

Pyogenic Granuloma Removal Combined with Coronal Flap Advancement

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Abstract

Introduction: Pyogenic Granuloma (PG) is a vascular lesion with unclear etiology. Usually affects mucosa but can also be found on skin. PG is also known as pregnancy tumor, lobular capillary hemangioma, granuloma gravidarum, granulation tissue-type hemangioma and/or eruptive hemangioma.

Objective: A 15-year old female patient presented with a swelling and growth on the anterior buccal portion of the maxilla for the last 6 months. After clinical and histological examination, a diagnosis of pyogenic granuloma was confirmed. Excisional biopsy followed based on the location of the lesion would have result in gingival recession and compromised gingival esthetics.

Sources: PGA is usually asymptomatic and its development is generally slow. Local chronic trauma is considered to be the main probable cause, but poor oral hygiene, as well as hormonal disturbances, could be other related factors. Treatment consists of conservative surgical excision. Coronal flap advancement after surgical excision may prevent gingival recession.

Keywords: *Pyogenic Granuloma; Coronal Flap Advancement; Mucogingival Defect; Gingival Esthetics*

Background

Pyogenic granuloma (PG) is a vascular lesion that occurs usually in mucosa, but can also be found in other tissues (skin, nasal septum). Its pathogenesis and etiology are not very clear. However, local chronic trauma delivered to the tissue is considered to be the main probable cause. The rupture of the epithelial barrier by the local trauma causes an invasion of microorganisms, which could enhance the amount of damage to the affected tissue. Poor oral hygiene, as well as hormonal disturbances, could be other precipitating factors. The term Pyogenic Granuloma was introduced by Hartzell in 1904, but the lesion was first described by Hullihen in 1844 [1]. PG is also known as pregnancy tumor, lobular capillary hemangioma, granuloma gravidarum, granulation tissue-type hemangioma and/or eruptive hemangioma. Despite the name, the lesion neither causes pus formation nor histologically represents a true granuloma. From a histological point of view, the term "lobular capillary hemangioma" is considered to be more appropriate [2-4].

In the oral cavity, PG is most commonly found in the gingiva (75%), but it can also appear in other locations, such as the buccal mucosa, palate, tongue and lips [5,6]. A sessile or pedunculated exophytic mass seems to be the most common appearance. Easy bleeding is associated. Ulcerations are not unusual and when present, they are covered by a yellow fibrinous membrane. The degree of vascularization determines the color of the lesion, which could be red (most usual), purple or pink [7,8].

Clinical Presentation

A 15-year-old female presented to the Center for Advanced Periodontology and Implant Dentistry at the University of Florida College of Dentistry with a chief complaint of a swelling and growth on the anterior buccal portion of the maxilla. The lesion had been present for 6 months. The patient was not in pain, but she reported some discomfort and often bleeding while eating.

Intra-oral examination revealed a well-defined large sessile lesion extending from the mesial of the right canine to the mesial of the left central incisor. The lesion measured 12 mm in length, it had a height of 9 mm on its distal portion (next to the canine) and 11 mm on its mesial portion (next to the central incisor). The lesion was reddish and it had a pedunculated area at its distal part, which exhibited easy bleeding under manipulation. Periodontal examination showed some mild plaque accumulation with signs of inflammation. Neither signs of bone loss nor signs of calcification within the lesion were noted on a periapical x-ray.

Extra-oral examination did not reveal any significant findings. According to the medical history, the patient was systemically healthy.

Approximately two years earlier, the patient presented with the same tissue growth, which was surgically excised in the same department and the specimen was subjected to histopathological analysis. The result revealed that the lesion was a PG.

Case management

Patient's mother was asked to give a written informed consent for the surgical excision of the lesion. Following infiltration of local anesthesia (Articaine 4% with 1:100,000 epinephrine), intrasulcular incisions were performed from the mesial of the right first pre-molar to the mesial of left first pre-molar. A reverse beveled gingivectomy was performed on teeth #9, 10 and 11 in order to correct the esthetic mucogingival defect that would be created with the removal of the lesion and adjacent keratinized tissue from teeth #6, 7, 8. A vertical incision was placed at the distal aspect of #5 to provide enough mobility to the flap.

After the lesion was completely excised, a full-thickness flap was reflected and a periosteal releasing incision was made to achieve ideal mobility of the flap. The flap was then coronally advanced on the right side to cover the denuded roots and avoid future gingival recessions. The flap was stabilized in the correct position with single interrupted sutures (4-0 PTFE suturing material).

