CASE REPORT

Expansive Oral Giant Cell Granuloma in a Pediatric Patient

Pau Cahuana-Bartra[1], Lluís Brunet-Llobet[2], Mariona Suñol-Capella[3], Jaume Miranda-Rius[4]

Abstract

Aim: This article describes a peripheral oral giant cell granuloma (POGCG) in a pediatric patient and its surgical management and histological characteristics.

Background: Peripheral oral giant cell granuloma (POGCG) is a hyperplastic reactive lesion formed by a proliferation of mononuclear cells and osteoclast-type giant cells in vascular tissue, occasionally with bone formation. Generally found in women and adults, POGCG has rarely been described in children.

Case description: An 8-year-old girl was consulted for an exophytic lesion in the anterior area of the upper jaw, which had increased in volume in the preceding weeks. An excisional biopsy of the tumor was performed with an electrosurgical pencil. The pathological diagnosis was POGCG.

Conclusion: Excision followed by additional therapy, such as scaling and curettage, should be the first option in the treatment of POGCG.

Clinical significance: Early detection of these lesions involving the periodontium is important in order to reduce bone loss and avoid pathological dental migration.

Keywords: Giant cell lesions, Gingival tumor, Hyperplastic reactive lesion, Peripheral oral giant cell granuloma.

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Background

Gingival enlargement is an abnormal overgrowth of the gum. Etiologically, it may be due to multiple factors such as inflammation, hormonal changes, drugs, neoplasms, and genetic conditions, or it may be of idiopathic origin.[1,2] In advanced stages, this gingival dimorphism may impair masticatory function.[3]

Giant cell granuloma is a hyperplastic reactive lesion associated with different tissues of the oral cavity. Several varieties exist, depending on the location, etiology, and clinical course.[4] POGCG is the most frequently found benign lesion in the jaws; it may affect any area of the alveolar mucosa and originates in the connective tissue of the periodontal membrane or of the periosteum.[5] Its incidence is highest between the 30s and 60s, and it is more predominant in women;[6] only 9.5% of cases occur in children under 10 years of age.[7] Clinically, it appears either as a smooth, firm, shiny nodule or alternatively as a mass that may be sessile or pedunculate, and the color varies from darkish red to violet or blue; its surface occasionally appears ulcerated.[3,5] Histologically, it is a well-defined, non-encapsulated mass containing numerous scattered mononuclear spindle-shaped cells and osteoclast-like multinucleated giant cells in a vascularized stroma.[3] Treatment consists of surgical excision of the lesion, with a wide curettage of its base and subsequent removal of irritants so as to avoid recurrence.[8] In this article, we present a clinical case of a POGCG in a pediatric patient and its surgical treatment.

Case Description

An 8-year-old girl with no relevant medical history consulted the dentistry service of the Sant Joan de Déu Children's Hospital in Barcelona for an exophytic lesion in the anterior area of the upper jaw.

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Although she did not present bleeding, she reported slight discomfort when chewing and brushing. Around 3 weeks after the initial symptoms, a tumor appeared without any apparent cause and progressively increased in size.

Clinical examination identified first phase mixed dentition and absence of caries. There was an interincisal anterosuperior gingival tumor between teeth 11 and 21 (Fig. 1A), pedunculate hard but not causing pain with a base of 8 mm and a maximum diameter of 18 mm.

An intraoral radiography examination was performed to rule out any possible periodontal vertical defect or trabecular bone disorder around the lesion (Fig. 1B).

With a presumptive diagnosis of pyogenic or telangiectatic granuloma, it was decided to perform surgical excision of the

