Case Report

Extragingival pyogenic granuloma of the lower lip masquerading as a vascular lesion

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Abstract

Pyogenic granuloma (PG) is a benign nonneoplastic mucocutaneous lesion. It occurs as a result of chronic irritation or due to hormonal changes. The most favorable site for this fairly common lesion is gingiva, but rarely, it can occur outside the oral cavity, later often difficult to diagnose, as a diverse group of the pathologic process can produce such lesions outside the oral cavity. The diagnosis is also challenging as the lesions appear as smooth or lobulated red nodules with easy bleeding, occasionally ulcerated mimicking malignancies. The purpose of this article is to report a rare case of extragingival PG of the lower lip simulating as a vascular lesion in young male of 30 years old diagnosed by ultrasound followed by histopathological examination.

Keywords: Hypoechoic lesions, lobular capillary hemangioma, pyogenic granuloma, ultrasound, vascular lesions

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INTRODUCTION

Pyogenic granuloma (PG) is a common, soft-tissue tumor of the oral cavity that is supposed to be reactive in nature rather than neoplastic. The term "PG" is itself a misnomer as this condition is not associated with pus and does not represent a granuloma histologically.[1]

The term PG was given by Hartzell in 1904. The overall incidence of Pyogenic granuloma (PG) is between 26.8% and 32% of all the reactive lesions.[2] It develops in about 5% of the pregnancies, hence also called pregnancy tumor or granuloma gravidarum.[3]

PG occurs most commonly in the gingiva. Other sites include extragingival areas such as lips, tongue and buccal mucosa. The peak prevalence is in teenagers and young adults, with a male-to-female ratio of 2:16. Clinically, these lesions usually present as a sessile or pedunculated solitary nodule with smooth or lobulated surface and are red, elevated and usually ulcerated.[2]

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The purpose of this article is to present an unusual case of PG of the lower lip in young male, where many lesions of the oral mucosa with similar clinical characteristics were considered in differential diagnosis, before arriving at a final diagnosis through ultrasound and biopsy. PG can be diagnosed clinically, but rarely, this entity can have atypical presentations and uncommon location. It is vital to emphasize the role of correct diagnosis of these lesions and distinguishing them from some aggressive lesions where PG mimic vascular lesions. Color Doppler ultrasound is the modality of choice to study blood flow within the lesion to rule out any vascular lesion before treatment.

CASE REPORT

A 30-year-old male patient reported with a chief complaint of a growth on his lower lip which was esthetically unpleasant and causing hindrance in speech and mastication for 3 months. The growth was initially of negligible size, which had gradually increased and had attained the present size. The mass was not painful, but bled often while eating and rinsing. The patient gives a history of habit of lip biting.

Examination of the head and neck revealed no cervical and submandibular lymph node enlargement. The patient's medical history was unremarkable.

On inspection, a dome-shaped exophytic growth of size approximately 1 cm × 0.8 cm in diameter seen on the mucosal surface of the lower lip on the left side, [Figure 1] the surface was lobulated and intensely erythematous with few blood vessels visible on superficial surface on inner side while the outer surface was covered by a yellowish pseudomembrane with areas of crustation and few bleeding points. The growth was firm in consistency, pulsatile and nontender with minimum bleeding on palpation. The lesion did not blanch on pressure. Hence, based on clinical examination, differential diagnosis of traumatic hematoma, fibroma, vascular tumor and benign salivary gland tumor, keratoacanthoma and PG was given.

