

# TODAY'S FDA

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# Diagnostic Discussion

Don Cohen, DMD

*Diagnostic Discussion is contributed by University of Florida College of Dentistry (UFCD) professors Drs. Don Cohen and Indraneel Bhattacharyya and provides insight and feedback on common, important, new and challenging oral diseases.*

*The dental professors operate a large, multi-state biopsy service. The column's case studies originate from the more than 8,000 specimens the service receives every year from all over the United States. Clinicians are invited to submit cases from their own practices. Cases may be used in the Diagnostic Discussion, with credit given to the submitter.*

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**Fig. 1** - Clinical photo demonstrates an ulcerated mass located interproximally between the maxillary left premolar teeth on the facial aspect.



**Fig.2** - Periapical X-ray of the premolar area shows only minimal bone loss and no obvious bony destructive lesion.

## Patient History:

A 55-year-old Caucasian female was referred to Dr. **Daniel S. Lauer** of Palm Beach Gardens by Dr. **Jimmy Chen** of Vero Beach for a chronic red/white lesion interproximal to teeth #12 and #13 (Figure 1). The patient has an unremarkable medical history except for a diagnosis of post-menopausal osteopenia for which she takes a prescription form of vitamin D. She also takes multiple other vitamins and is a lifelong nonsmoker.

Clinical examination by Dr. Lauer revealed that the lesion was primarily on the facial aspect and had a peduncle or stalk. The patient reports traumatizing the area with a hand-held flossing device and, in an attempt to "keep the area from getting infected," continued to floss and clean the area with various devices, producing increased inflammation and irritation. The lesion had been present for approximately eight weeks prior to biopsy. The patient has a history of root coverage procedures (more than seven years prior) for localized areas of Miller class 1-3 muco-gingival recessions in this area. The involved teeth are mildly palpation and percussion sensitive along with the class 1 mobility. The lesion also caused some bleeding. Radiographic evaluation of the area showed no significant osseous changes (Figure 2).

Dr. Lauer's initial assessment was possible fibroma. To obtain a definitive diagnosis, he did an excisional biopsy of the mass and submitted the tissue



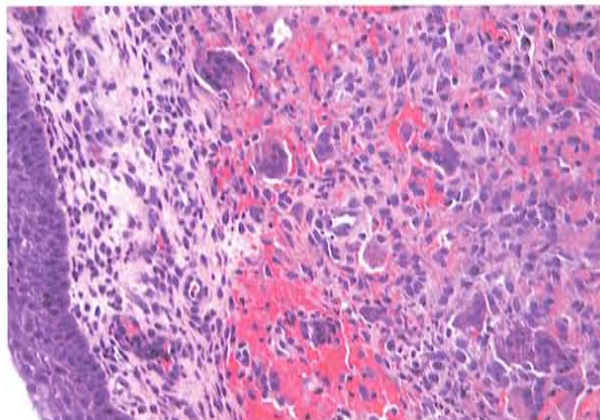
sample for histologic examination to the UFCD Oral and Maxillofacial Pathology Laboratory in Gainesville. Examination revealed sections of a smooth-surfaced mass composed of superficial stratified squamous epithelium and underlying fibrous connective tissue. The underlying fibrous stroma is highly vascularized and composed of loosely and densely arranged collagen fibers interspersed with fibroblasts. Many large multinucleated cells are seen throughout the fibrous stroma. Numerous hemorrhagic foci and abundant hemosiderin pigment are also present (Figure 3).

### Question:

Based on the clinical and histologic findings and medical and dental histories, what is the most likely diagnosis?

- A) pyogenic granuloma
- B) focal fibrous hyperplasia/fibroma
- C) peripheral ossifying fibroma
- D) peripheral giant cell granuloma
- E) foreign body granuloma

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**Fig.3** - Examination reveals normal surface stratified squamous epithelium (at the left margin), overlying an inflamed fibrous loose connective tissue containing numerous plasma cells, lymphocytes and collections of multinucleated cells admixed with extravasated red blood cells (10x original magnification).



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### A. Pyogenic Granuloma

**Incorrect** – Pyogenic granuloma (PG) is a great choice as this entity is one of the three lesions that most often presents as “bumps on the gum.” Pyogenic granulomas are considered to be an exuberant healing response most often caused by chronic irritation or trauma. They are therefore not considered to be true neoplasms. The name pyogenic granuloma is incorrect because these lesions are not full of pus (pyogenic), nor true granulomas. They are actually composed of well-vascularized fibrous connective tissue and eventually mature into a dense fibrous connective tissue mass or fibroma.

Seventy-five percent of pyogenic granulomas occur on the gingiva; most are subsequent to chronic irritation from calculus or trauma. They usually appear as red or pink exophytic growths that vary in size from a few millimeters to several centimeters (just as in this case). As pyogenic granulomas age, they tend to become more fibrous and less vascular and can appear mucosal colored. These lesions are much more common in females. It is also important to note that our patient's lesion is relatively painless and this is a salient clinical feature of pyogenic granulomas. Also, 95 percent of pyogenic granulomas are ulcerated and covered by a whitish yellow fibrinopurulent exudate, as seen in this patient.

However, while PG can occur at any age, they are most common in children and young adults. Most importantly, the

histology of our patient's lesion revealed numerous multinucleated giant cells, a feature not seen in PG. (If you ignore the histologic findings, PG would have been the best answer.)