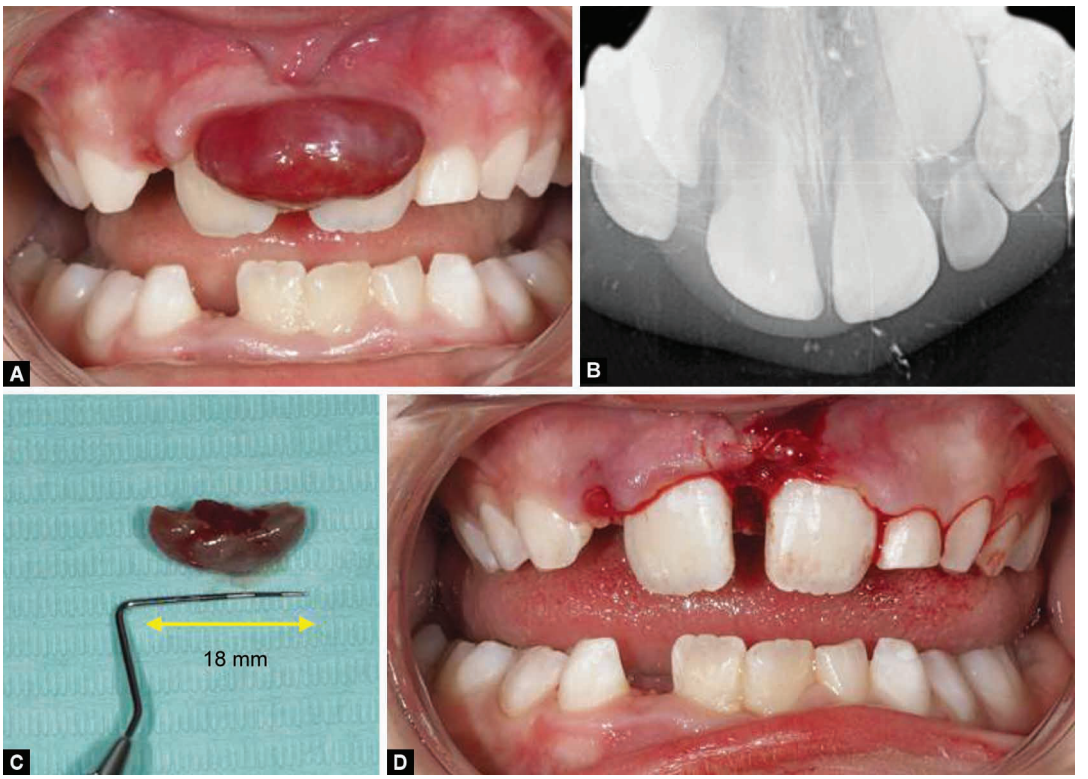
tumor under oral sedation with midazolam (0.3 mg/mL) in order to calm the patient and infiltrative local anesthetic. The excision of the tumor was carried out with an electrosurgical pencil, curettage of the area, absorbable suture to preserve the interincisal papilla, and gauze with tranexamic acid applied locally in order to control bleeding (Figs 1C and D). Ibuprofen 400 mg and amoxicillin 250 mg/mL were prescribed once every 8 hours for 6 days.

The specimen (18 × 8 × 5 mm) was immersed in a formaldehyde solution and sent to the hospital's pathology department. Histological study revealed the lesion to be composed of mononuclear, polygonal, and spindle cells with abundant mitotic figures and also multiple multinucleated osteoclast-like giant cells. A markedly hemorrhagic background was observed (Figs 2A to C). The pathological diagnosis was POGCG. After 12 months of evolution, the wound had healed, and the appearance of the gingiva was normal (Figs 3A and B).

