

Firm Gingival Enlargement of the Anterior Maxilla

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The following Case Challenge is provided in conjunction with the American Academy of Oral and Maxillofacial Pathology.

Case Summary

This case challenge presents a partially edentulous occlusion with a well-demarcated gingival enlargement on the right anterior gingiva.

A healthy 56-year old African American woman was concerned about a large growth of the maxillary gingiva. Specifically, this gingival enlargement interfered with the wearing of a removable partial denture and was causing a distortion of the upper lip that affected her facial appearance.

After you have finished reviewing the available diagnostic information, make the diagnosis.

Diagnostic Information

History of Present Illness

Although the gingival enlargement had been present for about 10 years, recently, it had increased in size. The gingival protuberance was only slightly tender when she occluded on the soft tissue. She was unaware of bleeding, purulence, or surface changes at this site, but the adjacent teeth were slightly mobile and sensitive during mastication. The patient wore an interim, maxillary partial prosthesis that was ill fitting. The clasp adjacent to the gingival mass had been removed several years ago, so that she could increase the longevity of the temporary appliance. Previously, she had sought treatment for the lesion, but she was informed that it represented excessive bone growth and did not require removal.

Medical History

Review of the patient's medical history revealed that she was healthy, except for occasional episodes of chronic sinusitis. She had no known allergies to foods or medications, although she suspected that she had some environmental allergies to molds and pollen. Infrequently, she took ibuprofen when she had sinus or stress-induced headaches.

Clinical Examination Findings

On inspection, a 2.0 x 3.0 cm exophytic lesion was identified on the right facial gingiva and alveolar mucosa, adjacent to the lateral incisor and canine. (Figure 2) This sessile, nontender nodule was firm and rubbery to palpation. The surface mucosa was smooth and intact with a patchy light brown pigmentation. Both the lateral incisor and canine exhibited Class I mobility. In addition to a large diastema between these anterior teeth, the canine was displaced slightly toward the palate. (Figure 3) Periodontal examination of the involved teeth revealed probing depths that were < 3mm and attachment levels were affected minimally. Comprehensive intraoral examination revealed multiple missing teeth, numerous carious lesions, and mild chronic periodontitis. No other soft tissue lesions were identified in the head and neck region, although several keloids were documented on the skin of the extremities.



Figure 1. Partially edentulous occlusion with a well-demarcated gingival enlargement on the right anterior gingiva.



Figure 2. Labial view of the sessile gingival nodule with a smooth surface.



Figure 3. Occlusal view of the gingival mass, exhibiting displacement of the maxillary lateral incisor and canine.

Radiographic Findings

A periapical radiograph demonstrated an irregular, radiopaque focus within the soft tissue mass between the lateral incisor and canine. (Figure 4) The periodontal ligament space was widened slightly on the mesial aspect of the canine, while dentinal caries was detected on the distal surface of this tooth. A modified periapical view showed a crescent shaped opacity that was mesial and distal to the canine. (Figure 5) Except for mild loss of alveolar crestal bone height, no other bony findings were identified.

Incisional Biopsy and Photomicrographs

Due to the significant size of the lesion, an incisional biopsy was performed under local anesthesia for a definitive diagnosis. A crescent-shaped tissue sample was obtained adjacent to the canine with extension to the alveolar crestal



Figure 4. Periapical radiograph of the maxillary incisor-canine region, showing an irregular opaque focus within the soft tissue enlargement.



Figure 5. Modified occlusal radiograph of the maxillary incisor-canine region, exhibiting crescent-shaped opacities in the interproximal soft tissue adjacent to the canine.

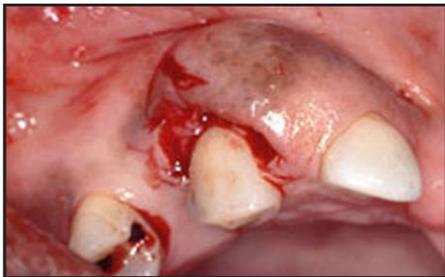


Figure 6. Incisional biopsy of the gingival mass.

bone. (Figure 6) The surgical incision was not obvious clinically with normal lip movements and only direct pressure to the site was needed for hemostasis.

