Gingival Enlargement

Presented by:
Dr. Zeyad Nazar Majeed
Department of Periodontology
College of Dentistry/Babylon University

An increase in size of the gingiva is a common feature of gingival disease.

The accepted current terms for this condition are

The terms used in the past, such as hypertrophic gingivitis and gingival hyperplasia.

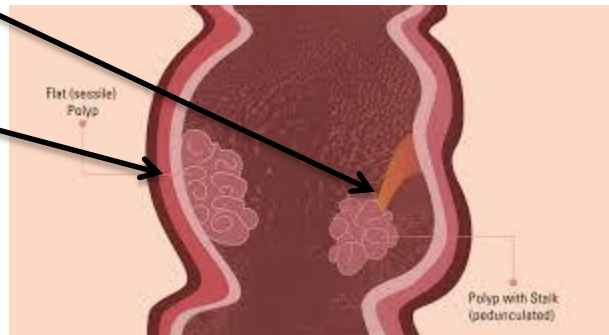
Types Of Gingival Enlargement

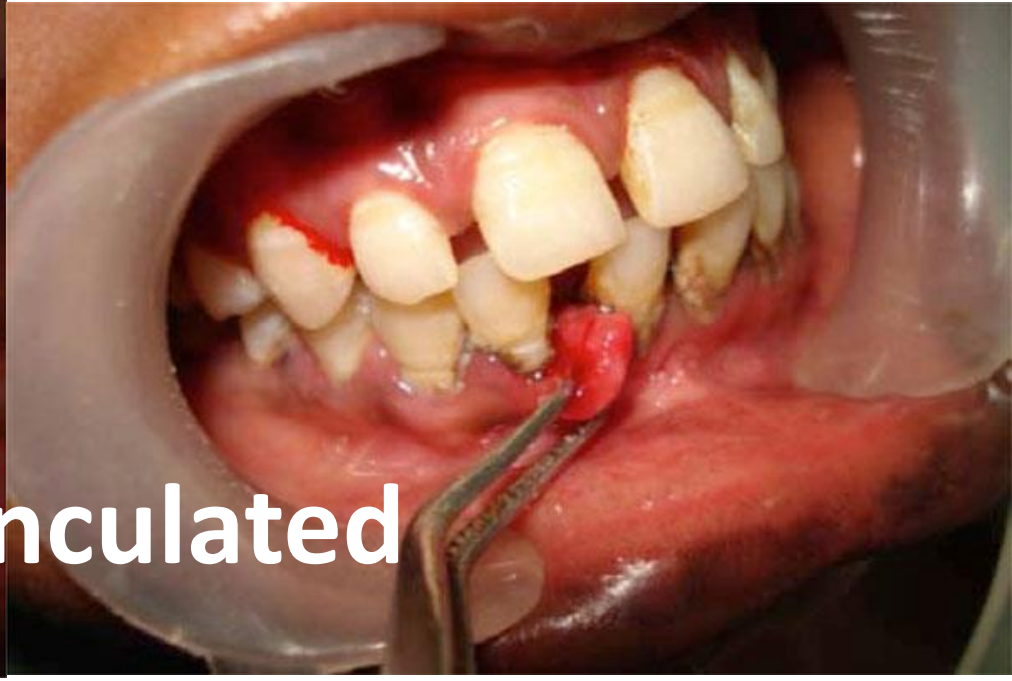
- Inflammatory Enlargement
  - Chronic Inflammatory Enlargement
  - Acute Inflammatory Enlargement
- Drug-induced Gingival Enlargement
  - General Information
  - Anticonvulsants
  - Immunosuppressants
  - Calcium Channel Blockers
- Idiopathic Gingival Enlargement
- Enlargements Associated With Systemic Diseases
  - Conditioned Enlargements
  - Systemic Diseases That Cause Gingival Enlargement
- Neoplastic Enlargement (Gingival Tumors)
  - Benign Tumors of the Gingiva
  - Malignant Tumors of the Gingiva
- False Enlargement

Location & Distribution

With the use of the criteria of location and distribution, gingival enlargement is designated as follows:

- **Localized: Limited to the gingiva adjacent to a single tooth or group of teeth**
- **Generalized: Involving the gingiva throughout the mouth**
- **Marginal: Confined to the marginal gingiva**
- **Papillary: Confined to the interdental papilla**
- **Diffuse: Involving the marginal and attached gingiva and papillae**
- **Discrete: An isolated sessile or a pedunculated, tumorlike enlargement**





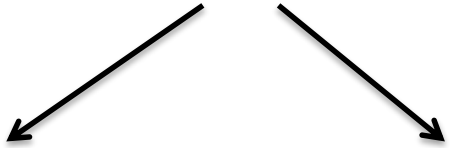
pedunculated

sessile

The degree of gingival enlargement can be scored as follows:-

- **Grade 0: No signs of gingival enlargement**
- **Grade I: Enlargement confined to interdental papilla**
- **Grade II: Enlargement involves papilla and marginal gingiva**
- **Grade III: Enlargement covers three quarters or more of the crown**

Inflammatory enlargement



A. Chronic **B. Acute**

Gingival enlargement may result from chronic or acute inflammatory changes,

although chronic changes are much more common.

In addition, inflammatory enlargements are usually a secondary complication of any of the other types of enlargement, thereby creating a combined gingival enlargement.

In these cases, it is important to understand the double etiology and to treat both causes adequately.