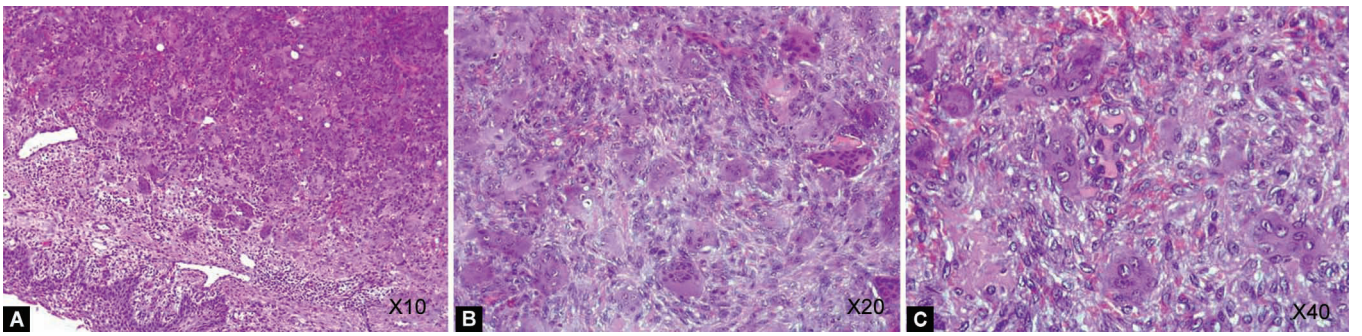
Discussion

Peripheral oral giant cell granuloma (POGCG) was first described in 1953 by Jaffe and was originally termed reparative giant cell granuloma.[9] In fact, it is not a genuine tumor but a benign hyperplastic reactive lesion generated by chronic trauma or local irritation.[3–5] It is more frequently located in the anterior mandible than in the upper jaw, but there is no clear prevalence with respect to the different regions of the maxilla. Usually recorded in women and in adults, very few cases have been reported in children: in a sample of 2,824 cases described in the literature, its prevalence is 9.5% in patients under 10 years of age.[7] Its etiology is unknown and controversial. Some authors suggest that it is caused by an abnormal proliferative response to an injury to the tissue.[10]

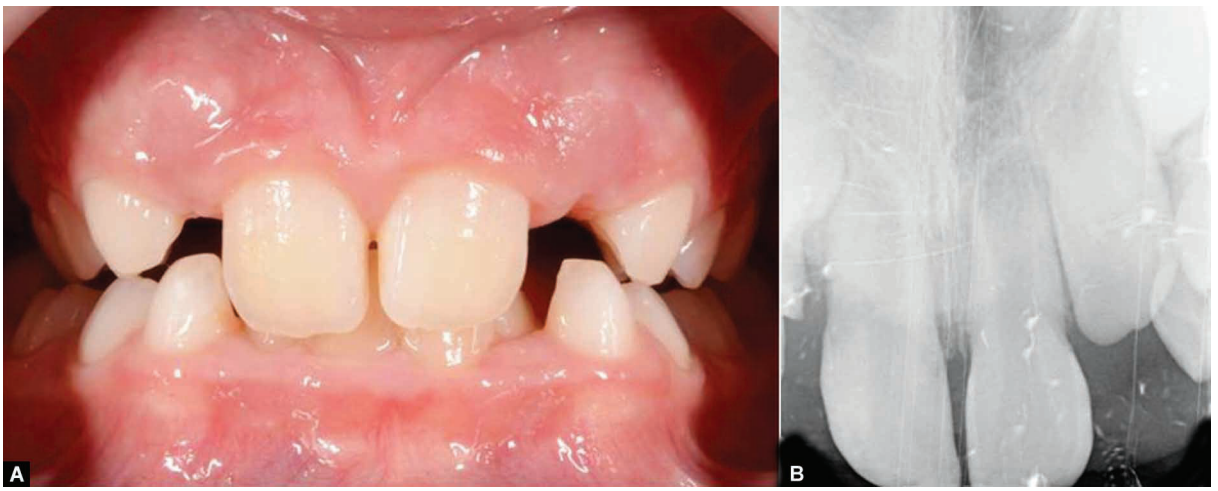
In the case presented here, no previous periodontal trauma had been reported. The lesion was located in the



Figs 1A to D: Clinical and radiological intraoral images of the exophytic lesion. (A) Violaceous mass located between the upper central incisors, (B) X-ray image of normal bone around the incisors; (C) Postexcision specimen: note its large size; (D) Immediate postoperative image after suturing of the region and marked interincisal diastema



Figs 2A to C: Histological features. (A) Lesion of the oral mucosa covered by squamous epithelium (×10); (B) Multiple osteoclast-like giant cells (×20); (C) Mononuclear and multinuclear cells in a vascular stroma (×40). (hematoxylin and eosin, original magnification)