Microscopic examination revealed a wedge of gingiva, consisting of cellular fibrous connective tissue that contained foci of mineralized product. (Figure 7) Both trabeculae of bone (Figure 8) and globules of cementum-like material (Figure 9) were interspersed within the stroma. Occasionally, multinucleated giant cells were seen in close proximity to the mineralized tissue.

One Month Follow-up

The patient delayed treatment because she was anxious about the surgical procedure and was concerned she would prematurely lose

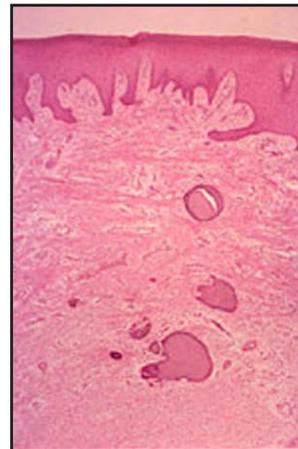


Figure 7. Low power photomicrograph showing surface epithelium and islands of mineralized material in the underlying connective tissue.



Figure 8. Medium power photomicrograph showing bony trabeculae within a background of moderately dense fibrous connective tissue.

additional anterior teeth. She returned in one month because the lesion was increasing in size (Figure 10) with increased erythema and bleeding at the biopsy site. (Figure 11)

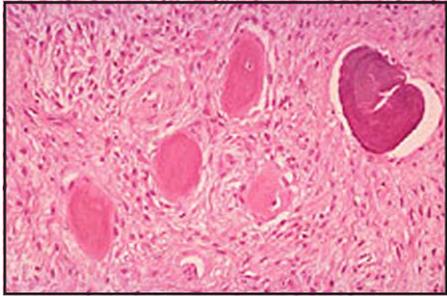


Figure 9. High power photomicrograph showing droplets of cementum-like material within the connective tissue.



Figure 10. Labial view, one month following the incisional biopsy.



Figure 11. Occlusal view, one month following the incisional biopsy.

Can you make the diagnosis?

This case challenge presents a partially edentulous occlusion with a well-demarcated gingival enlargement on the right anterior gingiva.



Select the Correct Diagnosis

- A. Buccal Exostosis
- B. Extrasosseous Calcifying Odontogenic Cyst
- C. Peripheral Ossifying Fibroma
- D. Peripheral Osteosarcoma
- E. Cutright Lesion

Buccal Exostosis

Choice A. Sorry, this is not the correct diagnosis.

Buccal exostosis is a localized bony protuberance that arises from the cortical plate.¹ Usually multiple in number, these hard nodules are found in the facial alveolar ridge. They are slow growing and nontender, unless the overlying mucosa is traumatized. Occasionally, single nodules develop in response to irritation,

especially beneath tissue grafts that may stimulate new bone formation. Radiographically, the buccal exostosis appears as a radiopacity superimposed over the mid-root region. In contrast to the present case, mobility and displacement of teeth are not features of this entity. Microscopic examination of the exostosis reveals a dense mass of lamellar or cortical bone with minimal fibrofatty marrow.

Please re-evaluate the information about this case.

Extrasosseous Calcifying Odontogenic Cyst

Choice B. Sorry, this is not the correct diagnosis.

The extrasosseous calcifying odontogenic cyst (ECOC) is a rare gingival lesion that has been referred to as the dentinogenic ghost cell tumor and the epithelial odontogenic ghost cell tumor.² Most lesions are located in the gingiva or alveolar mucosa, anterior to the first molar with a slight predilection for the mandible. Although the age

range is wide, most are diagnosed in the sixth through eighth decades. Clinically, the ECOC is described as a solitary, smooth surfaced nodule that is painless. Infrequently, displacement of teeth has been reported. Radiographic findings include saucerization of the alveolar bone with or without fine flecks of calcification. Microscopically, most peripheral lesions are characterized by islands of odontogenic epithelium that resemble an ameloblastoma in a fibrous stroma. Foci of ghost cells and dentinoid are often present.

Please re-evaluate the information about this case.

Peripheral Ossifying Fibroma

Choice E. Congratulations! You are correct.

