdental bone ( invades bone) , painless , while pregnancy tumor don't.

***When u treat it?***

You have to be conservative in treatment, don't do any surgeries, always **start** with **prevention**; oral hygiene, scaling and polishing, try not to let the gingiva grow,

Tell the patient to wait until birth, if the patient can’t tolerate it, excise it.  
but in general anything in pregnancy if you think it's elective, it’s better to postpone it.

After parturition, usually the lesion subsides spontaneously, or gets smaller.

* + during pregnancy is conservative, remove local irritants
  + Surgical removal during pregnancy 🡪recurrence
  + Spontaneous reduction in size after parturition

(Again like we said, It's not aggressive lesion, it doesn't invade bone, it may cause recession when u excise it.

Any inflammation makes the gingiva soft, so any occlosal force may cause drifting of teeth.)

**Puberty**; enlargement in puberty happens in both females and males, ex: 14 years old females with severe enlargement and bleeding, there is plaque and calculus but once you treat them it doesn’t really regress, these cases after puberty period regress by themselves. Treatment might help but it doesn’t really remove it completely. It happens mainly on the facial gingival at the interproximal papillas.

**Enlargement in Vit C deficiency ,** Rare, Scurvy, swelling and marginal inflammation, the consistency of the gingiva is different, it’s very soft (since vitamin C is involved in collagen production). the pt has problem with collagen so it is covered with pseudo membrane

***Allergic*** **, plasma cell gingivitis**( not really a swelling ) maybe due to a tooth paste allergy and it is not limited to interdental and marginal gingive , it affect the whole gingival and not related to plaque accumulation , , or **desquamated gingivitis**,, Its not a disease it’s a clinical manifestation of other diseases, its one of the manifestation of pemphigus valgaris, pemphygoid, lichen planus.

gingiva is fiery red all around, no keratinization, it’s desqumated, generalized .

it’s main cause is allergy (cinnamon, chewing gums, components of the toothpaste), it’s not really plaque induced, once you remove the cause usually you will get rid of it, histologically you’ll always **see plasma cells**, it’s not only involving the gingival sometimes it involves the alveolar mucosa so you have to think of allergy because it’s not plaque induced that reaches alveolar mucosa.

***Non-specific gingival enlargement***

***Pyogenic granuloma***

it’s also a vascular lesion,pregnancy tumor Like enlargement that occurs in the gingiva, it’s an exaggerated response to a minor trauma, diagnosis is based on history.

Treatment involves removing the local factors ( mouth wash , scaling and polishing ), and there is a high recurrence rate, so you have to do some root planning, and make sure you don’t leave and satellite cells behind.

***Systemic diseases that cause gingival enlargement ( as mentioned not related mainly to plaque )***

***\*Leukemia***

if there is sever over growth and you don't know the cause , take CBC to check this

immune cells 🡪 more inflammation

***Granulomatous diseases:***

such as crohn's disease , TB , sarcoidosis

1. Wegener’s granulomatosis:

necrotizing fascitits,

Oral features: ulcers, enlargement, tooth mobility, exfoliation and delayed

healing response.

1. Sarcoidosis

induced gingival enlargement, you can see there is no loss of bone levels, very severe enlargement of gingiva, and histologically the multinucleated giant cells. A picture showing very well resolution after treatment (gingivectomy)

1. ***Neoplastic enlargement (gingival tumours)***

Either 1***) benign tumors*** it can be fibroma , papilloma , giant cell granuloma , gingival cyst

***fibroma***, it’s a tumor that’s slowly growing from fibroblasts of the C.T of the gingiva or the PDL, it is usually pedunculated. ***Papilloma*** is not from the Connective tissue, it’s rather associated with epithelium, epithelial proliferation usually in the presence of Human papilloma virus (6,11) are most common in oral lesions. Usually it’s cauliflower or wart like lesion.

***Giant cell lesions*** are either in the jaws (central) or peripheral seen in the gingiva, it has different sizes and shapes, it’s usually painless, its important feature is that it destructs the bone, in addition to the presence of multinucleated giant cells histologically, this case of giant cell granuloma (pic), there is bone loss between the 2 teeth and histologically multinucleated giant cells.

Or 2)  ***malignant***

* Carcinoma
* Malignant melanoma.

Take a biopsy to know

1. ***False Enlargements***

Meaning you can see an enlargement of the gingiva but it’s not really the gingiva it’s the bone or the underlying teeth, for example you might think it is *exostosis, fibrous dysplasi*a, or *central giant cell granuloma* if it made a large expansion within the jaw.

an example of fibrous dysplasia, we have swelling in the molars region, and on the xray there is typical ground glass appearance.

Manegemnt :

* **Chronic Inflammatory:**
  1. OHI, Scaling and root planing
  2. **Surgical removal** if:
     + fibrous tissue that did not undergo shrinkage after scaling and root planning
     + are of such size that they obscure deposits on the tooth surface and interfere with access to them.
* **Leukemic:** 
  + You have to be Conservative to not cause a lot of bleeding
  + Progressive scaling at subsequent visit to facilitate control of bleeding.

(you have to do it in sequential manner every visit few teeth, to control bleeding).

* + Antibiotics ( prophylactic ) before and 48 after (give a 3 days course of antibiotics 1 day before and 2 days after treatment (since they have a high risk of infections & bleeding)
* **Pregnancy:**
* **prevention**/early removal of local irritants
* Gingivitis: **Scaling** and RP
* **Timing**: after the delivery, lesions should be removed surgically only if interferes with function or aesthetics
* Treatment of gingival disease should be done as early as possible.
* Periodic dental visits
* Full exam and radiographs after delivery.
* **Puberty:**
* Be Conservative , don't give antibiotic even if it sever inflammation
* **Drug induced**
* OHI
* CHX (chlorohexidine) rinses, to decrease plaque load, cause it’s really hard to go underneath
* SCRP , (scaling and root planning).
* Possible drug substitution
* Professional recalls , need to be seen a lot
* If persists and ivolve the bone 🡪 Surgical removal (Gingivectomy or flap procedures depending on area involved, presence of osseous defects and limited keratinised gingiva.
* Maintenance, the most important step is because there is a high risk of relapse, especially if the patient got lazy, it will surprise you how fast it grows back.

Recurrence in these cases is usually the main problem, we can’t really predict it, causes usually if it was inflammatory, is because you left something behind (calculus or plaque or some local factors like orthodontic braces, or faulty restorations) in this case you to do treatment again, remove granulation tissue and do scaling and root planning.

In **idiopathic fibromatosis**, you might need to do many surgeries and try to prevent secondary infections.

\*\*A case of chronic periodontitis with idiopathic enlargement after 1 year of treatment if healed quite well but the problem with idiopathic enlargement is recurrence so after 5 years you can see the swelling starting again but it’s not bad as it was and hygiene was not perfect so you might have relapse but still way better than it was before.

\*\* pregnancy tumor that was treated during pregnancy, it was really big and the patient couldn’t close her mouth, in this case it’s kind of a pyogenic ganuloma coz it bleeds a lot so in this case cauterization was done to control bleeding quite good.