A-Chronic Inflammatory Enlargement

Clinical Features

Chronic inflammatory gingival enlargement originates as a slight ballooning of the interdental papilla and marginal gingiva.

In the early stages, it produces a life-preserver shaped bulge around the involved teeth. This bulge can increase in size until it covers part of the crowns.

The enlargement may be localized or generalized; it progresses slowly and painlessly, unless it is complicated by acute infection or trauma

Etiology

prolonged exposure to dental plaque.

Chronic inflammatory gingival enlargement localized to the anterior region.

Chronic inflammatory gingival enlargement

Gingival Changes Associated with Mouth Breathing

Gingivitis and gingival enlargement are often seen in patients who are mouth breathers. The gingiva appears red and edematous, with a diffuse surface shininess of the exposed area. The maxillary anterior region is the common site of such involvement.

B-Acute Inflammatory Enlargement

1-Gingival Abscess. **2-Periodontal (Lateral) Abscess.**

1-Gingival Abscess.

A gingival abscess is a localized, painful,rapidly expanding lesion that usually has a sudden onset.

It is generally limited to the marginal gingiva or the interdental papilla. In its early stages, it appears as a red swelling with a smooth, shiny surface. Within 24 to 48 hours, the lesion usually becomes fluctuant and pointed, with a surface orifice from which a purulent exudate may be expressed. The adjacent teeth are often sensitive to percussion. If permitted to progress, the lesion generally ruptures spontaneously.

Gingival abscesses may occur in the presence or absence of a periodontal pocket .

Etiology

- results from bacteria carried deep into the tissues when a foreign substance(e.g., toothbrush bristle, piece of apple core, lobster shell fragment) is forcefully embedded into the gingiva.

- The lesion is confined to the gingiva and should not be confused with periodontal or lateral abscesses.

B-Acute Inflammatory Enlargement

2-Periodontal (Lateral) Abscess.

Periodontal abscesses involve the supporting periodontal tissues and generally produce enlargement of the gingiva. Gingival abscesses may occur in the presence or absence of a periodontal pocket .

Periodontal abscess formation may occur in the following ways:

1. **Extension of infection from a periodontal pocket deeply into the supporting periodontal tissues and localization of the suppurative inflammatory process along the lateral aspect of the root.**

2. **Lateral extension of inflammation from the inner surface of a periodontal pocket into the connective tissue of the pocket wall . Formation of the abscess results when drainage into the pocket space is impaired.**

3. **Formation in a pocket with a tortuous course around the root . A periodontal abscess may form in the cul-de-sac, the deep end of which is shut off from the surface.**

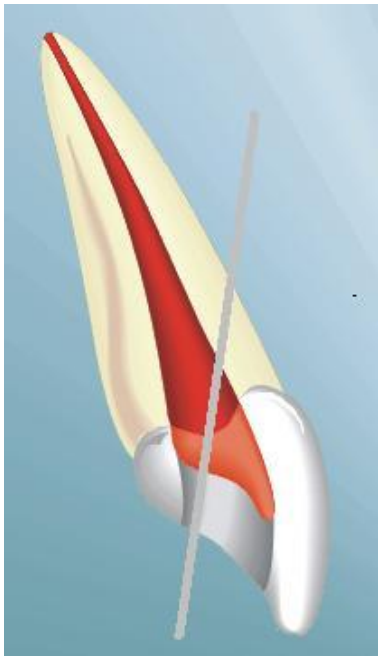
4. **Incomplete removal of calculus during treatment of a periodontal pocket. The gingival wall shrinks, thereby occluding the pocket orifice, and a periodontal abscess occurs in the sealed-off portion of the pocket.**

5. **After trauma to the tooth or with perforation of the lateral wall of the root in endodontic therapy. In these situations, a periodontal abscess may occur in the absence of periodontal disease.**

Root canal perforation

- **Perforation of the root creates a communication between the root canal system and periodontal ligament**

- **Due to over instrumentation during endodontic procedures, internal or external root resorption or caries invading through the floor of the pulp chamber**



2-Drug-Induced Gingival Enlargement

1

Anticonvulsants,

2

Immunosuppressants

3

Calcium Channel Blockers

2-Drug-Induced Gingival Enlargement

Clinical Features.

The growth starts as a painless, beadlike enlargement of the interdental papilla that then extends to the facial and lingual gingival margins .

As the condition progresses,the marginal and papillary enlargements unite, and they may develop into a massive tissue fold that covers a considerable portion of the crowns; this may interfere with occlusion.

- The enlargement is usually generalized throughout the mouth,but it is more severe in the maxillary and mandibular anterior regions.

-It occurs in areas in which teeth are present (not in edentulous spaces), and the enlargement disappears in areas from which teeth have been extracted.

-Hyperplasia of the mucosa in edentulous mouths has been reported but is rare.

- Drug-induced enlargement may occur in mouths with little or no plaque, and it may be absent in mouths with abundant deposits.

Oral hygiene by means of toothbrushing or the use of a chlorhexidine Toothpaste reduces the inflammation but does not lessen or prevent the overgrowth.

Different types of DIGO lesions demonstrate a thick, stratified squamous epithelium with long, thin rete pegs extending deep into the connective tissue.

A genetic predisposition is a suspected factor for determining whether a person treated with phenytoin will develop gingival enlargement.

The enlargement is chronic, and it slowly increases in size.

Even if it is surgically removed, it recurs.

Spontaneous disappearance occurs within a few months after the discontinuation of the drug.

