

# Gravidarum granuloma associated to an osseointegrated implant: case report

*Granuloma gravídico associado a implante osseointegrado: relato de caso*

Cleverson Luciano TRENTO<sup>a</sup>, Vanessa Cristina VELTRINI<sup>b</sup>, Rivelino Nímio Marques dos SANTOS<sup>a</sup>,  
Vanessa Tavares de GOIS SANTOS<sup>a</sup>

<sup>a</sup>UFS – Universidade Federal de Sergipe, Aracaju, SE, Brasil

<sup>b</sup>UEM – Universidade Estadual de Maringá, Maringá, PR, Brasil

## Resumo

**Introdução:** O granuloma piogênico é uma lesão oral reativa, benigna não-neoplásica que pode ocorrer em mulheres grávidas, conhecido como granuloma gravídico ou granuloma da gravidez. Geralmente é uma massa altamente vascularizada, tem característica exofítica, podendo ser sésil ou pediculado e, sua superfície costuma ter aspecto liso ou lobular, com coloração que varia de vermelha a rósea. A sensibilidade dolorosa irá depender do grau de injúria traumática que envolve a lesão, mas esta é frequentemente indolor. Áreas adjacentes a implantes são raras para o aparecimento de tal granuloma. **Objetivo:** O objetivo deste relato foi apresentar um caso clínico de granuloma piogênico, em região de gengiva lingual inferior, próximo a um implante osseointegrado, em uma paciente de 33 anos de idade, grávida de 3 meses, que possui a lesão desde o início da gestação. **Conclusão:** Granuloma gravídico foi diagnosticado em associação a um implante dentário. Isto evidencia a necessidade de reforço em higiene oral nas regiões peri-implantares. O tratamento cirúrgico com biópsia excisional e controle da higiene oral foram suficientes para resolução do caso.

**Descritores:** Granuloma piogênico; gestantes; implantes dentários.

## Abstract

**Introduction:** Pyogenic granuloma, known as gravidarum granuloma or pregnancy granuloma, is a benign non-neoplastic reactive oral lesion that may occur in pregnant women. It is usually a highly vascularized mass, which has exophytic characteristics, and it may be sessile or pedunculated. Its surface has usually a smooth or lobular aspect, with its coloration ranging from red to pink. The pain sensitivity will depend on the degree of injury involving the traumatic lesion, but it is frequently painless. Adjacent areas to dental implants are rare for the appearance of this type of granuloma. **Objective:** The aim of this case report was to present a clinic case of gravidarum granuloma in the region of lower lingual gingiva, adjacent to an osseointegrated implant in a 33-year-old woman, with 3 months of gestation, who had the lesion since the beginning of her pregnancy. **Conclusion:** Gravidarum granuloma was diagnosed in association to a dental implant, and it highlights the necessity for improvements of oral hygiene in the peri-implant regions. Surgical treatment with excisional biopsy plus hygiene control were enough to settle the case.

**Descriptors:** Granuloma, pyogenic; pregnant women; dental implants.

## INTRODUCTION

The pyogenic granuloma was first described in 1897 by Poncet and Dor<sup>1</sup> and named as botryomycosis, being the term pyogenic granuloma cited in "Skin Diseases" text in 1903 by Crocker<sup>2</sup> and used in the literature in 1904, after been inserted by Hartzell<sup>3</sup>.

Such injury is one of the five most frequent reactive lesions affecting skin and mucosa. Even without scientific evidence, it was once considered a fungal infection contracted through horses<sup>4,5</sup>. Currently, it is known that the main cause of their appearance is the exaggerated response of the organism to minor injuries or local irritants<sup>5</sup>.

The reactive oral mucosa lesions are common and usually present as a tissue resembling a tumor, known as epulis or granuloma. The pyogenic granuloma usually has characteristics of an exophytic mass and may be sessile or pedunculated and highly vascularized. Its surface usually has a smooth or lobular appearance and coloration ranging from red to pink. The pain sensitivity will depend on the degree of traumatic injury involving the lesion<sup>6</sup>.

The most common sites for the appearance of granuloma in the oral cavity, in descending order, are gums, tongue, upper lip,

hard palate and oral mucosa<sup>7</sup>. The most affected patients are in their second and third decades of life<sup>4,8</sup>, the majority being female and having white skin<sup>7,8</sup>.

Nowadays, the most common causes for the appearance of pyogenic granuloma are local trauma such as poor fitting dentures, chronic irritation, food impaction, dental plaque, dental calculus, hormones, drugs, gingival inflammation and pre-existing vascular lesions<sup>9</sup>.

When occurring in pregnant women, the lesion is called granuloma gravidarum, which affects about 5% of pregnant women<sup>10</sup>. There is evidence that hormones can alter the tissue response to dental plaque and influence on cytokine synthesis, particularly prostaglandins. However, not only pregnant women can develop this injury, but also women at puberty and those using contraceptive drugs<sup>11</sup>.