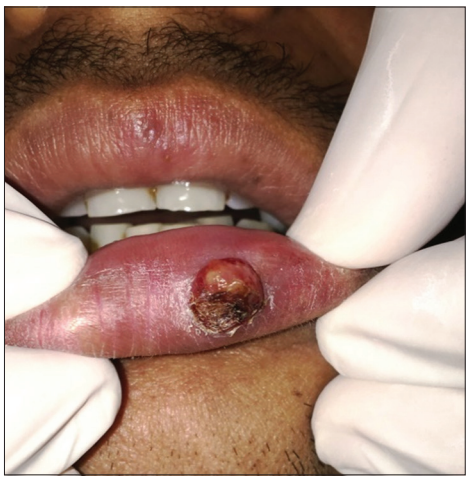

Figure 1: Clinical image shows a lesion on the lower lip

To rule out any aggressive vascular lesion, the patient had underwent ultrasound examination of the lesion with high-frequency ultrasound probe that revealed an irregular isoechoic region of size 0.9 cm × 0.6 cm surrounded by hypoechoic area on the lower lip on the left side [Figure 2]. Ultrasonography was performed with a Voluson 730 scanner (GE Healthcare) using 12 MHz linear transducer. These probes were thinly coated with sterile gel, covered with a rubber sheath and placed directly on the surface of the lip. The sonographic examinations were performed using both the B-mode and Doppler mode in two perpendicular directions if possible.

On Color Doppler examination, the lesion showed multiple scattered internal vascular channels both in the central and peripheral regions of the lesion [Figure 3].

On ultrasound examination, fibromas, salivary gland tumors, hemangiomas and lymphangioma are round/ovoid/lobulated with well-defined borders, while, PGs are irregular and have ill-defined borders. On Color Doppler examination fibromas, adenomas shows poor signals, hemangiomas shows hypervascularity with anechoic spots, whereas, PGs show scattered central and peripheral vascular signals.

An excisional biopsy was performed [Figure 4] under antibiotic cover and sutures were given. The histopathological examination revealed stratified squamous epithelium with areas of ulceration. A fibrinopurulent membrane consisting of neutrophils and extravasated red blood cells (RBCs) was noted in the ulcerated areas. Numerous endothelium-lined blood vessels engorged with RBCs and budding capillaries were noted in the

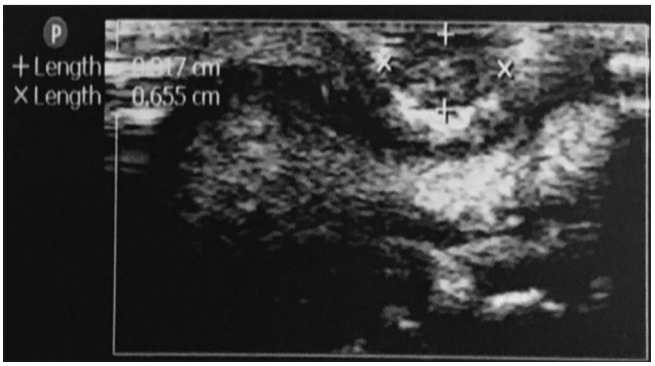

Figure 2: Image of the ultrasound showing irregular isoechoic region surrounded by the hypoechoic area

underlying connective tissue stroma [Figure 5]. Dense chronic inflammatory cell infiltration consisting chiefly of lymphocytes and plasma cells was also noted. Based on these histopathological findings, the diagnosis of PG was confirmed.

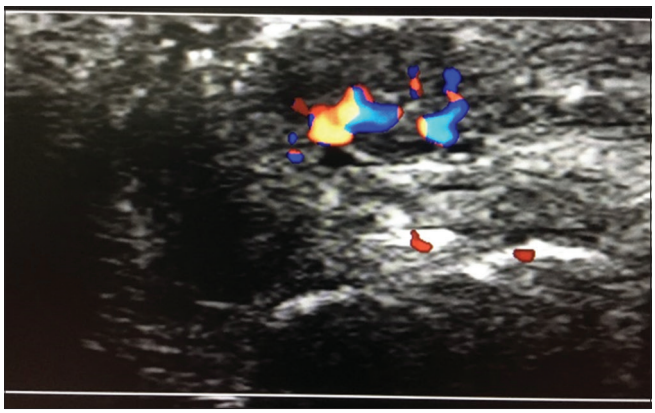

Figure 3: Image showing multiple scattered internal vascular channels both in the central and peripheral regions of the lesion