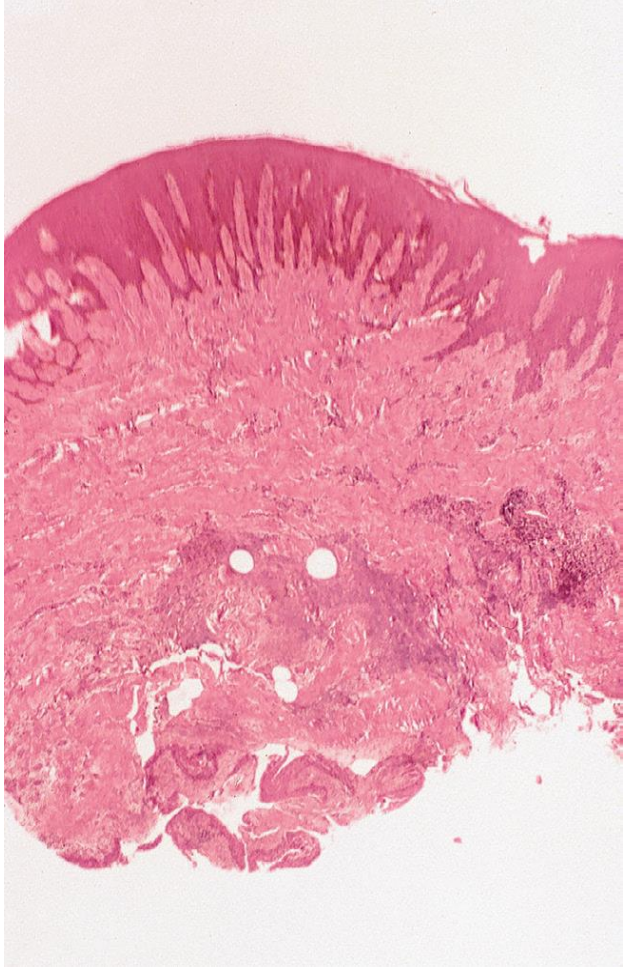
2-Drug-Induced Gingival Enlargement

1-Anticonvulsants

treatment of epilepsy,

phenytoin (Dilantin), ethotoin (Peganone), mephenytoin (Mesantoin), succinimides (ethosuximide [Zarontin], methsuximide [Celontin]), and valproic acid [Depakene])

- occurs in about 50% of patients receiving the drug
- the pathogenesis of gingival enlargement induced by phenytoin is not known, but some evidence links it to a direct effect on specific, genetically predetermined subpopulations of fibroblasts, inactivation of collagenase, and plaque-induced inflammation.



A B

Microscopic view of gingival enlargement associated with phenytoin therapy.

A, Hyperplasia and acanthosis of the epithelium and densely collagenous connective tissue, with evidence of inflammation in the area adjacent to the gingival sulcus (pocket).

B, High-power view showing the extension of deep rete pegs into the connective tissue.

Fig. 19.8 Phenytoin-induced gingival enlargement.

Fig. 19.9 Combined gingival enlargement resulted from the inflammatory involvement of a phenytoin-induced overgrowth.

2-Drug-Induced Gingival Enlargement

1-Anticonvulsants

2-Immunosuppressants

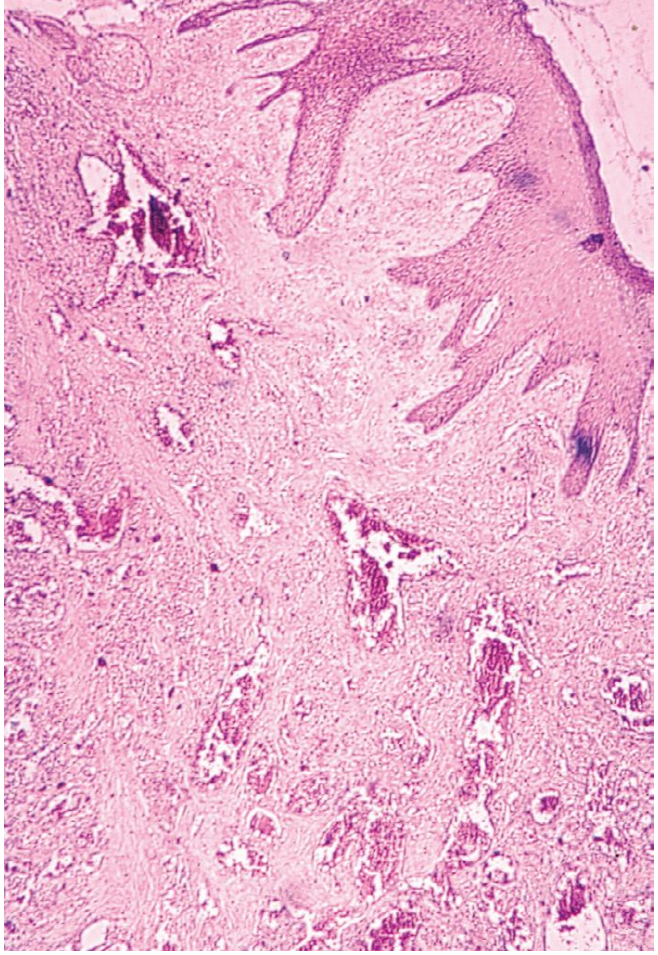
Cyclosporine is a potent immunosuppressive agent that is used to prevent organ transplant rejection and to treat several diseases of autoimmune origin.

