Surgical Removal of an Oral Pyogenic Granuloma and Subsequent Root Coverage With a Pedicle Graft

Thais M. Oliveira, DDS, PhD *Sebastião L.A. Greghi, DDS, PhD*
Luís A.A. Taveira, DDS, PhD *Carlos F. Santos, DDS, PhD*
Maria Aparecida A.M. Machado, DDS, PhD *Salete M.B. Silva, DDS, PhD*

ABSTRACT

Pyogenic granuloma (PG) is a lesion characterized by non-neoplastic proliferation of endothelial cells, occurring in gingival tissue and representing an excessive reaction of the connective tissue to stimuli or injuries. The purpose of this report was to describe the treatment of an oral pyogenic granuloma, with emphasis on clinical, histopathological, and radiographic aspects. The surgical therapy comprised lesion excision followed by pedicle graft to cover the exposed root surface. The patient's pyogenic granuloma has been under control for a year, and recurrence has not been observed. The permanent teeth erupted correctly and the gingival tissue of both the receptor and donor sites shows a satisfactory clinical appearance. (J Dent Child 2008;75:55-8) Received March 24, 2006 | Last Revision August 18, 2006 | Revision Accepted October 27, 2006.

KEYWORDS: PYOGENIC GRANULOMA, PEDIATRIC DENTISTRY, PEDICLE GRAFT, ROOT COVERAGE

Pyogenic granuloma (**PG**) is a lesion frequently arising on the gingival tissue. It is an excessive reaction of the connective tissue to stimuli or injuries, and it is a non-neoplastic proliferation of endothelial cells. PG has been found in all age groups, although more commonly in children and young adults, predominantly in females.[1-4] It is typically deep red or reddish-purple due to its vascularity. Frequently, the lesion arises on the gingiva of the maxillary anterior region, but also it has been seen in the lips, tongue, and buccal mucosa.[2]

In a clinical examination, PG presents as an exophytic, pedunculated, or sessile mass. The surface can be smooth, lobulated, or ulcerated.[1,3-5] Most PGs present an inflammatory component due to local injury. In some situations, the response can be modified by the patient's systemic conditions.[2-4] PG's correct diagnosis requires anamnesis and clinical examination. Additionally, it is essential to use auxiliary diagnostic resources, such as radiographic examination and biopsy, to differentiate from inflammatory fibrous hyperplasia, peripheral odontogenic fibroma, and peripheral giant cell granuloma. Correct diagnosis also will guide the treatment.[4] Patients and dentists who are not used to this kind of lesion may become concerned because of its fast evolution and vascularization. It is important to emphasize, however, that the recurrence rate of an appropriately treated PG is low.

Histological examination consists of hyperplastic granulation tissue with proliferation of capillary endothelium and the formation of vascular spaces. When the lesion is ulcerative, the exam reveals ulcerated stratified squamous epithelium.[3,5]

Treatment consists of surgical removal, extending the incision up to the periosteum and periodontal ligament and involving the associated connective tissue as well as any other etiologic factor present.[1,3,6-7] Prognosis of PG's removal is favorable, although recurrence may be seen if the lesion is not totally excised.[6,7]

Dr. Oliveira is a former graduate student, Drs. Greghi and Silva are assistant professors, and Drs. Machado, Taveira, and Santos are associate professors, all in the Bauru School of Dentistry, University of São Paulo, Bauru, São Paulo, Brazil. Correspond with Dr. Santos at cebola@usp.br.

CASE DESCRIPTION

A 7-year-old Caucasian girl was referred to our institution for management of an oral manifestation. After reviewing her medical history and anamnesis, the patient's mother reported a lesion on the anterior maxillary gingival tissue, which bled during brushing. She said that when the child was 2 years old, the primary maxillary right central incisor had suffered trauma and intrusion. This trauma probably caused enamel hypoplasia on the permanent maxillary right central incisor's facial aspect. The primary tooth erupted again 6 months after the trauma and exfoliated when the child was 6 years old. The permanent maxillary right central incisor erupted shortly thereafter. A red lesion appeared on the permanent maxillary right central incisor, which bled easily upon the lightest touch. Therefore, the affected area could not be cleaned correctly.

