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SCLEROTHERAPY AS AN ALTERNATIVE THERAPY FOR RELAPSING PYOGENIC GRANULOMAS: LITERATURE REVIEW AND CLINICAL CASE REPORT

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ABSTRACT

Pyogenic granuloma is a common non-neoplastic proliferative lesion in the oral mucosa, characterized by an exaggerated inflammatory response to specific stimuli, such as trauma and local irritation. Although benign, pyogenic granuloma may relapse frequently, especially when predisposing factors are not specifically eliminated. The objective of this study was to report the case of a 29-year-old male patient with a recurrent lesion in the anterior region of the maxilla, presenting as pyogenic granuloma after histopathological examination. After two relapses, an alternative treatment using sclerotherapy with ethanolamine oleate (Ethamolin®) was proposed, resulting in a significant regression of the lesion with no signs of recurrence in a 2-month follow-up period. It is worth mentioning that this technique offers

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an effective and less invasive option for the treatment of vascular lesions, especially in cases of recurrence or aesthetic location.

Keywords: Pyogenic Granuloma, Sclerotherapy, Oral Lesions, Oral Pathology.

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INTRODUCTION

The oral cavity is often affected by various types of pathologies. Among them, we can highlight a group of lesions characterized by an exacerbated tissue response, called non-neoplastic proliferative lesions of the oral mucosa. These non-neoplastic proliferative lesions are due to tissue responses to long-term chronic stimuli, such as residual roots, poorly maintained teeth, poorly positioned teeth, subgingival stones, restorations with proximal excesses, inadequate prostheses, foreign bodies in the gingival sulcus, among other traumatic agents (4, 13).

These lesions do not have a neoplastic origin, but are associated with a chronic process characterized by exacerbated repair (granulation tissue and wound formation). Among these lesions, we can highlight pyogenic granuloma, which clinically presents as a localized growth polyp that can affect the mucosa and skin (8, 9, 19).

Pyogenic Granuloma is a benign multifactorial lesion caused by the disordered proliferation of inflammatory cells (5). It is more common in female patients, between 11 and 40 years of age, especially during pregnancy, a characteristic that also makes it known as Granuloma Gravidarum (5, 23). PG results from local, low-intensity, and long-lasting irritating factors, such as trauma, irregular margin restorations, stone accumulation, or biofilm, among other irritating factors(15).

The clinical characteristics of granuloma are the appearance of a single, pedicled nodule, usually bleeding to the touch, reddish or purplish in color, and painless. Histologically, it demonstrates lobulated masses of granulation tissue, partially covered by squamous, slender and atrophic epithelium, inflammatory infiltrate and the presence of circumscribed areas with endothelial proliferation and formation of vascular spaces (24, 25).

Regarding the diagnosis, the clinical aspect is suggestive, although not conclusive, and histopathological examination is therefore of fundamental importance(10). The histopathological aspect of the lesion reveals intense vascular proliferation, similar to a granulation tissue with the presence of numerous vascular spaces covered by endothelium and large fibroblastic proliferation, and the epithelium, when present, is atrophic and thin(11). The treatment of the lesion consists of its surgical removal, associated with the removal of the predisposing local factor, with a thorough curettage of adjacent teeth and root surfaces when necessary, in order to avoid possible recurrences (1, 20).

In the clinical case that will be presented, there were recurrences of the PG, therefore, in addition to excisional surgery, sclerotherapy was performed as a method of

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support for the treatment, in order to avoid possible future recurrences. Sclerotherapy is nothing more than a technique of intralesional injection of some sclerosing agent, which will promote inflammation of the blood vessels, occlusion and vascular sclerosis, resulting in the regression of the lesion (16).

LITERATURE REVIEW

Initially, this lesion was described by Porcet & Dor (1887), under the name of botrycotic infection. The name Pyogenic Granuloma was mentioned in the text "*Diseases of the skin"* by Croker (1903), and was then used in the world literature in 1904, after being inserted by Hartzell (1, 4, 11).

Pyogenic granuloma can also be called vascular epulid, angiomatous granuloma, benign vascular tumor, hemangiomatous granuloma, telangiectatic granuloma, Crocker's disease and Hartzells, and even during pregnancy it is commonly called gestational tumor or granuloma gravidarum (8, 12, 18, 19).