The occurrence period of such lesion in pregnant women is the second or third month of pregnancy and its incidence typically increases in the seventh month. It is believed that the gradual increase in estrogen and progesterone levels during pregnancy influence on the lesion gradual increase<sup>11,12</sup>. Differential diagnosis can be related with peripheral giant cell injury, capillary hemangioma, metastatic tumor, Kaposi's sarcoma, traumatic fibroma and angiosarcoma. The definitive diagnosis can only be made after histopathological analysis<sup>13-16</sup>.

Standard treatment consists of surgical removal of the lesion and elimination of causal factors<sup>7,17,18</sup>. Some authors recommend the use of carbon dioxide laser (CO<sub>2</sub>) and cryotherapy<sup>19,20</sup>. The recurrence rate according to Neville<sup>12</sup> is higher when the granuloma is removed during pregnancy. Therefore, treatment should generally be postponed, unless there are significant aesthetic and functional problems.

Despite advances in implant techniques, there are cases of this type of lesion in the peri-implant area. This may occur due to local trauma such as tooth extractions, poor fitting dentures, biofilm accumulation and food impaction<sup>21</sup>. Recently, associated angiogenesis factors were detected by immunohistochemistry in a group of granulomatous lesions, being accepted as a localized tissue reaction, exacerbated by small injuries or local irritant agents<sup>5</sup>.

This case report aims to describe a case of granuloma gravidarum associated with dental implant.

## CASE DESCRIPTION

A female patient, leucoderm, with 33 years old and 03 months pregnant, sought dental care in Oral Diagnostic Clinic from Federal University Hospital of Sergipe, Brazil, complaining of "a lump that rose in her mouth." During anamnesis, the patient reported that she had undergone dental implant treatment 6 years ago, in order to repair the area corresponding to tooth 36. A ceramic screw-retained implant was installed over an external hexagon implant system. The surgical placement of implants occurred satisfactorily without complications, having a good osseointegration and rehabilitation within normal range. Radiographically, there was no evidence of bone loss around the

implant and dental units nearby; the region had general aspects of normality (Figure 1).

The patient also reported that the lesion had appeared with the onset of pregnancy. Although painless, there was bleeding during tooth brushing and difficulty to clean the affected area. The extra-oral examination showed no abnormalities. The intra-oral examination showed a lesion located in the lower lingual gingiva, region of molar tooth 36. The oval-shaped lesion measured 13×09×07mm and had a pinkish color, with an irregular lobulated surface and sessile base (Figure 2).

Due to clinical findings and characteristics similar to the lesion presented by the patient, it was opted for the indication of three hypotheses to establish differential diagnosis: capillary hemangioma, pyogenic granuloma (gravidarum) and peripheral giant cell lesion. Considering the patient physiological state, a clinical diagnosis of granuloma gravidarum was made. As part of an initial therapy, sweeps with teflon curettes were performed in order to disinfect the prosthesis over the implant.

Discomfort and difficulty of cleaning the affected area were factors that aroused the interest of the patient for the lesion