The patient was discharged with appropriate post-operative instructions (including oral hygiene) and with a prescription for ibuprofen 800 mg (1 pill/every 8 hours for 2 days) and chlorhexidine mouthwash (0.12%). A follow-up appointment was scheduled for 2 weeks later.

Clinical outcomes

At the 2-week follow-up visit the tissues were still inflamed. Edema and erythema of the papillae were noted. Immediate recurrence of the lesion was suspected. Sutures were removed, OHI given and a new follow-up appointment was arranged.

With 1 month of healing, the tissues were more mature, but edema and erythema of the papillae were still present. A new appointment was scheduled a month later for a possible excision of the remaining lesion. After 1 month (2 months of healing) the tissues seemed to be completely healed and no additional surgical procedure was required.

The patient is currently on frequent recalls (every 2 months) to monitor any recurrence of the lesion.

Histology

Two biopsies were removed for histopathological analysis. One specimen consisted of a red nodular-shaped piece of soft tissue measuring 0.6 x 0.5 x 0.3 cm, and the second specimen was a white nodular-shaped piece of soft tissue measuring 1.5 x 0.5 x 0.5 cm.

Microscopic examination of the red sample revealed multiple sections composed of inflamed fibrous tissue with a parakeratinized stratified squamous epithelium on the surface. The epithelium was covered by a thin layer of parakeratin and showed significant thickening of the spinous cell layer with elongated, fused and arborizing rete ridge formation. The epithelium was transmigrated by numerous lymphocytes.

The underlying connective tissue was composed of smudged hyalinized collagen bundles interspersed by congested vascular channels and proliferating endothelial cells and fibroblasts. The connective tissue exhibited a dense patchy inflammatory infiltrate composed mainly of lymphocytes, plasma cells and neutrophils.

The white sample revealed multiple sections composed of dense fibrous and myxomatous connective tissue with parakeratinized stratified squamous epithelium on the surface. The epithelium was covered by a thin layer of parakeratin. The epithelium was well oriented though it did form some elongated rete ridges.

The underlying connective tissue formed the bulk of the specimen, and was composed of smudged hyalinized collagen bundles admixed with areas rich in elements. Only scattered lymphocytes and plasma cells were seen.

The final diagnosis was given as Pyogenic Granuloma ICD-10: K13.



Figure 1: Clinical presentation of the patient showing a pyogenic granuloma involving the anterior aspect of the maxilla.



Figure 2: Excisional biopsy of the lesion and complete lesion removed and sent to microscopic examination.



Figure 3: Immediate post-excision coronally advanced flap sutured with PTFE sutures.



Figure 4: 2-week follow-up.



Figure 5: 2-month follow-up.