Pyogenic Granuloma is categorized as a PNPP, that is, a non-Neoplastic Proliferative Process, this is due to its hyperplastic reactive character, however there are still controversies about its exact etiology. It is considered that it can occur as a multifactorial reactional hyperproliferative vascular response, such as trauma, hormonal factors, drug therapy, and infectious agents (15, 25). On the other hand, some authors discuss that its etiology may be infectious, arguing that the presence of bacteria would be accidental, and not the fundamental motivation for its occurrence (7).

As for epidemiological aspects, there is a certain predilection of Pyogenic Granuloma for female patients, regarding age, this lesion is more commonly found in adolescents and young adults, there is no predilection for race and up to 50% of pregnant women can develop these gingival changes. The site most affected by GP is in the gums, most commonly in the maxilla, but it can also be found on the tongue, lips, jugal mucosa, and sometimes on the hard palate (17, 24).

The main differential diagnoses for this lesion are: Peripheral giant cell lesion, Kaposi's sarcoma, Fibroma, Keratoacanthoma, Squamous cell carcinoma, True hemangioma and some metastatic tumors in the early stage (12, 15, 25). Therefore, for the correct diagnosis, the dental surgeon must pay attention to the patient's history and clinical examination, in some cases an X-ray is performed and finally, the biopsy followed by the anatomopathological examination, which will provide a more accurate final diagnosis (25).

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Regarding the relevance of radiographic scans, some scholars differ in opinions, this is because the SG is a soft tissue lesion, which is not visible radiographically. However, the lesion results from microtraumas, and the examination may show dental and salivary calculus, poorly adapted restorations, or even discrete bone resorptions, which justifies the importance of the x-ray for the diagnosis (5, 23).

The most commonly performed treatment is conservative local excision associated with the elimination of the etiological determinant, since both incomplete removal of the lesion and non-removal of aggression factors may be indications of recurrence. Cauterization, curettage, laser separation, cryotherapy or photocoagulation can also be performed, but they remain less effective methods in terms of preventing recurrence of the lesion (7). Currently, new less invasive methods are being studied, such as sclerotherapy, which is widely used as a treatment for venous lake and hemangiomas. A very common sclerosing agent is Ethamolin® (OE5%), morruate and sodium psiliate have also been used, but they can cause pain, allergic reactions and even anaphylactic shock. Unfortunately, as complications of sclerosing therapy, symptoms such as pain, edema, redness and/or burning can be seen, which can last up to three days (6, 16). Another agent that can be used as a sclerosant is 3% sodium tetradecyl sulfate (Setrol), in this case, patients can usually be evaluated weekly over a period of one month, and it may be necessary to maintain and check for recurrences every 3 months for up to one year, according to the case (22).

The use of diode laser is also shown to be an alternative to treatment, since in post-surgical reports in cases of excision of the lesion, pain and edema are constant. Diode lasers have several benefits such as hemostasis, reduced pain and edema, and facilitated gum remodeling. This method has few complications, and according to evidence, induces complete epithelial photoablation, in addition to improving patient comfort during the postoperative period (2).

ANWAR *et. al.* (2020) conducted a research where 20 patients who had Pyogenic Granuloma were divided into two groups and treated separately to compare clinical aspects of diode laser treatment and sclerotherapy. At the end of the treatment, it was found that patients treated by sclerotherapy, compared to diode laser, had less intraoperative bleeding, lower levels of postoperative pain, no cases of recurrence and a higher cure rate. All this information proves that sclerotherapy is less traumatic, economical and simple to perform, in addition to presenting an important factor, which is to reduce the chances of recurrence.

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CLINICAL CASE REPORT

A 29-year-old male patient came to the Stomatology Clinic complaining that an old lesion had returned. According to the patient, there was a recurrence of a lesion in the anterior region of the maxilla (gums, above the incisors) that had been surgically removed about 1 year and 3 months ago, but at the time no histopathological examination had been performed and consequently there was no definitive diagnosis. He also reported that he was not submitted to subsequent clinical controls. Although the lesion was asymptomatic, it was gradually growing and hindering the performance of stomatognathic functions. Also during the anamnesis, no history of systemic disease or current medical treatment was reported.

Clinically, it was possible to observe facial asymmetry and difficulty of the patient in sealing the lips. On intraoral examination, it is possible to observe a nodular lesion, with an ulcerative surface, erythematous, oval with about 6 centimeters in its largest diameter, in the region of teeth 13 to 23. The presence of a lot of biofilm on the teeth was also shown in a generalized way (Figures 1 and 2).