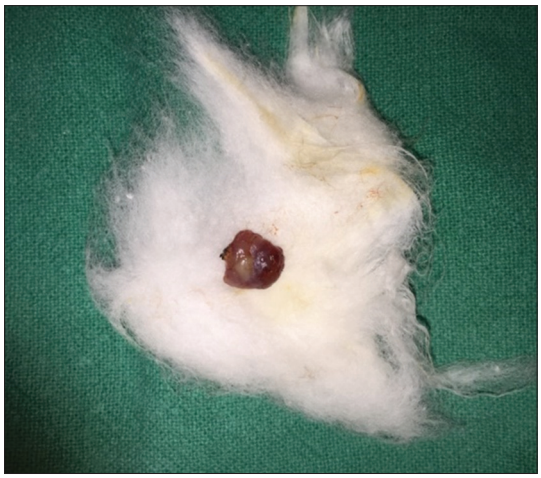

Figure 4: Clinical image showing excised tissue

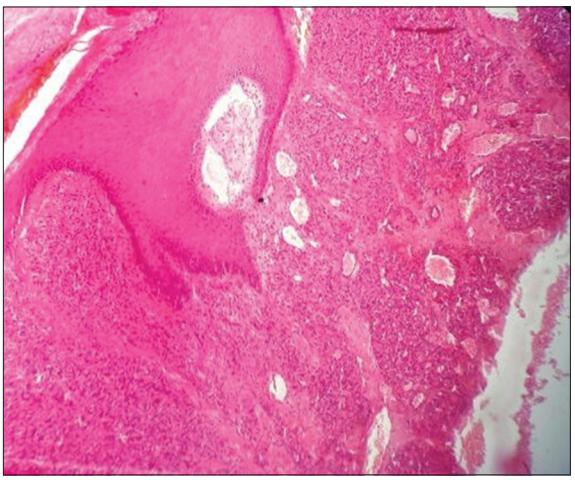

Figure 5: Histopathological image shows ulcerated stratified squamous keratinized epithelium with underlying granulation tissue. Numerous blood vessels arranged in lobular pattern is seen in the connective tissue. (H and E stain, ×100)

The patient was advised for regular follow-up and made to revisit us at 3 months and then at 6 months. The patient is doing well, and no recurrence of the lesion is noted.

DISCUSSION

PG is a relatively common lesion of the oral mucosa, first described by Poncet and Dor as "human botryomycosis." Subsequently, it was proposed that pyogenic bacteria such as streptococci and staphylococci are the main reason. However, there is no evidence of any infectious organisms isolated from the lesions, and hence, the name is a misnomer.[4] It is now agreed that PG occurs as a result of various stimuli such as low-grade chronic irritation, trauma, hormonal imbalances or certain kinds of drugs which cause overzealous proliferation of a vascular type of connective tissue.[5]

According to Shafer *et al*., oral PG arises as a result of infection by either staphylococci or streptococci, partially because it was shown that these microorganisms could produce colonies with fungus-like characteristics. They also suggested that PG arises as a result of some minor trauma to the tissues that provide a pathway for invasion of nonspecific types of microorganisms.[6] This could be the reason for PG at unusual locations such as lower lip, as in our case where the patient gives history of chronic lip biting.

Regezi *et al*. suggest that PG shows an exuberant connective tissue reaction and proliferation to a known stimulus or injury such as calculus or foreign material within the gingival crevice. Several "etiologic factors" chronic irritation, hormones, drugs, gingival inflammation, preexisting vascular lesions, defective fillings, food impaction, toothbrush trauma, etc., have been suggested as etiological factors where patients presented with these findings.[7]

PGs have increased predilection to occur in the keratinized mucosa, often in the gingiva of the anterior segment of the maxillary jaw. It can occur in other sites of the head and neck in areas of trauma including the buccal mucosa, the alveolar mucosa of edentulous ridge, palate and lower lip. This lesion has no age predilection and tends to occur more common in females than in males. The female sex predominance can be due to the hormonal changes during puberty and pregnancy, which can modify the reparative

gingival response to injury, producing so-called pregnancy tumor.[8]