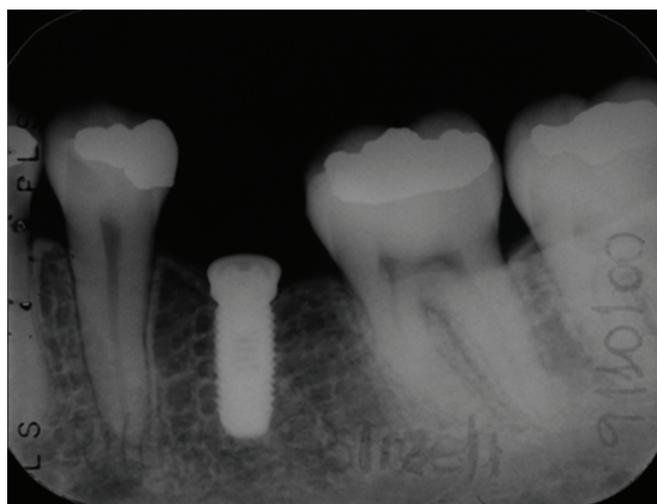


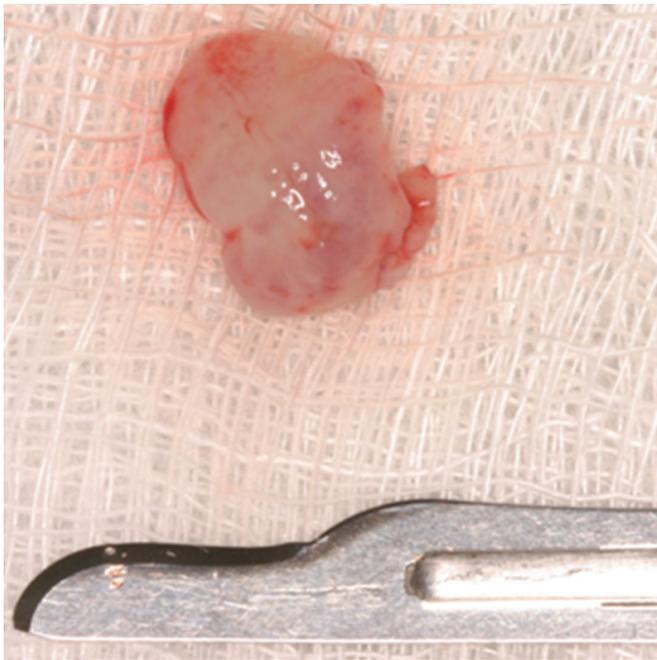
Figure 1. Radiograph aspect of the osseointegrated implant.



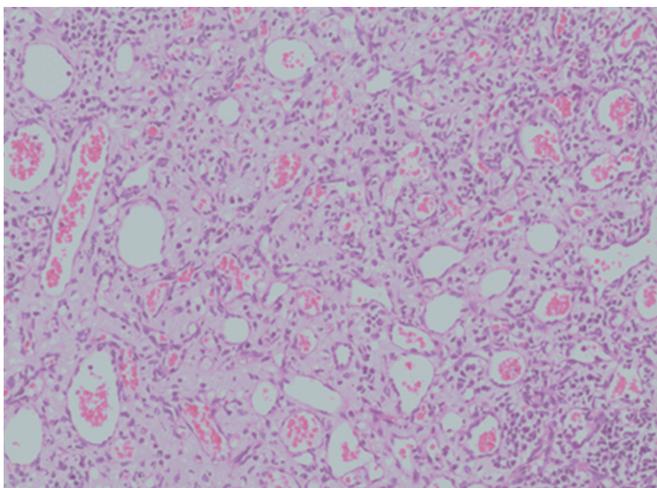
Figure 2. Clinical aspect of the initial lesion.

surgical removal. Laboratory exams - coagulation test, blood glucose and complete blood count - revealed a normal range of all parameters and, under local anesthesia (mepivacaine 2% and epinephrine 1:100,000), the lesion was completely removed through an excisional biopsy with a scalpel blade 15C. After the excision, periodontal dressing was applied to avoid trauma and improve healing. Nonsteroidal analgesics were prescribed for 3 days and the patient was instructed to maintain a proper oral hygiene, avoid masticatory trauma and perform regular follow-up visits. Figure 3 shows the surgical sample sent for histopathological analysis.

Histological sections revealed a fragment of mucosa lined by parakeratinized stratified squamous epithelium, predominantly ulcerated, with patches of atrophy. On the surface, there were fibrin and large amounts of polymorphonuclear leukocytes. Underlying this layer, an exuberant granulation tissue appears to be composed



**Figure 3.** Gingival tissue removed after tumor excision.



**Figure 4.** Photomicrograph of the granuloma gravidarum showing granulation tissue, angiogenesis lush and intense mononuclear inflammatory infiltration (HE staining, original magnification 10×).

of numerous newly formed blood vessels (angiogenesis), of different diameters and degrees of congestion, permeated by mononuclear inflammatory cells and often surrounded by loose and edematous connective tissue. Sporadic hemorrhagic foci completed the microscopic framework (Figure 4).

Considering these histopathological characteristics, the lesion was diagnosed as pyogenic granuloma (gravidarum). After the postoperative period of 20 days there was a satisfactory healing of the surgery area with no clinical signs of recurrence (Figure 5). The six months follow up (Figure 6) showed the absence of injury and complete state of normalcy.

## DISCUSSION

The granuloma gravidarum occurs during pregnancy with prevalence of 0.2 to 9.6%. This condition is also described as “pregnancy tumor” or “pregnancy epulis”, being histologically indistinguishable from pyogenic granulomas occurring in



**Figure 5.** Clinical aspect of the region postoperative 20 days.



**Figure 6.** Clinical aspect of the region postoperative 6 months.

non-pregnant women and men<sup>11</sup>. During pregnancy a woman undergoes some changes such as feeding frequency and dietary habits. In contrast, oral hygiene is compromised due to factors such as nausea and sleepness<sup>9</sup>.

Studies show that the increase of estrogen and progesterone cause changes in the gingival physiology, since gums have receptors for steroid hormones, which could enhance the tissue response to local irritants and change the local microbiota, with a predominance of more pathogenic microorganisms<sup>9,10,22</sup>.