Figures 1 and 2. Initial clinical aspect. Facial asymmetry, difficulty in sealing the lips, and exuberant nodular lesion in the upper anterior gingiva are noted.

A panoramic X-ray was requested, which found that there was no bone loss in the region affected by the lesion, as well as any bone involvement (Figure 3). Based on the evolution and clinical characteristics, the diagnostic hypotheses of pyogenic granuloma or peripheral giant cell lesion were reached.

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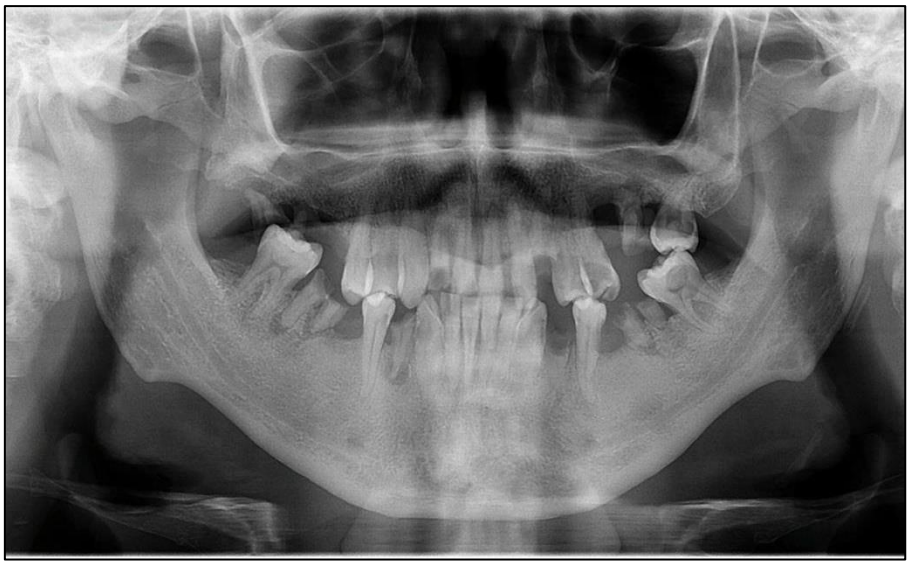
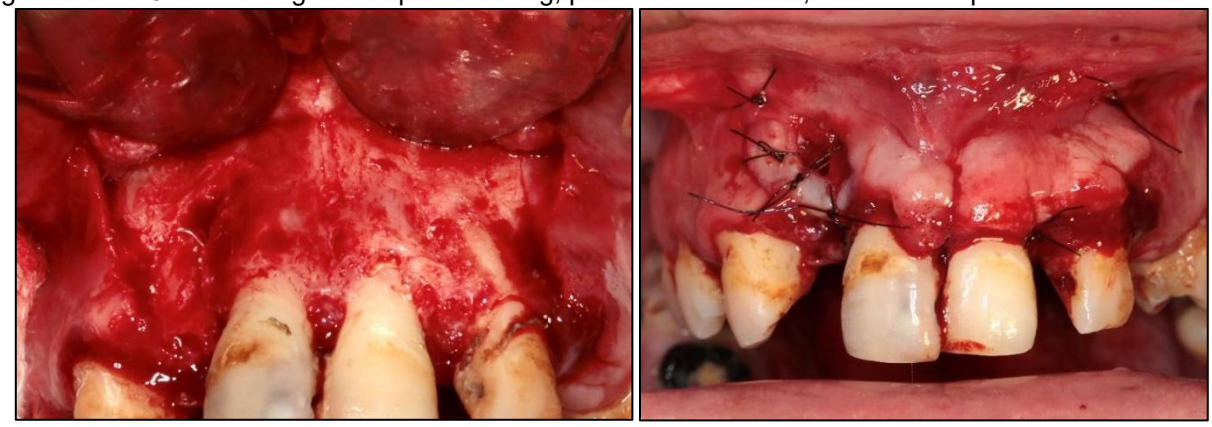
Figure 3. Initial panoramic x-ray of the patient. It is not possible to observe bone changes inherent to the injury.



In view of these diagnostic hypotheses, we opted for excisional biopsy associated with the patient's periodontal treatment. A surgical procedure was performed with a trapezoidal flap with two relaxing incisions in the region of teeth 12 to 22, excisional biopsy and meticulous curettage of the healthy tissue, removing the adjacent periosteum of 2 to 3 mm in length and subsequently sutured (Figures 4 and 5). The excised specimen was placed in 10% formaldehyde solution and sent to the laboratory for histopathological analysis.