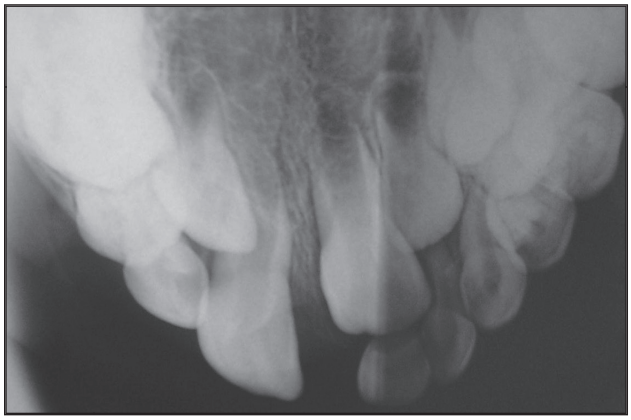

Figure 1. Initial occlusal radiograph showing no bony involvement.

An initial radiographic examination did not show any bony involvement (Figure 1). The intraoral examination revealed an area with gingival hyperplasia in the form of a red, nonedematous, pedunculated lesion extending to the vestibular and cervical area of the permanent maxillary right central incisor (Figure 2). Since the lesion appeared to be a gingival inflammatory reaction with a suspicious diagnosis of PG, the patient underwent an incisional biopsy.

Figure 2. Frontal view of the affected area.

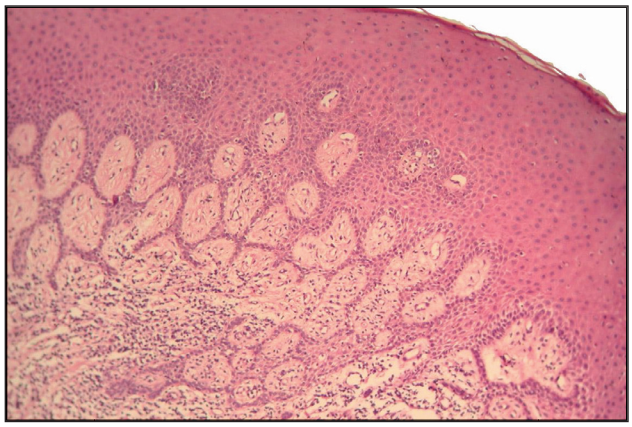

Figure 3a. Stratified squamous parakeratinized hyperplastic epithelium below the connective tissue (original magnification X10).

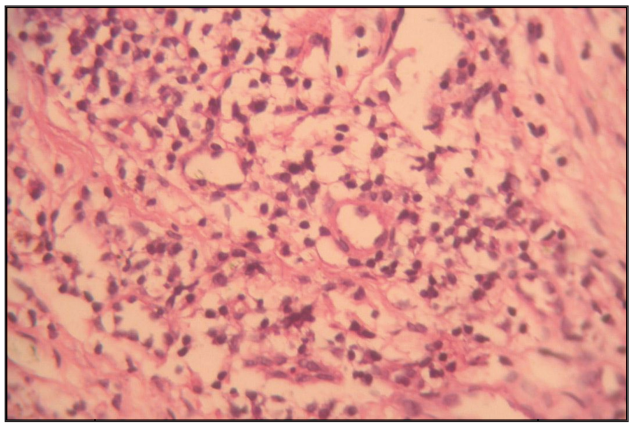

Figure 3b. Vascular spaces with proliferation of capillary endothelium (original magnification X40).

The histological examination showed a buccal mucosa with stratified squamous parakeratinized hyperplastic epithelium below the connective fibrous tissue (Figure 3a). Detected were hyperplastic granulation tissue with proliferation of capillary endothelium and the formation of vascular spaces with an intense mononuclear infiltrate (Figure 3b). Also observed was underlying fibrous connective tissue with plentiful blood vessels and intense infiltrated inflammatory mononuclear cells. These findings confirmed the diagnosis of PG.