Its exact mechanism of action is not well known, but it appears to selectively and reversibly inhibit helper T cells, which play a role in cellular and humoral immune responses.

Cyclosporine-associated gingival enlargement.

A, Mild involvement located particularly on the papillae between teeth #9 and #10 and teeth #10 and #11.

B, Advanced generalized enlargement.



Microscopic view of cyclosporine-associated gingival enlargement. Note the epithelial hyperplasia and fibrous stroma with abundant vascularization.

2-Drug-Induced Gingival Enlargement

1- Anticonvulsants,

2-Immunosuppressants

3-Calcium Channel Blockers

Are drugs that were developed for the treatment of cardiovascular conditions such as(hypertension, angina pectoris, coronary artery spasms, and cardiac arrhythmias).

Some of these drugs can induce gingival enlargement. Nifedipine,which is one of the most often used, induces gingival enlargement in 20% of patients.

Nifedipine-induced GO can coexist with periodontitis and attachment loss that is different from other forms of DIGO.

3-Idiopathic Gingival Enlargement

Clinical Features.

- The enlargement affects the attached gingiva as well as the gingival margin and the interdental papillae.

This is in contrast with phenytoin-induced overgrowth, which is often limited to the gingival margin and the interdental papillae .

- The facial and lingual surfaces of the mandible and maxilla are generally affected, but the involvement may be limited to either jaw.

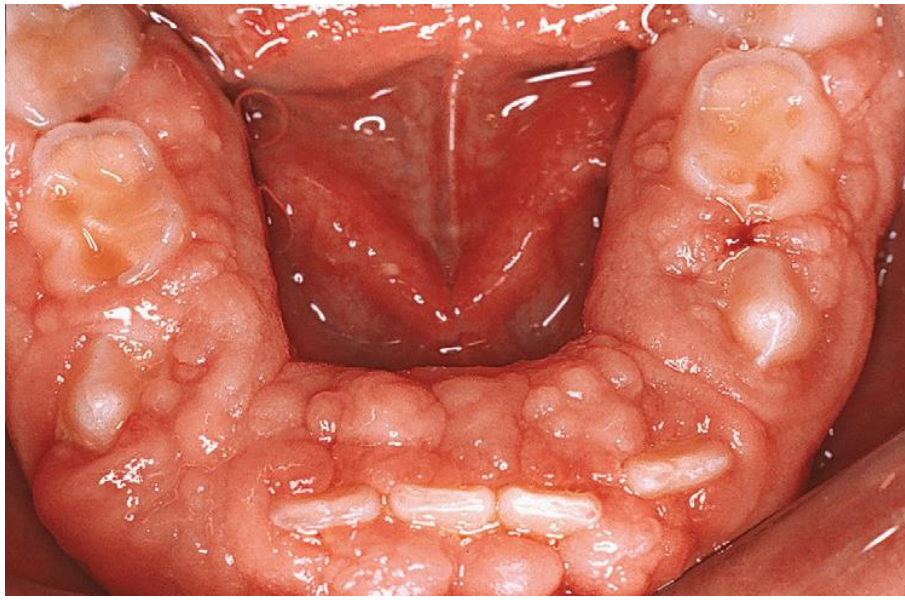
- The enlarged gingiva is pink, firm, and almost leathery in consistency, and it has a characteristic minutely pebbled surface .

- In severe cases, the teeth are almost completely covered, and the enlargement projects into the oral vestibule.

3-Idiopathic Gingival Enlargement

Etiology. **The cause is unknown, and thus the condition is designated as "idiopathic." Some cases have a hereditary basis ,but the genetic mechanisms involved are not well understood**

A



B

Idiopathic gingival enlargement in 14-year-old white male patient.
A, Facial view. The gingiva is firm, with a nodular, pebbled surface and partially covering the crowns of the teeth.
B, Occlusal view of the lower jaw.

Types Of Gingival Enlargement

- Inflammatory Enlargement
  - Chronic Inflammatory Enlargement
  - Acute Inflammatory Enlargement
- Drug-induced Gingival Enlargement
  - General Information
  - Anticonvulsants
  - Immunosuppressants
  - Calcium Channel Blockers
- Idiopathic Gingival Enlargement
- Enlargements Associated With Systemic Diseases
  - Conditioned Enlargements
  - Systemic Diseases That Cause Gingival Enlargement
- Neoplastic Enlargement (Gingival Tumors)
  - Benign Tumors of the Gingiva
  - Malignant Tumors of the Gingiva
- False Enlargement

4-Enlargements Associated with Systemic Diseases

- **A. Conditioned Enlargements**

1. Enlargement in Pregnancy
2. Enlargement in Puberty.
3. Enlargement in Vitamin C Deficiency.
4. Nonspecific Conditioned Enlargement (Pyogenic Granuloma).

B. The systemic disease independently of the inflammatory status of the gingiva

These mechanisms are described in the:-

- Systemic Diseases that Cause Gingival Enlargement section &

- the Neoplastic Enlargement (Gingival Tumors) section.