Figures 4 and 5. Trans-surgical. Flap rebounding, periosteum removal, and tissue replacement for suturing.



Microscopically, it was possible to observe intense vascular proliferation, with a large number of vascular spaces covered by endothelium and an enormous fibroblastic proliferation, covered by an atrophic coating epithelium compatible with Pyogenic Granuloma.

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After 7 and 14 days of clinical follow-up, it was possible to observe that the surgical wound did not present dehiscences or secretions and that the healing process was favorable. The need for correct teeth hygiene was emphasized to avoid or minimize the possibility of new recurrences.

After 2 months of clinical follow-up, the wound was completely healed. However, in the same place where the lesion was removed, it already showed signs of recurrence (Figure 6). The need to clean the site was reinforced again with the patient and that, due to the beginning of the recurrence, a new procedure would have to be performed, but the patient refused to undergo a new surgery.

Figure 6. Clinical appearance after 2 months of clinical follow-up. Recurrence and accumulation of tartar and biofilm on the teeth is noted.

After the fifth month of clinical follow-up, the disease was already large and already made it difficult to perform stomatognathic functions (Figure 7). In view of the patient's refusal to undergo a new surgical procedure, an alternative therapy was proposed to the patient with the introduction of sclerosing agents. The patient was instructed about the possibility of failure of the technique and the immediate symptoms that the therapy could cause, such as pain and intense swelling at the site.

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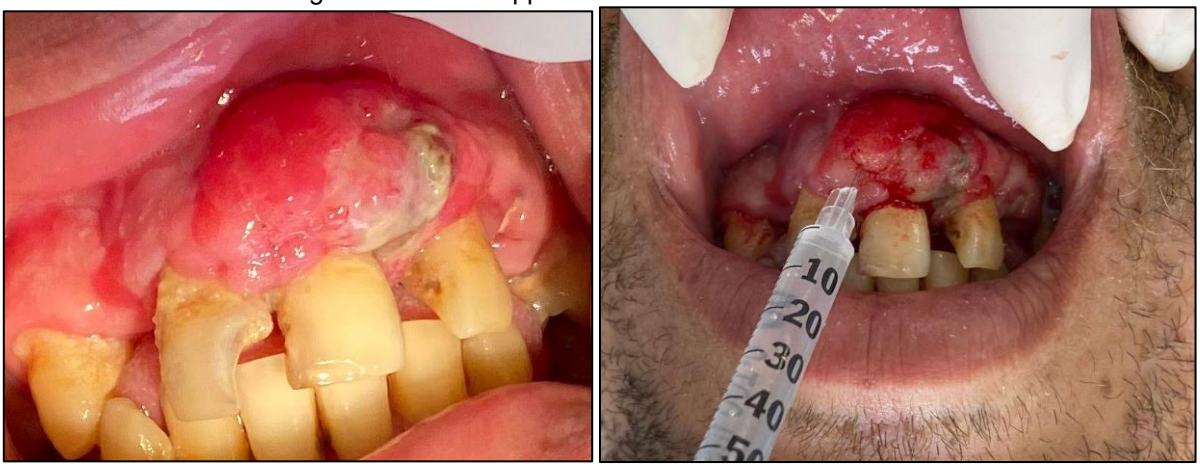
Figure 7. Clinical appearance after the fifth month of clinical follow-up. Recurrence of the lesion is observed.

Thus, 6 months after surgical removal, sclerotherapy was performed using ethanolamine oleate (Ethamolin®). 2 application sessions were performed, about 1 mL per session, with an interval of 14 days between them. After 7 days, partial regression of the lesion was observed, and after 14 days even more almost total (Figures 8 and 9).

Figure 8. Slight involution after the first sclerotherapy session.
Figure 9. Second application of ethanolamine oleate.



After 2 months, the patient remains under clinical control and, to date, with no signs of recurrence.

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DISCUSSION

Pyogenic granuloma is a benign reactive vascular lesion of the skin, mucosa, or gums. Its etiology is related to a chronic tissue response to trauma, repetitive reactions, and local irritants (1, 4, 8, 11, 19).