Internal bevel gingivectomy was performed to remove the lesion. It included some healthy tissue and subjacent periosteum to eliminate the risk of recurrence (Figure 4). The prominent maxillary labial frenum was undermined. After the lesion was removed, the vestibular area of the permanent maxillary right central incisor had part of the root exposed. Therefore, pedicle grafting was performed using the laterally positioned split-thickness flap from the permanent maxillary left central incisor to cover the root surface and a portion of the alveolar marginal bone (Figures 5 and 6). The surgical site was sutured (using a palatally anchored suspensory suture and simple sutures on the facial aspect; Figure 6). Nonabsorbable suture material was used, which was removed on the seventh postsurgical day. The wound was covered with a Coe-Pak surgical dressing (GC AMERICA INC., Alsip, IL, USA) for 14 days.

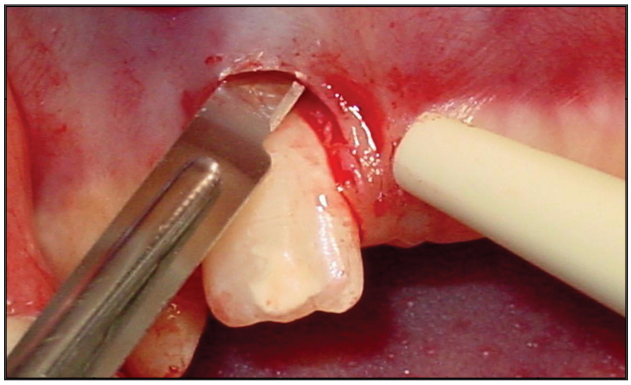

Figure 4. Surgical incision at the vestibular area of the permanent maxillary right central incisor for lesion removal.

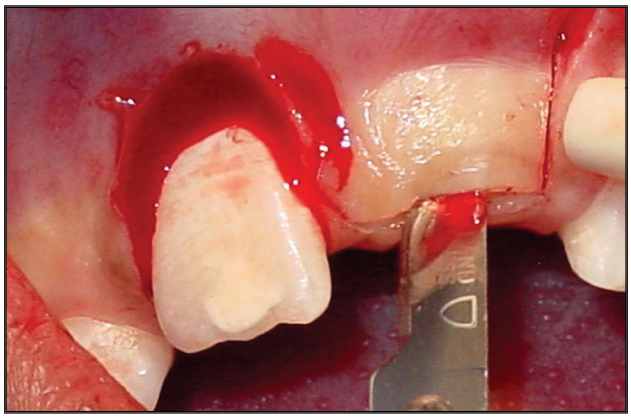

Figure 5. Blood clot formation and laterally positioned split-thickness flap for adjacent root coverage.

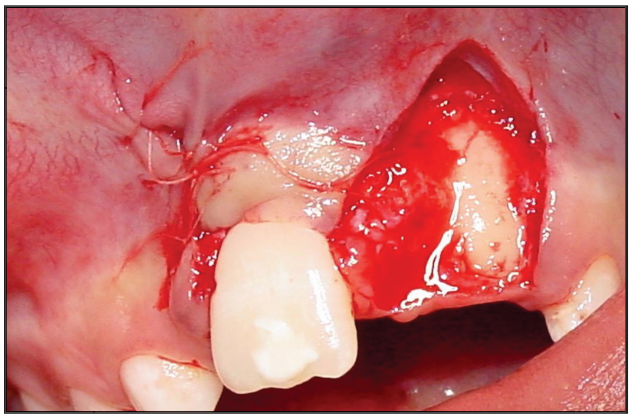

Figure 6. Immediate postoperative aspect after excision of pyogenic granuloma and pedicle grafting. Donor area was covered with surgical dressing (not shown).

The patient followed a plaque control protocol, which included daily rinsing with 0.12% chlorhexidine gluconate for 7 days and professional cleaning once every 2 weeks for 2 months. The patient was asked to abstain from mechanical oral hygiene procedures for 24 hours after the surgery.

