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Case Series

Oral pregnancy tumor and its exigent medicament for expecting mothers using combination treatment modality: A clinical case series

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ABSTRACT

Aim: To emphasize the incidence of pyogenic granuloma in expecting mothers and a combined treatment of conventional method and diode laser.

Background: A pregnancy tumor is a pyogenic granuloma occurring on the gingiva during the gestation period. However, the term pyogenic granuloma is deceptive, because the lesion is distinct from infection.

Case Description: In this case series, 2 clinical reports are discussed in detail, unfolding the clinical appearance of the particular lesion. The histopathological correlation has been established and an apposite treatment modality is described, focusing on the minute considerations.

Conclusion: We observed a challenging incidence of overgrowth that was disturbing for the subjects, affecting their health along with the fetus'. There was no adverse effect while treating them during the 2^{nd} trimester of gestation. We were also efficient in achieving instantaneous coagulation with lasers preceded by comprehensive removal of the lesion using blades, making it a suitable and safe tool.

Clinical Significance: The dilemma of the clinician was resolved confirming that surgical excision is the gold standard for the complete removal of the lesion along with added benefits of lasers to reduce patient discomfort and accelerate healing.

1. Introduction

Pyogenic granuloma, also known as Crocker and Hartzell's disease, is an acquired non-neoplastic vascular mass of granulation tissue[1] that develops in skin and mucous membranes.[2] They might occur in response to stimuli such as hormonal factors, traumatic injury, or local irritants.[3] It was assumed to be an excessive granulomatous reaction to an infectious or pyogenic stimulus, turning out to be a misnomer.[3,4]

It is also referred to as granuloma gravidarum, granuloma of pregnancy, or epulis gravidarum when it appears in the intraoral mucosa, predominantly on the gingiva, commonly after the 3rd month of pregnancy, or earlier.[4] Hormonal variables appear to have a role in this lesion's pregnancy-related phenotype.[5] The incidence rate for such tumors is 0.2 to 9.6%.[6]

Therefore, as an attempt to correlate the literature, the succeeding paragraph voices 2 case reports of a massive lesion of the gingiva in a 27-year-old and 39-year-old pregnant female who reported to us within a year. Thus, experiencing the increased incidence of the ailment, we aimed to explain these cases in light of the precise diagnosis, appropriate precautionary measures, and emphasizing the need for the successful management of the lesion during their pregnancy.

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2. Case Description

2.1. Case Study 1

The particular patient is a 27-year-old female who reported to the Outpatient Department of Periodontology for clinical evaluation of a swelling associated with the upper front tooth region that hindered her masticatory and speaking functions. On the evaluation of her medical conditions, she was found to be in the second trimester of her pregnancy with no systemic diseases or history of allergies. The patient reported that the swelling first appeared 12 weeks back and was painless. It had gradually increased in size and vigorous bleeding was associated while brushing and eating. The patient's daily nutrition intake and mental status were seriously affected by this enlarging mass.

Her dental history and family history were irrelevant. On extraoral examination, there was no visible swelling or facial asymmetry. Intraoral scrutiny revealed a large solitary lobulated, pedunculated growth extending on the labial surface of central incisors and the palatal surface of 11, 21, and 22 in the maxillary arch (Figures 1 and 2). It appeared erythematous with greyish white patches along the borders and was approximately 11 mm × 9 mm × 5 mm in diameter. It was ovoid with a smooth surface, soft in consistency with no ulcerations, and bled on provocation with no pus discharge. Her oral hygiene was fair with no supragingival calculus and a minimal amount of plaque. There was no noted mobility with the associated teeth. A radiograph was taken with a radiation dose of 50 rad and it revealed no visible abnormalities. A routine hemogram was found to be normal. Based on the history and clinical examination, a diagnostic hypothesis of pyogenic granuloma and giant cell granuloma was considered. The differential diagnosis included peripheral ossifying fibroma, capillary hemangioma, and fibroma.