Figs 3A and B: Clinical and radiological monitoring images after twelve months. (A) Intraoral image with correct gingival morphology and spontaneous closure of the interincisal diastema; (B) Favorable evolution of root development

interdental papilla, and the presumptive diagnosis was pyogenic granuloma (PG). This hypothesis has also been put forward in some case reports, and some authors attribute the lesion to trauma.[11,12] Volpato et al. described peripheral giant cell granuloma in a 4-year-old patient with the habit of picking his teeth and "poking" the gingiva.[13] Other possible factors that have been proposed (though not demonstrated) include hormonal alterations, primary hyperparathyroidism, tooth extraction, poor oral hygiene, old dental restorations, food impaction, orthodontics, bacterial plaque, and dental calculus.[14] In children, cases of more aggressive POGCG have been described, with resorption of the interproximal ridge, displacement of adjacent teeth, and multiple recurrences.[8,15,16] Clinically, this type of injury is variable, and its evolution is difficult to predict. It is a small, well-defined, reddish-blue focal mass (<15 mm) in the gingiva with a pedunculate or sessile base in the periodontal ligament or the mucoperiosteum. The fundamental clinical sign is inflammation, with or without mobility of the adjacent teeth.[3,8]

The term "giant cell lesions" of the maxillofacial area includes a range of nosological entities—central or POGCG, cherubism, as well as cystic lesions. There is some controversy regarding the etiology (i.e., neoplastic or reactive) and its name (reparative giant cell granuloma or giant cell tumor). Histologically, all three lesions present abundant multinucleated giant cells.[17] Studies of the origin of this disease have concluded that although peripheral and central giant cell granulomas do not have a genetic profile, and although cherubism has mutations of the *SH3BP2* gene, the three entities have similar cytological and histological characteristics. In addition, evaluation of the expression of the *c-Src* gene has suggested that it may be involved in the development of the three entities.[18]

In the histopathological examination, POGCG is characterized by a mass of non-encapsulated tissue comprising a reticular and fibrillar connective tissue stroma with dense, ovoid, and spindle-shaped fibroblasts and multinucleated giant cells.[19,20] Treatment consists in removing the entire tumor base along with any local irritants.

Central giant cell granuloma is a rare, locally aggressive, and destructive (though histologically benign) osteolytic lesion of osteoclastic origin found in the craniofacial region, above all in the jaw bones.[21] Radiographic study of this solitary lesion reveals a multilocular radiolucency with scalloped margins and the appearance of honeycomb or soap bubbles. It represents <7% of all benign tumors of the jaws. When located in the mandible, it tends to appear in the body, anterior to the first molars. It is usually recorded in patients under 30 years of age and is more frequent in females (62%).[22]

In patients with central giant cell granuloma, analysis of levels of parathyroid hormone in serum may be indicated to rule out multiple osteolytic lesions caused by excessive osteoclastic activity (as in Brown's tumor,[23] for example). However, our patient's tumor only affected the soft tissues, and there was no involvement of the alveolar bone.

Pyogenic granuloma (PG) has been defined by some authors as an inflammation of fibrous and granulation tissue and by others as a common, non-neoplastic, tumor-like growth of the oral cavity or skin.[24] Histologically, it is partially or totally covered by a parakeratotic or non-keratinized stratified squamous epithelium. The connective tissue presents low levels of collagen. Microscopic examination shows profuse vascular proliferation consistent with granulation tissue.[25] Blood vessels frequently show a lobular grouping or pattern separated by less vascular fibrous septa, which has led some authors to suggest that PG is a polypoid form of capillary hemangioma or merely an inflamed lobular haemangioma. Others favor the use of the term "granulation-type hemangioma."[24,25]

Peripheral ossifying fibroma (POF) is a lesion that is sometimes ulcerated and inflamed but does not present the purple or blue discoloration associated with POGCG.[26] Histologically, POF presents with an intact or ulcerated stratified squamous epithelium. The fibroblastic component is predominantly cellular, with calcification in central areas.

The mineralized tissue may comprise bone, cement-like material, dystrophic calcification, or a combination of all three. POFs are more cellular than fibromas and less vascular than PG.[26,27] Radiographically, POFs may present diffuse radiopaque nuclei with calcifications, but these characteristics are not found in all lesions.[27]

Long-term follow-up after surgical excision is essential. The early diagnosis of POGCG allows more conservative surgery, with a lower risk of injury to the tooth and a lower loss of bone tissue.[28]

Conclusion

Excision, followed by additional therapy, such as scaling and curettage, should be the first option in the treatment of POGCG.

Eliminating etiological factors and examining the resected tissues in order to establish a histopathological diagnosis is important for the management of this lesion.

Clinical Significance

Early detection of these lesions involving the periodontium is important in order to reduce bone loss or pathological dental migration.

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