4-Enlargements Associated with Systemic Diseases

Conditioned Enlargements

1-Enlargement in Pregnancy

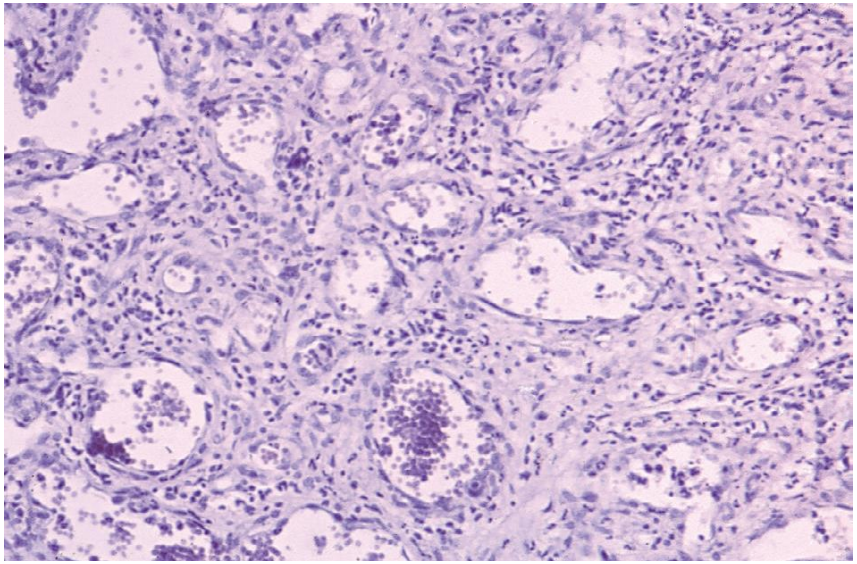
Pregnancy gingival enlargement may be marginal and generalized, or it may occur as a single mass or multiple tumorlike masses .

During pregnancy, there is an increase in levels of both progesterone and estrogen, which by the end of the third trimester reach levels 10 and 30 times the levels present during the menstrual cycle, respectively.

These hormonal changes induce changes in vascular permeability, which leads to gingival edema and an increased inflammatory response to dental plaque. The subgingival microbiota may also undergo changes, including an increase in Prevotella intermedia.

Conditioned Enlargements
Enlargement in Pregnancy

Localized gingival enlargement in a 27-year-old pregnant patient.



Microscopic view of gingival enlargement in pregnant patient showing an abundance of blood vessels and interspersed inflammatory cells.

Conditioned Enlargements

1. Enlargement in Pregnancy

2. Enlargement in Puberty.

Enlargement of the gingiva is sometimes seen during puberty . It occurs in both male and female adolescents, and it appears in areas of plaque accumulation.

It is marginal and interdental, and it is characterized by prominent bulbous interproximal papillae . Often, only the facial gingivae are enlarged, and the lingual surfaces are relatively unaltered; the mechanical action of the tongue and the excursion of food prevent a heavy accumulation of local irritants on the lingual surface.

After puberty, the enlargement undergoes spontaneous reduction, but does not disappear completely until the plaque and calculus are removed.

Conditioned gingival enlargement during puberty in a 13-year-old boy.