Fig. 1: Preoperative intraoral clinical picture (Labial view) showing pyogenic granuloma in between maxillary central incisors

As the patient was in the safe period of her pregnancy, the case was prepared for surgery based on the need for treatment before parturition. Under the foundation of detailed communication with the patient, her obstetricians, and her family, the treatment was planned for the excision

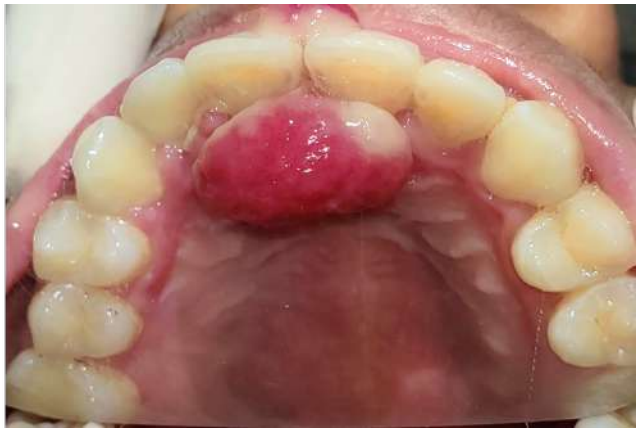

Fig. 2: Preoperative intraoral clinical picture (Palatal view) showing pyogenic granuloma

of the lesion under aseptic conditions. The patient was seated in the left lateral decubitus position with her right buttock and hip elevated by 15°. Excision of the lesion up to and including the mucoperiosteum was carried out under local anesthesia with the help of a scalpel and blade and coagulation was achieved using a diode laser (hemostasis mode, in continuous mode, power output 0.5 W, frequency 50 Hz), followed by removal of the residual lesion and local irritants with the help of curettage and thorough scaling (Gracey Curettes, Hu-Friedys®, Hu-Friedy Inc., Leimen, Germany) of the involved teeth (Figures 3 and 4). Postoperative instructions were given that included rinsing with 10 mL of chlorhexidine gluconate 0.2% mouthwash twice daily for 1 week. No anti-inflammatory agents or antibiotics were prescribed since neither pain nor infection was expected and the excised tissue (Figure 5) was sent for histopathological examination.Postoperative clinical picture (Labial view) after complete surgicalexcision (scalpel) and coagulation (diode laser)

Fig. 3: Postoperative clinical picture (Labial view) after complete surgical excision (scalpel) and coagulation (diode laser)

Histopathologically, hematoxylin-eosin (H&E) stained sections showed stratified squamous parakeratinized epithelium with pseudo-epitheliomatous hyperplasia (Figure 6) indicated by long slender rete-ridges extending

Fig. 4: Postoperative clinical picture (Palatal view) after complete surgical excision (scalpel) and coagulation (diode laser)

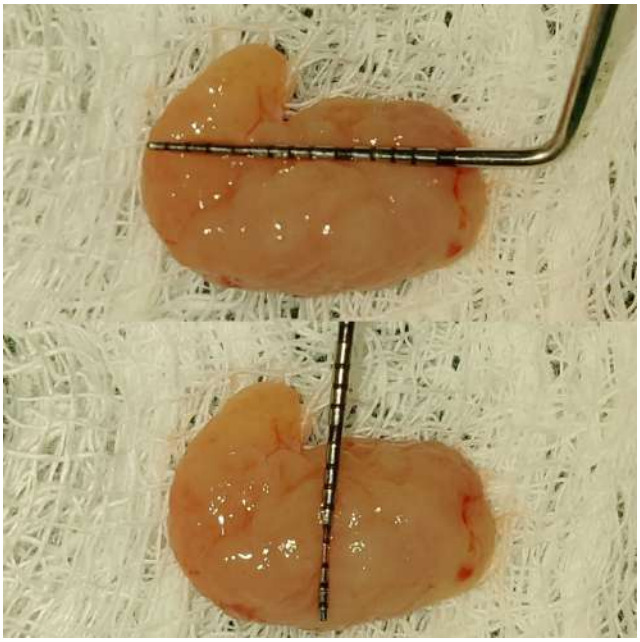

Fig. 5: Excised specimen

into the connective tissue stroma. The underlying connective tissue showed dense collagenization interspersed with fibroblasts. A vast number of endothelium-lined vascular spaces with budding endothelial cells were seen in the stroma along with dilated and engorged vessels arranged in a lobular pattern with extravasated red blood cells. Chronic inflammatory cell infiltration was seen chiefly comprising lymphocytes, macrophages, histiocytes, and plasma cells (Figure 7). Based on a clinicopathological correlation and its presentation during pregnancy, the diagnosis of pregnancy tumor was confirmed.