Clinically, the lesion typically appears as sessile/pedunculated, smooth/nodular exophytic growth of red or pink depending on the duration and vascularity of the lesion. The surface of the lesion can show areas of intense erythema, areas covered with pus and some ulceration, crustation as was seen in the present case, which suggests impingement of the lesion during speaking and mastication.[2]

The oral cavity includes various tissues, such as muscles, nerves and vessels, minor salivary glands and fatty tissues. To diagnose lesions, we need to determine the origin of the tissue. In addition, it is necessary to evaluate whether the lesion represents inflammation, tumor, cyst, hyperplasia, vascular lesions or other types. When we consider these points, computed tomography (CT), magnetic resonance imaging (MRI) and intraoral ultrasound (IOUS) are very adequate for preoperative imaging of these suspicious lesions.

While CT, MRI clearly shows extent of the lesion IOUS and Color Doppler is the method to study the internal structure and vascularity of the various lesions[9] [Tables 1 and 2].

Although PG can be diagnosed clinically and histopathology is the gold standard for diagnosis, atypical presentations can sometimes leads to inappropriate diagnosis; hence, it should be further investigated. Regarding the low occurrence of PG in extragingival sites, it is vital to emphasize the role of correct diagnosis of these lesions and distinguishing them from other lesions with similar characteristics. In our case, to rule out any vascular lesion, Color Doppler ultrasound of the lesion was advised to study blood flow within the lesion.[10]

At ultrasound usually, PG appears as ill defined, irregular subcutaneous isoechoic

hypoechoic area, whereas Color Doppler sonography shows marked internal vascularity in both the central and peripheral tumor regions due to the presence of feeder vessels similar to our case.[10]

The differential diagnosis of intraoral PGs include hemangioma, lymphangioma, peripheral giant cell granuloma, fibroma, peripheral-ossifying fibroma, conventional granulation tissue, minor salivary gland tumor, Kaposi's sarcoma and angiosarcoma.[11]

For PG, surgical excision is the treatment of choice. After surgical excision, curettage of underlying tissue is recommended. Other conservative techniques are cryosurgery, electrodessication and sclerotherapy, Nd: YAG laser.[12]

CONCLUSION

Although PG can be diagnosed clinically atypical presentations can sometime leads to inappropriate diagnosis; hence, it should be further investigated. Regarding the low occurrence of PG in extragingival sites, it is vital to emphasize the role of correct diagnosis of these lesions, and distinguishing them from other lesions with similar characteristics, so that one can formulate a proper treatment plan.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient (s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initial s will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

Table 1: Ultrasonic findings of various lesions

Lesion	Shape	Border	Internal echogenicity
Inflammation	Irregular	Ill defined	Hypo/hyperechoic
Hyperplasia	Irregular	Well defined	Hypoechoic
Haemangioma	Lobulated	Well defined	Hypoechoic
Lymphangioma	Septated cystic	Well defined	Anechoic-hypoechoic
Adenoma	Ovoid lobulated	Well defined	Hypoechoic
Neurofibroma	Round ovoid	Well defined	Hypoechoic

Table 2: Color Doppler signal and echo pattern on ultrasound for various lesions

Lesion	Internal echo/posterior echo	Compressibility/fluidity	Color Doppler signal
Inflammation	Echogenic spots/no enhancement	−/−	Scattered internal or peripheral
Hyperplasia	None/enhancement	−/−	Various
Hemangioma	Echogenic septum and anechoic area Acoustic shadow in phlebolith/enhancement	+/+	Hypervascularity (in anechoic spot)
Lymphangioma	Echogenic septum multicystic/enhancement	+/−	None (poor signal)
Adenoma	Depends on contents cystic area, acoustic shadow in hyaline degeneration/enhancement	−/−	Poor signal

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Conflicts of interest
There are no conflicts of interest.

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