Discussion

The peripheral ossifying fibroma (POF) is a common, reactive gingival growth that contains varying amounts of mineralized product and is believed to arise from the periosteum or periodontal ligament.⁷ Usually originating from the interdental papilla, this firm, well-demarcated nodule has a smooth to bosselated surface that is pink or red in color. Sometimes the lesion extends interproximally, creating a crescent-shaped or bilobed appearance. Early or traumatized lesions frequently are inflamed and ulcerated, while mature lesions tend to have a pink, intact surface. Most lesions are less than 2 cm in size but giant examples have been reported.⁸ Typically the POF exhibits a moderate growth rate and reaches its maximum size within several weeks to months. Except for bleeding associated with early or traumatized enlargements, most lesions are asymptomatic. Large nodules may interfere with occlusion or distort facial contours. Superficial erosion of the alveolar bone, displacement and loosening of teeth, and widening of the cervical one-third of the periodontal ligament space are uncommon, unless the lesion is long-standing.

The POF is diagnosed primarily in children and young adults with the peak prevalence in the second decade.^{9,11} As with many reactive gingival lesions, most cases are found in females. When evaluating race, all large series from North America show that whites make up the majority of biopsied lesions,^{9,11} however, about one-third of the POFs are documented in blacks.^{9,11} This entity is seen exclusively on the gingiva, especially the incisor-canine region, with a slight predilection for the maxilla. Dental calculus, plaque, removable appliances, poorly-contoured crowns and restorations, and carious or fractured teeth are important causative irritants. In addition to determining if local contributing factors are present, a periapical or bite-wing radiograph may demonstrate calcification within the soft tissue mass, especially in mature lesions.

Histopathologically, the POF is characterized by a fibrous proliferation associated with the formation

of mineralized product. The surface epithelium may be intact or ulcerated with subjacent granulation tissue. The fibroblastic components are plump and cellular, especially in areas of product formation. The mineralized component includes dystrophic calcification, cementum-like material and woven or trabecular bone.¹⁰ Foci of unmineralized osteoid are found frequently in the stroma. Occasionally, multinucleated giant cells are present at the base of the lesion or in close proximity to the mineralized product.

Treatment of the lesion includes local surgical excision, along with histopathologic examination. The mass should be excised down to periosteum, in addition to thorough scaling of the adjacent teeth. Furthermore, the correction or removal of contributing factors should be addressed to prevent recurrences. Overall, the recurrence rate of the POF is approximately 16%¹⁰ and multiple recurrences have been reported.^{9,10} Extraction of involved teeth is rarely necessary. At least in children, most lesions that recur will do so within 12 months following lesion removal.⁹

Local surgical excision is the only way to manage this gingival enlargement, and the removal of sizeable lesions, especially in the anterior maxillary region, may produce a significant cosmetic problem and compromise the health of the periodontium. Marked gingival recession, lack of keratinized tissue, bony fenestration, and root sensitivity are potential postsurgical complications that need to be addressed. Following the removal of a POF, esthetic defects can be corrected using plastic periodontal surgery procedures such as a laterally positioned flap, a subepithelial connective tissue graft, and a coronally positioned flap.¹² Although these autografts are associated with a high success rate, the procedure requires a second surgical site, i.e., donor site, resulting in increased surgical time and discomfort to the patient. In addition, the gingival donor graft may not blend cosmetically into the recipient site. Depending on the size of the defect, it may not be feasible to obtain enough donor tissue to cover adequately the affected area.

Alternatively, AlloDerm® (LifeCell Corp. Branchburg, NJ USA), an acellular dermal graft, addresses some of the problems associated with the autografting procedure.^{13,14} The advantages of

this material are that there is an adequate amount of graft; it eliminates the need for a second surgical site; it has good handling characteristics; and it is non-immunogenic. The cost of the material and delayed healing response are the main disadvantages. An acellular dermal graft was used in this patient because of the size of the defect, the anxiety of the patient about the surgery, and the concern that the palatal donor graft would not provide optimal cosmetic results.