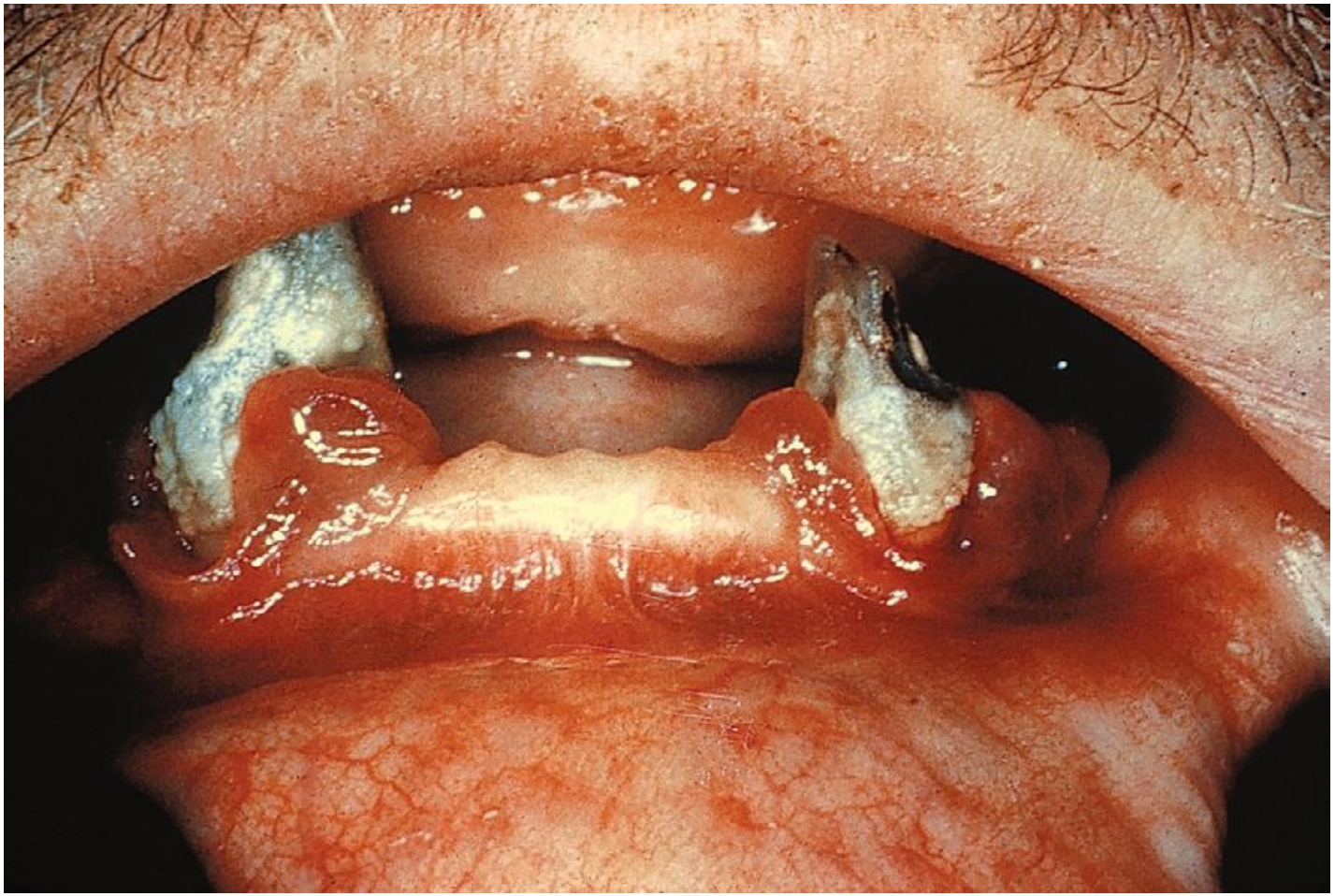
Conditioned Enlargements

1. Enlargement in Pregnancy
2. Enlargement in Puberty.
3. Enlargement in Vitamin C Deficiency.

Acute vitamin C deficiency itself does not cause gingival inflammation, but it does cause hemorrhage, collagen degeneration, and edema of the gingival connective tissue. These changes modify the response of the gingiva to plaque to the extent that the normal defensive delimiting reaction is inhibited and the extent of the inflammation is exaggerated,thereby resulting in the massive gingival enlargement seen in patients with scurvy

Gingival enlargement with vitamin C deficiency is marginal; the gingiva is bluish red, soft, and friable, and it has a smooth,shiny surface. Hemorrhage that occurs either spontaneously or on slight provocation as well as surface necrosis with pseudomembrane formation are common features.

Gingival enlargement in a patient with vitamin C deficiency. Note the prominent hemorrhagic areas.



Conditioned Enlargements

1- Enlargement in Pregnancy
2- Enlargement in Puberty.
3- Enlargement in Vitamin C Deficiency.

4-Nonspecific Conditioned Enlargement (Pyogenic Granuloma).

Pyogenic granuloma is a tumorlike gingival enlargement that is considered an exaggerated conditioned response to minor trauma.

The exact nature of the systemic conditioning factor has not been identified.

Pyogenic granuloma is similar in clinical and microscopic appearance to the conditioned gingival enlargement seen during pregnancy.

The differential diagnosis is based on the patient's history.

Treatment consists of the removal of the lesions plus the elimination of irritating local factors. The recurrence rate is about 15%.

Pyogenic granuloma.

5-Neoplastic Enlargement (Gingival Tumors)

---- Benign Tumors of the Gingiva:-

1-Fibroma

2-Papilloma

3-Peripheral Giant Cell Granuloma

----Malignant Tumors of the Gingiva:-

1-Carcinoma.

2-Malignant Melanoma

Fibroma

Fibromas of the gingiva arise from the gingival connective tissue or from the periodontal ligament.

They are slow growing spherical tumors that tend to be firm and nodular but that may be soft and vascular.

Fibromas are usually pedunculated. Hard fibromas of the gingiva are rare; most of the lesions that are diagnosed clinically as “fibromas” are inflammatory enlargements

The so-called giant cell fibroma contains multinucleated fibroblasts.

In another variant, mineralized tissue (bone, cementum-like material, and dystrophic calcifications) may be found; this type of fibroma is called peripheral ossifying fibroma.

Papilloma

Papillomas are benign proliferations of surface epithelium that are, in many (but not all) cases, associated with the human papillomavirus (HPV).

Gingival papillomas appear as solitary wart like or cauliflower-like protuberances .

They may be small and discrete, or they may be broad, hard elevations with minutely irregular surfaces.

Papilloma of the gingiva in a 26-year-old man

Peripheral Giant Cell Granuloma

Arise interdentally or from the gingival margin;they occur most frequently on the labial surface, and they may be sessile or pedunculated.

They vary in appearance from smooth,regularly outlined masses to irregularly shaped, multilobulated protuberances with surface indentations .

The ulceration of the margin is occasionally seen. The lesions are painless, they vary in size, and they may cover several teeth.