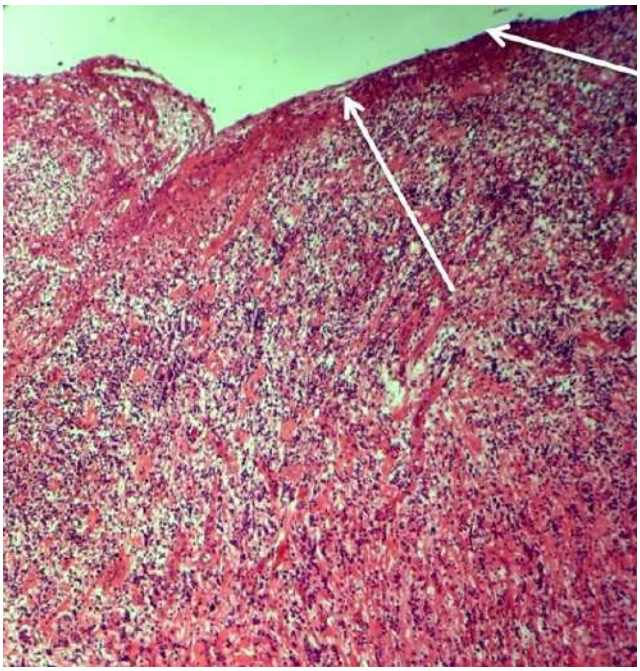

Fig. 6: Histopathological examination revealing parakeratinised stratified squamous epithelium, showing ulcerations

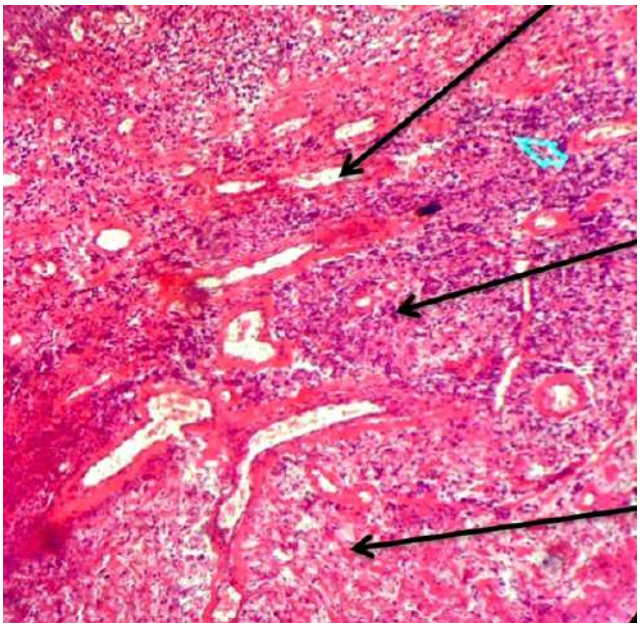

Fig. 7: Histopathological examination revealing numerous engorged blood vessels and capillaries with dense inflammatory cell infiltrate and loose fibrillar collagen

A post-operative care visit 7 days after surgery revealed satisfactory healing of the wound site (Figure 8) with a significant improvement of the masticatory functions with

complete resolution of her anxiety. The patient gave birth to a healthy baby at 40-weeks of gestation through natural labor. She was recalled every 3rd month post-partum for maintenance and re-evaluation and no recurrence of the clinical condition was noted for a follow-up for 1 year.

Fig. 8: 1-week follow-up (Labial and Palatal view)

Fig. 9: Preoperative intraoral photograph showing pyogenic granuloma at initial presentation

2.2. *Case study 2*

During the same year, a 39-year-old female patient visited us with the chief complaint of an enlarged mass of gums in her upper left back tooth region for 10 weeks. At the time of her visit, she was in the 15^{th} week of her gestation period with no other systemic history. On extraoral examination, minor facial asymmetry was observed concerning the left side of the face. The clinical examination revealed a giant, solitary, lobulated painless mass of gingiva was seen in the region of 23, 24, and 25, measuring approximately 20 mm x 14 mm x 10 mm (Figure 9). Her oral hygiene was poor with an ample amount of plaque and calculus observed. The gingival hyperplasia had covered the occlusal third of her involved teeth causing hindrance in her mastication and speech functions.