Figure 6: 6-month follow-up

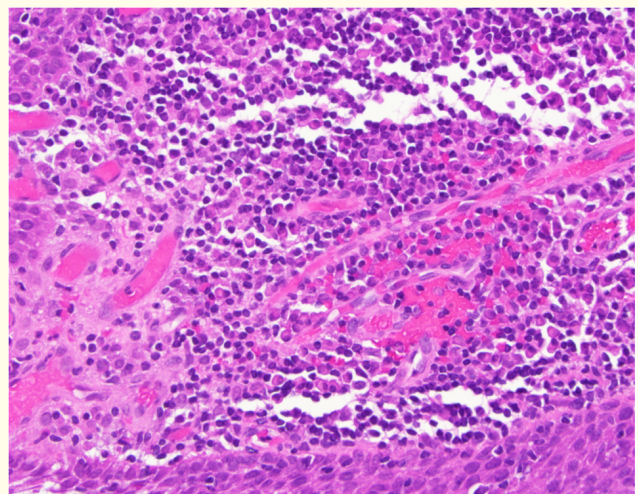
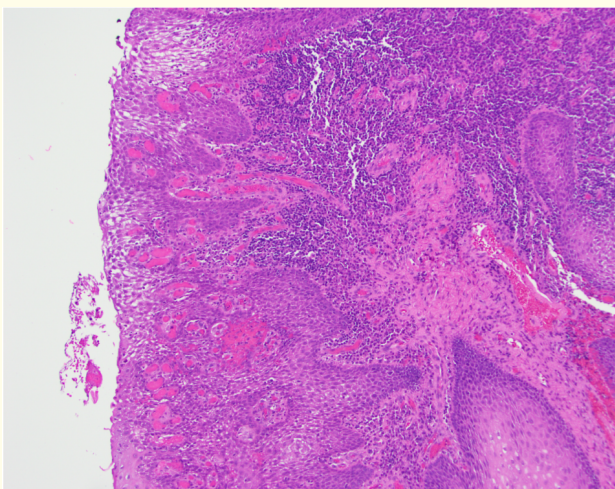
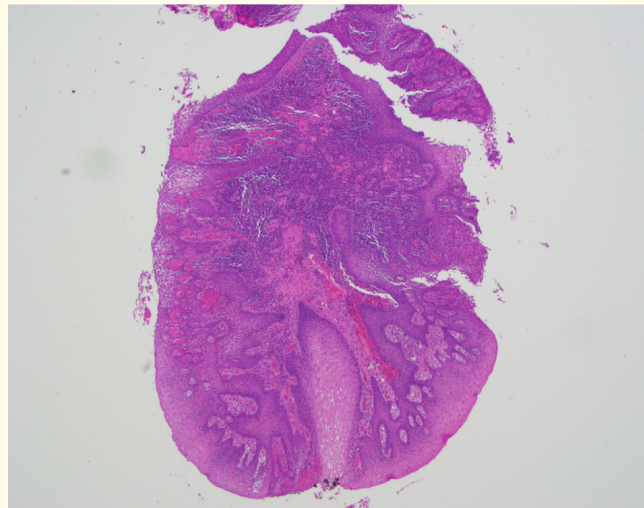


Figure 7a-7c: **a:** Microscopic images. Fibrous tissue surfaced by parakeratinized stratified squamous epithelium. Epithelium shows significant thickening of the spinous cell layer with elongated, fused and arborizing rete ridge formation; **b, c:** Higher magnification. Underlying connective tissue is composed of smuggled hyalinized collagen bundles interspersed by congested vascular channels and proliferating endothelial cells and fibroblasts.

Discussion and Conclusion

The lesion is usually asymptomatic and its development is generally slow. However, in some patients, PG can reach its full size quickly and then remain stable for a long period of time. There is a big variation on the size of the lesions, ranging from a few millimeters to several centimeters (rarely exceeds 2 cm). PG can also be found in any period of life, but the second decade of life seems to be preferred. In fact, a higher number of cases have been described in young adult females, probably because of the vascularization effects of progesterone and estrogen [9].

Final diagnosis of PG can be only obtained by histological investigation. Some differential diagnosis may include: metastatic cancers, non-Hodgkin's lymphoma, angiosarcoma, bacillary angiomatosis, Kaposi's sarcoma, hyperplastic gingival inflammation, peripheral ossifying fibroma and peripheral giant cell granuloma.

Treatment of PG usually consists of conservative surgical excision. Since the lesion is not encapsulated, the identification of its limits can be challenging for the surgeon and that may be the cause of some occasional recurrence. Other kinds or treatments are also available nowadays, such as chemical cauterization, sclerotherapy (sodium tetra decyl sulphate), laser surgery and cryosurgery [10,11].

In the present report, we describe the surgical removal and the histopathological analysis of a recurrent PG on a young female patient. The presence of a pathological lesion as a pyogenic granuloma may be a challenge from the periodontal point of view, especially when the lesion is located at or in intimate contact with the gingival margin.

When excisional biopsies are performed at the gingival margin, a higher incidence of complications should be expected. The most common complication seen is recession. Gingival recession is defined as apical migration of the gingival margin from the crown of the teeth, and is accompanied with attachment loss, sensitivity and anesthetic results. Hence, flap manipulation using traditional periodontal root coverage procedures, with or without soft tissue grafting, are indicated in order to either prevent or minimize gingival recession following excisional removal of PG.

Pathological lesions that are located close to the gingival margin and at least 2 mm short to the mucogingival junction can be excised in conjunction to a rotational flap. This approach will lead the treatment to better outcomes and more esthetically acceptable results. Simple coronal flap advancement after periosteal flap release may also be indicated if residual KG is found on the flap following excision of the lesion. These procedures in combination with soft tissue grafting (i.e. subepithelial palatal connective tissue, acellular dermal matrix, etc.) would be indicated if lesion removal extends to or beyond the MGJ.

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