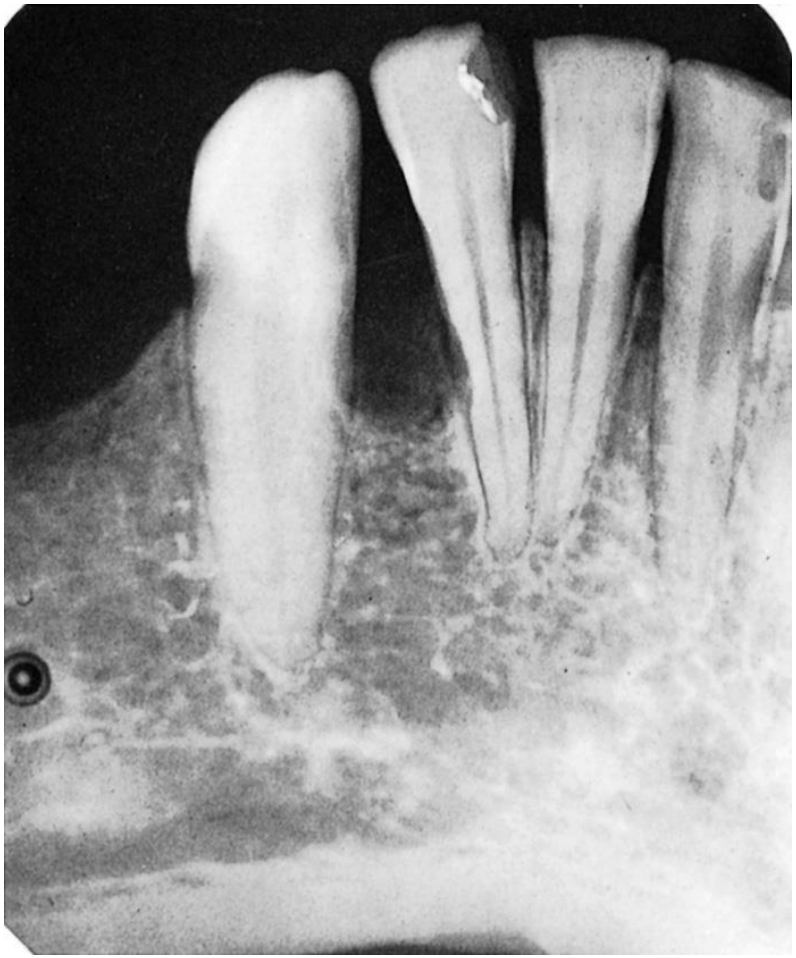
They may be firm or spongy, and their color varies from pink to deep red or purplish blue.

Microscopic examination is required for definitive diagnosis.

The prefix peripheral is needed to differentiate them from comparable lesions that originate within the jawbone (i.e., central giant cell granulomas).

In some cases, the giant cell granuloma of the gingiva is locally invasive and causes destruction of the underlying bone .

Bone destruction in the interproximal space between the canine and lateral incisor caused by the extension of a peripheral giant cell reparative granuloma of the gingiva.



Neoplastic Enlargement (Gingival Tumors)

Benign Tumors of the Gingiva

- Leukoplakia

- Gingival Cyst
- Other Benign Masses

  nevus, myoblastoma, hemangioma, neurilemoma, neurofibroma, mucus-secreting cysts (mucoceles), and ameloblastoma

Leukoplakia

Leukoplakia is a strictly clinical term defined by the World Health Organization (WHO)as a white patch or plaque that does not rub off and that cannot be diagnosed as any other disease.

The cause of leukoplakia remains obscure, although it is associated with the use of tobacco (smoke or smokeless). Other probable factors are Candida albicans, HPV-16 and HPV-18, and trauma.

Leukoplakia of the gingiva varies in appearance from a grayish white,flattened, scaly lesion to a thick, irregularly shaped,keratinous plaque.

Most leukoplakias (80%) are benign; the remaining 20% are malignant or premalignant, and only 3% of these are invasive carcinomas.

The biopsy of all leukoplakias is necessary, with the most suspicious area being selected, to arrive at a correct diagnosis and to then institute proper therapy.

Gingival Cyst

Gingival cysts of microscopic proportions are common, but they seldom reach a clinically significant size.

When they do, they appear as localized enlargements that may involve the marginal and attached gingiva. The cysts occur in the mandibular canine and premolar areas, most often on the lingual surface. They are painless, but, with expansion, they may cause erosion of the surface of the alveolar bone.

The gingival cyst should be differentiated from the lateral periodontal cyst ,which arises within the alveolar bone adjacent to the root and which is developmental in origin.

Gingival cysts develop from odontogenic epithelium or from surface or sulcular epithelium traumatically implanted in the area. Removal is followed by uneventful recovery.

Malignant Tumors of the Gingiva

Carcinoma

Oral cancer accounts for less than 3% of all malignant tumors in the body, but it is the sixth most common cancer in males and the twelfth most common in females.

The gingiva is not a frequent site of oral malignancy, accounting for only 6% of oral cancers.

Squamous cell carcinoma is the most common malignant tumor of the gingiva. It may be exophytic , presenting as an irregular outgrowth, or ulcerative, appearing as flat, erosive lesions.

It is often symptom free, going unnoticed until complicated by inflammatory changes that may mask the neoplasm but cause pain; sometimes it becomes evident after tooth extraction.

These masses are locally invasive, and they involve the underlying bone and periodontal ligament of adjoining teeth and the adjacent mucosa .

Metastasis is usually confined to the region above the clavicle; however, more extensive involvement may include the lung, liver, or bone.

Squamous cell carcinoma of the gingiva

A, Facial view. Note the extensive verrucous involvement.

B, Palatal view. Note the mulberry -like tissue emerging between the second premolar and the first molar.

Malignant melanoma

Is a rare oral tumor that tends to occur in the hard palate and maxillary gingiva of older persons.

It is usually darkly pigmented, and it is often preceded by localized pigmentation.

It may be flat or nodular, and it is characterized by rapid growth and early metastasis.

It arises from melanoblasts in the gingiva, cheek, or palate.

Infiltration into the underlying bone and metastasis to cervical and axillary lymph nodes are common.

Sarcoma. Fibrosarcoma, lymphosarcoma, and reticulum cell sarcoma of the gingiva are rare;

Kaposi's sarcoma often occurs in the oral cavity of patients with acquired immunodeficiency syndrome, particularly in the palate and the gingiva .