### B. Focal Fibrous Hyperplasia/Fibroma

**Incorrect** – Focal fibrous hyperplasia/fibroma is a very good guess. Masses on the gingiva frequently represent post-traumatic fibrous hyperplasias. Also, most of the bumps on the gum (pyogenic granuloma, peripheral giant cell granulomas and peripheral ossifying fibromas) will over time become more fibrotic and strongly resemble or actually turn completely into fibromas/fibrous hyperplasia. Pain is also not a major feature seen in fibromas, nor was it present in this case. Also, fibromas are usually mucosal-colored, just as in the present patient. Finally, the histology would be a match, except for the finding of numerous multinucleated giant cells in this patient's biopsy sample.

### C. Peripheral Ossifying Fibroma

**Incorrect** – Peripheral ossifying fibromas (POF) are common hyperplastic growths occurring on the gingiva only. Like the other bumps on the gum, they are frequently caused by chronic irritation (calculus, ill-fitting crown, etc.) and/or trauma. They strongly resemble each other clinically and microscopically. All these lesions occur much more frequently in women and appear as red/pink sessile or pedunculated growths of the gingiva. Microscopically, all are composed of inflamed fibrous connective tissue and/or granulation tissue. However,

POF must also contain foci of calcified material such as cementum, osteoid or bone, which this lesion did not.

While all these may represent variations of the same lesion, there are a few differences. This lesion is most common in children and young adults with the peak incidence falling between 10 and 19 years – our patient is 55 years old. While all these lesions can occur in older adults, finding these in older adults is less common than in pyogenic granulomas or peripheral giant cell granulomas. Therefore, the main differentiating factor is the presence of dystrophic calcification or actual bone or osteoid in POF.

### D. Peripheral Giant Cell Granuloma

**Correct** – Peripheral giant cell granulomas (PGCG) are not true neoplasms, but represent an unusual hyperplastic connective tissue response to chronic injury to the gingiva. The gingiva reacts to these insults with a localized overgrowth of tissue in one of four forms: focal fibrous hyperplasia, pyogenic granuloma, peripheral ossifying fibroma or peripheral giant cell granuloma. PGCGs are the rarest of the four patterns and are most often found in adult patients with a peak incidence in the fifth or sixth decade, a perfect age match for this patient.

While uncommon, PGCG represents the fourth entity characterized as a “bump on the gum.” PGCGs are almost invariably asymptomatic and always are found on the gingiva or alveolar ridge, usually anterior to the molar teeth in areas previously occupied by decidu-



ous teeth. Furthermore, when found in edentulous areas, they often involve the underlying bone and cause cup-shaped radiolucencies. As with the other bumps on the gum, PGCGs are usually caused by local irritation (calculus, etc.) or chronic trauma and represent an exuberant response to minimal irritation. These lesions also have been rarely found in association with dental implants.

As with all the other bumps on the gum, PGCGs are more common in females and most often present as sessile interproximal lesions. As in this case, PGCGs are usually less than 2 cm in diameter but, most importantly, they usually have a distinctive blue color that often allows us to differentiate it from the other bumps on the gum. Without the blue color, the only way to distinguish PGCGs from the other bumpy entities is to use the histologic features. Dense fibrous connective tissue and granulation tissue are common to all these reactive gingival lesions and PGCG can even contain bone and osteoid. However, PGCGs must also have numerous giant cells to be called giant cell granulomas. These giant cells were once thought to be osteoclasts but it is still not certain what their exact origin is.

Even though all bumps on the gum have many overlapping histologic features, finding these characteristic giant cells in a tissue biopsy is the pathognomonic feature for this diagnosis. It is important to biopsy these lesions and submit the tissue for histologic examination as malignancies, metastatic and primary, and peripheral odontogenic tumors, can masquerade as bumps on the gum as well.

The treatment of these lesions can be problematic. Simple excision is curative but, since they arise from the periodontal ligament or periosteum, unless the clinician goes deep enough, they can recur. Incomplete excision is a common problem and most of the biopsy specimens we see of all three bumps on the gum show the reactive process extending to the base of the specimen. We are therefore fortunate to only have about a one in 10 recurrence rate for these lesions. It probably would be higher, but most clinicians also remove the causative irritant (such as calculus) in the area, which may prevent recurrence. When these do recur, excision must be carried down to the periosteum and the resultant cosmetic defect may necessitate a flap procedure or sub-epithelial connective tissue graft to correct or prevent the tissue defect.

### E. Foreign Body Granuloma

**Incorrect** – Most examples of foreign body granulomas (FBG) are found in the gingiva or periapical areas. In the periapical area they are usually caused by root canal filling material extending beyond the root apex. In the gingival, the foreign material can be amalgam, graphite or, most commonly, a material used in dental prophylaxis. These lesions are termed granulomatous gingivitis and most often appear as painful erythematous areas on the gingiva that are resistant to treatment.

Other commonly noted instances of exuberant foreign body reactions are seen with accidental implantation of foreign material into oral tissues. FBG is a good choice in this case because there is a past history of the patient experiencing

root covering procedures with grafting materials in this area in the past. With an FBG, the microscopic features would include numerous multinucleated foreign body type giant cells as seen in this patient's biopsy. However, most importantly, her giant cells did not contain any foreign material. Another problem with the FBG diagnosis – these grafts were done more than seven years ago and one would expect a foreign body reaction to develop sooner.

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