The female gender has a higher incidence of Pyogenic Granuloma, although there is an increase in the incidence in males and young individuals, with no defined etiology for these cases, but some predisposing factors such as poor oral hygiene, poorly positioned teeth, poorly adapted restorations, residual roots, exfoliation of deciduous teeth, bone spicules, traumas, plaque and calculus gum irritation (5, 11, 23). Corroborating the increase in the incidence of this lesion in males, a clinical case of Pyogenic Granuloma in a male individual was described here, in which poor oral hygiene was the predisposing factor of the lesion, thus being in accordance with the specialized literature.

According to JAFARZADEH *et.al.* (2006) pyogenic granuloma occurs more frequently in the anterior region of the maxilla, more specifically in the gingiva. Regarding age, according to ALSHUHAIL *et al.*, (2023), the lesion affects the age group between 11 and 40 years old, with a mean age of 36.4 years. The patient in the present case is 29 years old and the lesion developed in the anterior gingiva of the maxilla, as described by the authors researched.

Oral pyogenic granuloma usually presents as flat or lobulated masses, a color that varies from purplish red, its surface can be smooth or even ulcerated. With a rapid growth pattern, it usually stabilizes when it reaches an average total size of 0.5–1.0 cm (3, 20). However, in the case described here, we observed a lesion with dimensions much larger than those described in the literature.

Another relevant characteristic of Pyogenic Granuloma to be discussed is the presence or absence of painful symptoms. According to a study carried out by AVELAR *et. al.* (2008), only 21.5% of the patients reported discomfort, which is usually associated with bleeding from the lesion, as well as in the case of the patient, who reported discomfort and bleeding during brushing.

Surgical removal of the lesion is the recommended treatment (11). However, in addition to being more expensive and invasive, some patients have a lower tolerance for this type of procedure, such as young children and people with intellectual disabilities or anxiety. Therefore, less invasive methods have recently been preferable. Other techniques under analysis as substitutes for excision are cryosurgery, electrical cauterization,

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intralesional injections, yttrium-aluminum garnet laser doped with neodymium or erbium, laser and diode laser and, of course, sclerotherapy (1).

Several studies have found sclerotherapy to be an effective and safe alternative treatment, especially for large lesions, aesthetic area of the face, thicker in nature or located in an area of difficult access or even inaccessible for surgical treatment. Several studies report complete remission of the lesion after 1-4 applications of sclerosing agents within a weekly interval (22). Among the advantages of this method over other treatments is that it causes minimal discomfort to the patient, insignificant blood loss, requires little surgical experience, is low cost, does not require anesthesia, postoperative dressings or any specific care. On the other hand, it can be mentioned that it is contraindicated in cases of very extensive lesions with high flow, in which case it can be replaced by embolization of the main vessel and followed by excision (21).

According to AVELAR *et. al.* (2008), recurrences of Pyogenic Granuloma are not uncommon, and clinical follow-up is of great importance. The case described presents an atypical behavior. Although recurrences are considered common, the repetition of recurrences in such a short time, associated with the rapid evolution observed in the clinical case, diverges from what is reported in the literature. Therefore, sclerotherapy was used in order to prevent the reappearance of Pyogenic Granuloma. Complete excision of the lesion, with a safety margin, is still the most effective method, but in this case, it was necessary to associate it with sclerotherapy because there had already been two previous recurrences.

It is of great importance to know this lesion because, despite presenting common characteristics and being associated with frequent predisposing factors in the oral cavity of the general population, Pyogenic Granuloma is little known by dentists, a fact that often leads to an incorrect diagnosis and consequently there is an inadequate treatment.

In addition, the patient's instruction throughout the process is extremely important. The recurrence of Pyogenic Granuloma is often related to a failure to remove the causative factor of the lesion, therefore, in cases of poor hygiene, it is essential to guide the maintenance of oral hygiene, use of a soft brush to reduce abrasion and constant monitoring for prevention.

CONCLUSION

Pyogenic Granuloma is a relatively common lesion in the oral cavity. It has classic clinical characteristics, although it may eventually develop with aspects different from those

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described in the literature. In this way, it is essential that the dentist knows in depth all the ways that this lesion can develop so that he can choose the same way to treat it. Although traditional surgery is the most used form for its treatment, new therapies have shown promising positive results. Sclerotherapy is a method that has stood out for its effectiveness and its various benefits in the clinical treatment of Pyogenic Granuloma and other lesions of vascular origin such as hemangioma and venous lake.

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