She was also subjected to radiographic examination with the radiation exposure of 50 rad and her occlusal radiograph revealed the lining of the granuloma as radiolucency (Figure 10) and the intraoral periapical radiograph revealed periodontal ligament widening for 24. Based on her chief complaint and concerns regarding the enlarged mass, surgical excision of the lesion was performed using a scalpel and blade (Figure 11) during the 2^{nd} trimester of her pregnancy. After the successful excision of the mass, the specimen (Figure 12) was sent for histopathological examination. A bony exostosis (Figure 13) was seen at the surgical site, for which osseous reduction using a round bur (Figure 14) was performed and coagulation was achieved using a diode laser. Coe-pak was given for reduced patient discomfort.

Fig. 10: Occlusal radiograph revealing the lesion at initial presentation

The histopathologic diagnosis showed fibrous and edematous connective tissue along with the presence of inflammatory cells and confirmed the diagnosis of pyogenic granuloma with calcifications. Her healing was noted to be satisfactory after 1 week, 2 weeks, and 1 month after the surgery with no recurrence of the lesion (Figure 15).

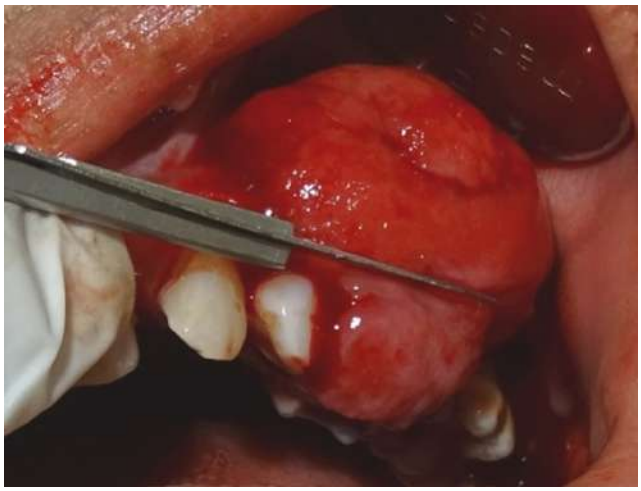

Fig. 11: Excision of the lesion using scalpel and blade

Fig. 12: Excised tissue

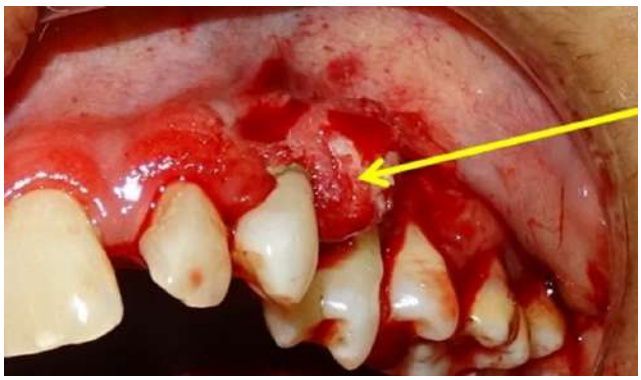

Fig. 13: Clinical picture presentation of a bony exostosis

Fig. 14: Intraoperative photograph showing osseous reduction concerning the bony exostosis

Fig. 15: Postoperative healing after 1 month

3. Discussion

Pyogenic granuloma or Pregnancy tumor is a type of benign inflammatory overgrowth that is characterized by proliferating vascular channels, immature fibroblastic connective tissue, and scattered inflammatory cells.[7] They are commonly small, round, and red with associated bleeding because of the increased number of blood vessels.[8] The majority of cases noted are symptomatic and may have nodules (71.9%), a mushy consistency (62.3%), and a red surface (73.2%).[9]