Surgical Excision of the Lesion

Following local anesthesia, a crestal incision was placed from distal of right maxillary canine and extending intrasulcularly along the labial of this tooth to the mesial of the right lateral incisor. Additional incisions were placed at the lateral and apical aspect of the lesion, in both the gingiva and alveolar mucosa, in order to aid in the removal of the tissue mass. (Figure 12) After the lesion was excised, an osteoplasty was performed to eliminate all bony ledges (Figure 13) and, subsequently, scaling and root planing were performed on the adjacent teeth.

AlloDerm® graft, measuring approximately 1 X 3 cm, was placed over the denuded bone and secured and stabilized with six single interrupted

Vicryl™ 4-0 sutures (Ethicon, Inc. Somerville, NJ USA) at the lateral and apical periphery. Two additional suspensory sutures were placed around the crowns of canine and lateral incisor. (Figure 14) Once the graft was secured, a periodontal dressing, Coe-Pak™ (GC America, Inc. Alsip, IL USA), was placed over the entire surgical site. Prior to dismissal, the patient received prescriptions for control of postoperative pain and inflammation and was instructed to use 0.12% chlorhexidine rinse.

Outcomes of the Surgical Procedure

Immediately following surgery, the patient responded well to the procedure with minimal discomfort and no infection. At two weeks (Figure 15), the periodontal dressing and sutures were removed, revealing a creamy white, filmy appearance of the allograft membrane and a surrounding erythema. Delayed healing was noted and the patient reported mild tenderness in the area.

The patient continued to use chlorhexidine rinse for two additional weeks. At four weeks (Figure 16), the graft had more of a granular and erythematous appearance, indicating increased vascularity to the site, although the creamy white



Figure 12. Surgical excision of the gingival mass.



Figure 14. Placement of the acellular dermal graft.



Figure 13. Osteoplasty of the alveolar bone.



Figure 15. Creamy white, filmy appearance of the graft site, 2 weeks postoperatively.



Figure 16. Variegated red and white, granular appearance of the graft site, 4 weeks postoperatively.



Figure 17. Labial view, complete healing of the surgical site with good esthetics at 3 months.

membrane persisted. Three months after the surgical procedure (Figure 17), the grafted area showed satisfactory results, excellent contour, color, texture, and imperceptible blending with the

adjacent tissues. The patient has been followed for 1.5 years without evidence of lesion recurrence or rejection of the graft.

Peripheral Osteosarcoma

Choice D. Sorry, this is not the correct diagnosis.

The peripheral osteosarcoma is a rare malignancy of bone that originates in the cortex and expands outward. Typically a tumor of long bones, it may develop in the jaws with the mean age being 35-years old at the time of diagnosis.³ Clinically, it presents as a nontender, sessile to pedunculated hard enlargement of the attached gingiva or alveolar mucosa.⁴ It occurs most frequently in the mandible with a strong male

predilection. The duration of most of these tumors is 1 to 5 years, but some lesions may be present for several decades. Localized, irregular opacities with or without periosteal expansion are the radiographic features. Microscopically, trabeculae of immature or woven bone are found in a fibrous stroma that contains varying numbers of tumor cells. Foci of osteoid and chondroid metaplasia may be observed. In contrast to the intramedullary osteosarcoma, the prognosis of the peripheral variant is significantly better when treated with radical surgical excision.

Please re-evaluate the information about this case.

Cutright Lesion

Choice E. Sorry, this is not the correct diagnosis.

The Cutright lesion is also referred to as reactive osseous and chondromatous metaplasia.⁵ It is usually diagnosed in long-term denture wearers, who exhibit marked atrophy of the edentulous alveolar ridges. These painful lesions may be associated with flabby alveolar mucosa or a localized enlargement.⁶ Although they may

develop at any edentulous site, the crestal ridge of the posterior mandible is the predominant location. Radiographic findings support the presence of a thin, atrophic alveolus. Fine linear projections or irregular calcifications may be seen within the soft tissue swelling. Microscopically, these lesions may have an ominous appearance that is composed of hypercellular periosteum that blends into osseous and chondromatous tissue.

Please re-evaluate the information about this case.

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Note: Bio information was provided at the time the case challenge was developed.

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