The patient has been under control for a year, and recurrence has not been observed. The radiographic examination did not show any bony involvement (Figure 7). The permanent teeth erupted correctly, and the gingival tissue of both the receptor and donor sites showed a satisfactory clinical appearance (Figures 8 and 9).

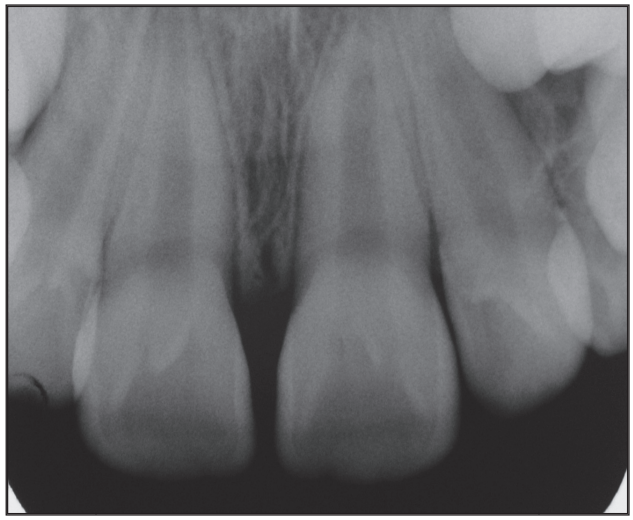

Figure 7. One-year postoperative periapical radiograph after surgical excision of pyogenic granuloma and pedicle grafting.

Figure 8. Seventh postoperative day aspect after surgical excision of pyogenic granuloma and pedicle grafting.

Figure 9. One-year postoperative aspect after surgical excision of pyogenic granuloma and pedicle grafting.

DISCUSSION

Most of the histological characteristics of this patient's PG are equivalent to those described in other studies.[1,3,5,8-9] PG's clinical features may indicate the nature of this lesion, but the final diagnosis is only accomplished with a histopathological examination.[1,3,5-6,8,10]

PG is relatively common on the gingiva of the anterior maxillary region, probably due to the prevalence of local irritating factors. [2,4,7,9-11] It often seems to follow a minor injury and grows rapidly over a period of a few weeks. It bleeds easily and may ulcerate.[1,3-4,7,8-11]

The lesion's etiology is unknown. It may originate as a response of tissues to minor trauma, chronic irritation, hormonal influences, viral oncogenes, and underlying microscopic arteriovenous malformations. The production of angiogenic growth factors also has been postulated to play a role.[9,10] Hormonal and other factors seem to modify the response under certain circumstances and promote the development of hyperplastic granulation tissue.[12] PG can occur at any age, but it is seen most often in children and pregnant women.[1-4,9-11] In this clinical case, primary tooth intrusion, microtrauma of the gingival tissue during brushing, and/or tooth eruption may be associated with the development of PG.

Lesion removal is indicated to alleviate any bleeding, discomfort, cosmetic distress, and incorrect or retarded tooth eruption. The suitable surgical approach, according to case reports in the dental literature, is complete excision.[6,13-15] PG recurs occasionally, possibly due to incomplete excision or failure to remove etiologic factors. Reports have shown that the lesions were successfully treated with a series of intralesional corticosteroid injections, chemical cauterization, cryotherapy, and lasers.[10,16]

In the present case, due to the lesion's location, the root surface was exposed after surgical removal of the PG. Many mucogingival surgical techniques designed to cover exposed root surfaces are reported.[17-19] Among these techniques, only the coronally positioned graft and the laterally positioned split-thickness flap have been shown to successfully cover large areas of exposed root surfaces[17-19]; therefore we chose the latter.

In summary, the present case shows the clinical features of an oral PG and corroborates that the final diagnosis is only accomplished with a histopathological examination. The most suitable treatment is complete lesion removal along with stimulus or injury elimination. Depending on the lesion's localization, root coverage may be required after excision.

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