Chronic low-grade irritation, physical injury, hormonal variables, and some medications can be considered etiologic agents because it is a reactive tumor-like lesion.[10] Yuan et al.[11] had described the role of angiogenic factors in the occurrence of these. According to the literature,[5,11] female sex hormones supplement the expression of angiogenic factors such as basic fibroblast growth factor and vascular endothelial growth factor along with declining the expression of tissue necrosis factor-alpha which in turn causes diminished cell apoptosis.[12] Thus, pregnant women exhibiting the incidence of pyogenic granulomas commonly establishes significantly increased basic fibroblast growth factor, supplementary vascular endothelial growth factor, and fewer tumor necrosis factor-alpha.[12] Besides, certain medications like indinavir (Crixivan), isotretinoin

(Accutane), acitretin (Soriatane), and birth control pills can cause this overgrowth.[13] Systemic and topical retinoids, antiretrovirals, antineoplastics, and antineoplastics are also responsible for their manifestation.[13] It grows rapidly due to the rising levels of circulating estrogens and progestins and was first documented by Pinard and Pinard (1877).[14] However, it was first described by two French surgeons, Poncet and Dor in 1897.[15] Mild gingival inflammation caused by plaque, calculus, or trauma is sufficient to initiate the formation of the lesion, being aggravated by the hormonal imbalance during pregnancy.[16] Changes in gestational steroid levels do not necessarily cause the development of granuloma but might exacerbate the latent gingivitis, resulting in a heightened inflammatory tissue response, contributing to the progress of this proliferative lesion.[17] Also, the immunosuppressant effect of progesterone on the gingival tissues[18] inhibits a quick acute inflammatory response to plaque but allows for an enhanced chronic tissue reactivity, resulting in exaggerated inflammation.[19]

But this role of hormones was challenged by Nichols et al. (1992)[20] who stated that the periodontium lacks steroid hormone receptors and hence, the formation of this lesion is independent of estrogen or progesterone. However, Tumini et al. (1998)[21] claim that this lesion is caused by gingivitis, which leads to local hyperplasia. We experienced two of such pregnancy-related granulomas within a year, indicating the need to address its management in a detailed manner as it compromises the health of a to-be mother.

Numerous treatment modalities for its successful uneventful management are specified in the literature such as blade excision, electrocautery, cryotherapy, Nd: YAG laser, flash lamp pulsed dye laser, intralesional injection of ethanol or corticosteroids, and sodium tetradecyl sulfate sclerotherapy, etc. The treatment is of paramount importance because its size and position may interfere with mastication, compromising nutrition for the affected individual as well as for the development of the fetus. It also serves as a breeding ground for microorganisms, cumulating into periodontal disease and affecting aesthetics. Therefore, in our cases, as the gingival anomaly was huge, interfering with mastication and associated with profuse bleeding with or without stimulation instigating inadequate intake of nutrients for the mother, it was adamant that we perform the removal therapy before delivery breaking the stigma and it was completely safe for the mother as well as the child. The conservative surgical excision and removal of irritants are the most common treatment protocols followed, and we selected scalpel and blade for the conventional surgical removal of the lesion as it is effective enough to reach down to the periosteum. We used a diode laser to better achieve immediate coagulation and to have better aesthetic results in the first case. Therefore, for patients with unignorable signs and symptoms of overgrowth, removal of the pyogenic granuloma lesion is proved to be the best treatment option. Therefore, excision alone is sufficient to prevent its recurrence and comfort the patient, but the etiology and pathophysiology need to be understood to comprehend its nature.

4. Clinical Significance

The occurrence of granulomas in expecting female patients is a routine clinical discovery. But, the site of occurrence of such a lesion is of chief significance, as the rarity of these lesions is dependent on the site and size. This case series gives a complete description of the cases, highlighting the clinical and histopathological correlation of the lesion. It also solved a clinician's dilemma regarding the ideal time to perform treatment in an expecting mother as no recurrence for a follow-up period of 1 year was inspiring, stressing the accomplishment of the conventional method and the additive aid of lasers in such cases. This emphasizes the importance of thorough history taking, appropriate investigation, precise diagnosis, treatment planning, and consistent maintenance phase to prevent the recurrence of such lesions.

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