Lindhe<sup>23</sup> believe that the signs of tissue destruction seem to be more pronounced in the implant than in the tooth. Pathological analysis of lesions in peri-implant lesions showed that, besides the presence of subgingival plaque and ulceration of the junctional epithelium, the apical extent of the inflammatory infiltrate seemed to be greater in areas with peri-implantitis when compared with periodontitis areas. This can be partially explained by the morphological changes of supra-alveolar fiber orientation. Thus, the peri-implant areas respond more prominently to the presence of inflammatory infiltrate than areas with natural teeth, which may favor the emergence of reactive hyperplastic lesions.

Several types of treatment for pyogenic granuloma are proposed in the literature, including preservation, surgical removal using CO2 lasers and Nd:YAG, the use of sclerosing substances, cryotherapy using liquid nitrogen spray and surgical removal with cold scalpel. Minor injuries can be accompanied just by a dental surgeon during and after pregnancy, since in some cases there may be spontaneous regression of the lesion or its fibrous maturation<sup>9,12,24</sup>.

The use of the Nd:YAG laser for the granuloma excision offers advantages in comparison to conventional surgical technique, especially by reducing the risk of bleeding, pain, discomfort and postoperative edema<sup>9,25</sup>, minimal invasiveness and no need of suture at the end of the procedure<sup>8</sup>.

The main indications for cryotherapy can be pyogenic granuloma, angiomas, actinic cheilitis, keratoacanthoma, fibroma, HPV lesions in HIV-positive and non-positive, hypertrophic lichen planus, leukoplakia, erythroplasia, verrucous carcinoma, mucous cysts, papillomatous hyperplasia of the palate, among others, having the advantage of not requiring the performance of aggressive interventions<sup>19,26</sup>. Moreover, it is a treatment without great cost, safe and easy to perform. However, the use of cryotherapy and laser as treatment modalities for oral pyogenic granuloma has not yet been fully assessed, requiring well-controlled prospective studies to complete the suitability of these modalities<sup>5,8</sup>.

The excisional biopsy (complete removal of the lesion) is consensus in the literature as the best therapy for the treatment of pyogenic granulomas by minimizing recurrences<sup>8,9,12,16,27</sup>.

These usually occur when deep satellite nodules, surrounding the original injury site, are not completely excised; when the etiological factors are unsuccessfully removed; or when there is a re-injury of the surgical area<sup>16</sup>. When surgical excision below the periosteum and removal of irritants are performed, the rate of recurrence of granuloma gravidarum is very low, comprising about 5% of cases<sup>5</sup>. Additionally, a careful management of the lesion should be performed at the same time to maintain and improve the mucogingival complex<sup>28</sup>.

In the case described, even with the patient in pregnancy status, surgery with cold scalpel was the procedure of choice, since, after successive sessions of scaling and cures with Teflon for disinfection of the peri-implant area, there were difficulties with its cleaning. Therefore the presence of plaque summed up the aesthetic and functional problems such as swelling and masticatory problems. Being a low-cost technique, with relative ease of implementation and providing satisfactory results, which usually leads to cure<sup>4,8</sup>, excisional biopsy was the approach adopted.

According to Jafarzadeh et al.<sup>9</sup>, one of the most common cause for the occurrence of pyogenic granuloma is the hormonal imbalance during pregnancy. Therefore, careful oral hygiene, removal of dental plaque and use of soft toothbrush are essential to avoid its occurrence in pregnant patients. It is important to notice a better sanitation of areas most prone to plaque buildup, such as prostheses on implants, other types of prostheses (fixed or mobile) and dental restorations.

The present report is limited to describe a granulomatous gravidarum lesion associated with prosthesis on implant unit. Further studies with larger sample sizes are essential to strengthen the idea of an association of hormonal changes of pregnancy with biofilm accumulation and the appearance of granulomas.

It should be emphasized the importance of a professional dealing with the oral cavity, especially dentists and otolaryngologists, in the recognition of reactive hyperplastic lesions, even when located in unusual sites, thus seeking early treatment. In addition, in order to obtain an adequate therapeutic approach, the correct diagnosis of these lesions should be performed, distinguishing them from other entities that have similar characteristics<sup>27</sup>.

## CONCLUSION

Granuloma gravidarum was diagnosed in association with dental implant. This highlights the need for enhanced oral hygiene in peri-implant areas, especially during pregnancy. Surgical treatment with excisional biopsy was enough for the case resolution, presenting favorable prognosis with no clinical signs of recurrence.

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## CONFLICT OF INTEREST

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The authors declare no conflicts of interest.

## CORRESPONDING AUTHOR

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Cleverson Luciano Trento  
Av. Deputado Sílvio Teixeira, 230, Apto. 603, Bairro Jardins, 49025-100 Aracaju - SE, Brasil  
e-mail: lucianokeko@hotmail.com

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