Metastasis. Tumor metastasis to the gingiva occurs infrequently.

Such metastasis has been reported with various tumors, including adenocarcinoma of the colon,lung carcinoma, melanoma,renal cell carcinoma,hypernephroma,chondrosarcoma, and testicular tumor.

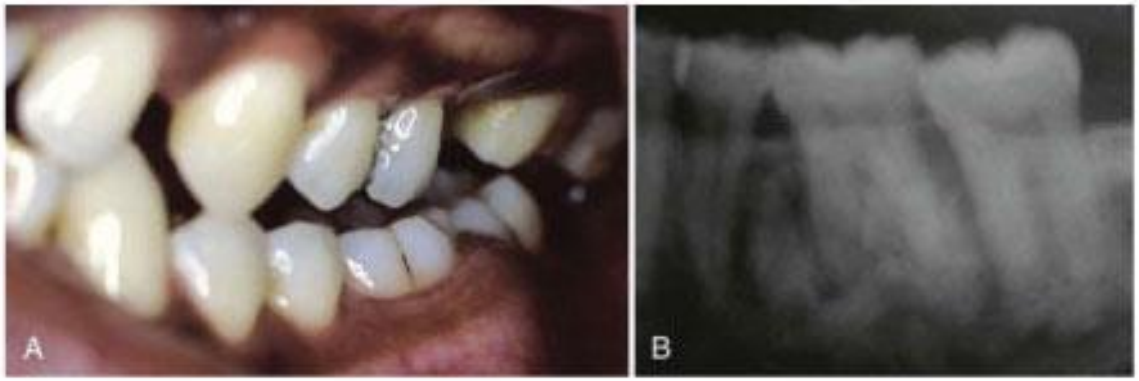
The low incidence of oral malignancy should not mislead the clinician.

Ulcerations that do not respond to therapy in the usual manner as well as all gingival tumors and tumorlike lesions must be biopsied and submitted for microscopic diagnosis .

False Enlargement

Underlying Osseous Lesions

–occurs most often in *tori* and *exostoses,* but it can also occur in Paget's disease, fibrous dysplasia, cherubism, central giant cell granuloma, ameloblastoma, osteoma, and osteosarcoma



Fibrous dysplasia (florid type) in a 38-year-old black female

False Enlargement

Underlying Dental Tissues

–often occur during the various stages of eruption, particularly of the primary dentition

–termed *developmental enlargement*

Developmental gingival enlargement

Patient: 25-year-old female

Chief Complaint: "My teeth move, and my gums are swollen."

Background Information

Patient does not receive any antiepileptic, antihypertensive, or immunosuppressive medications known to cause fibrotic changes in the gingiva. Possible systemic diseases such as leukemia were ruled out after consultation with the referring physician and based on laboratory analyses of peripheral blood. Local factors, such as mouth breathing or overhanging restorations, are not contributory.

Current Findings: Intraoral examination reveals moderate to severe gingival overgrowth, particularly in the maxillary and mandibular anterior areas. Significant and generalized periodontal probing depths and severe generalized bone loss were observed. Available immediate family members of the patient, her mother and her brother, were examined; both exhibited clinically significant gingival overgrowth. In addition to overgrowth, the patient's brother had significant bone loss around incisors and first molars. A family pedigree is created.

1. What is the preliminary diagnosis for gingival overgrowth?
   A. Drug-induced gingival overgrowth
   B. Hereditary gingival fibromatosis
   C. Idiopathic gingival overgrowth

---

2. Considering the age, clinical findings, and extent of bone loss, what is the preliminary diagnosis for periodontitis?
   A. Aggressive periodontitis
   B. Chronic periodontitis

---

3. What would the treatment plan include for long-term maintenance of outcomes?
   A. Surgical removal of overgrowth
   B. Regenerative treatment
   C. Anti-infective treatment
   D. Orthodontic treatment
   E. Implants
   F. All of the above

Answer: B

Explanation: Hereditary gingival fibromatosis is a non–drug-induced fibrotic form of gingival overgrowth with strong familial linkage.

Answer: A

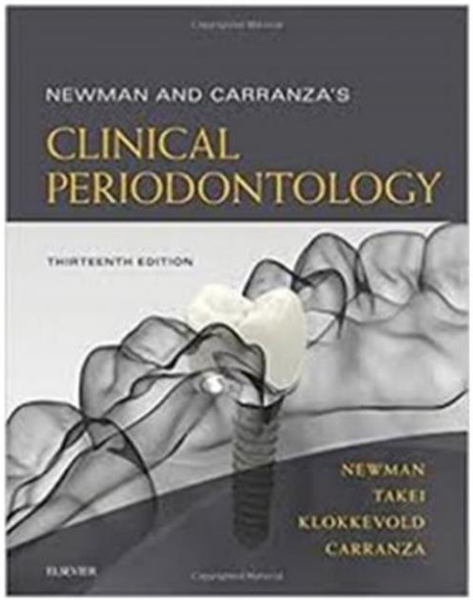
Explanation: Extent of bone loss is severe and suggests that periodontal bone loss is aggressive.

Answer: F

Explanation: This is a complex case of hereditary gingival fibromatosis and aggressive periodontitis. Treatment outcomes should be maintained by a multidisciplinary approach.

References

Chapter 19, page 256



Carranza's Clinical Periodontology
13th Edition

THANK YOU