

Peripheral Giant Cell Granuloma Associated with the Eruption of a Maxillary Central Incisor

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Abstract

Peripheral giant cell granulomas (PGCGs) are reactive, exophytic gingival growths, caused by regional irritation and chronic trauma. PGCGs are diagnosed through histopathologic evaluations and appear analogous to other soft tissue lesions. This report presents the case of a PGCG associated with the ectopic eruption of a maxillary central incisor. Following an excisional biopsy, the patient healed fully without recurrence for at least 1 year.

Key words : Peripheral giant cell granuloma, Excisional biopsy, Tooth eruption

I. Introduction

A peripheral giant cell granuloma (PGCG) is a localized hyperplastic gingival enlargement. It is an intermittent oral lesion that originates in interdental tissues, periosteum or periodontal membranes[1]. PGCG is caused by regional irritation or chronic trauma due to sub-gingival plaque and calculus[2-4]. PGCG presents as a smooth-surfaced nodule, that is red, purple or blue[4,5]. Surgery is required to excise lesions, and occasionally there is a requirement for subsequent grafting[2,6]. The lesion recurrence rate is approximately 10%; however, multiple recurrences with inevitable loss of the adjacent teeth are a potential complication. In children, PGCGs grow rapidly within several months of the initial diagnosis[2].

II. Case Report

A 6-year-old female attended the Department of Pediatric Dentistry at Yonsei University with swelling on the palatal marginal gingiva of the upper right central incisor. An operculectomy was performed in a local clinic to correct the delayed eruption of the upper right central incisor; however, gingival swelling remained following tooth eruption. The patient had good oral hygiene with no systemic disease or family medical history.

Upon intra-oral examination, a solitary exfoliated lesion was observed on the palatal gingiva of the upper right central incisor (Fig. 1). Tenderness was observed upon palpation and hemorrhaging occurred readily. The affected tooth was dislocated distolabially.

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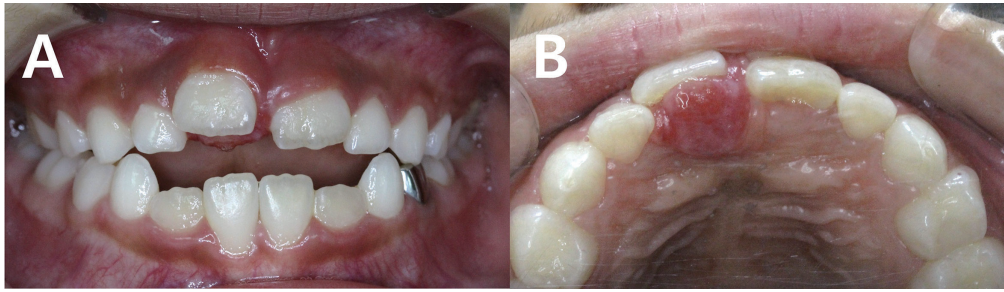


Fig. 1. Intraoral photographs obtained during initial evaluation of the 6-year-old female patient. A lobulated lesion and dislocated tooth are shown on the palatal gingiva.



Fig. 2. Periapical radiograph obtained during the patient's initial evaluation. No pathological findings were observed.

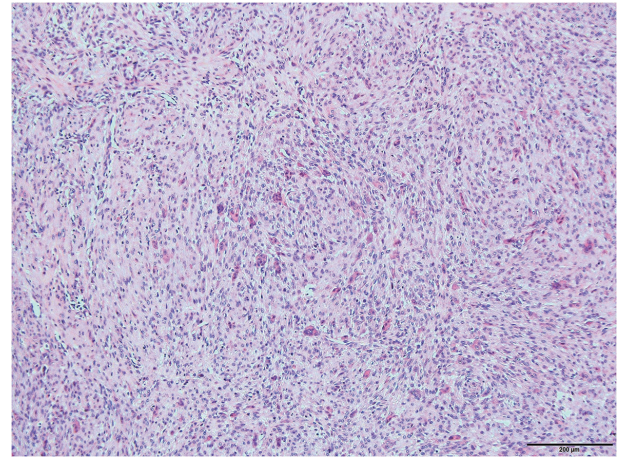


Fig. 3. Histopathological examinations revealed multinucleated giant cells within a well-vascularized mesenchymal cell proliferation (H-E, x 100).

An intra-oral periapical radiograph (Fig. 2) failed to reveal abnormal pathology.

No changes to the lesion were observed within 2 weeks following surgery, and a $0.9 \times 0.4 \times 0.2 \text{ cm}^3$ excisional biopsy was performed under local anesthesia. A histological evaluation using light microscopy revealed multinucleated giant cells within a cellular, well-vascularized mesenchymal proliferation (Fig. 3). The histological diagnosis was giant cell granuloma.

During the 1-year follow-up period, no significant changes were observed. Spontaneous closure of the space between the central incisors was observed and the maxillary right central incisor aligned within the anterior maxillary arch (Fig. 4, 5).

III. Discussion

Jaffe[7] first coined the term "giant-cell reparative granuloma" for a central lesion in the jaw bones. Bernier and Cahn[8]

used the term "peripheral giant cell reparative granuloma" to describe peripheral lesions. The etiology of PGCG is unknown[4], but it is generally accepted that the term originated to describe regional irritation or trauma - due to calculus, periodontal disease, periodontal surgery, food impaction, orthodontic appliances, or defective restorations with overhanging margins, ill-fitting removable appliances, or implants[8-10].

PGCG occurs in individuals of all ages[11]; however, the most widely affected individuals are those in their fourth[4] to sixth[12] decades of life. PGCG also varies in terms of oral location; with occurrence in the posterior region and mandible being more common than in the anterior region and maxilla[4,11-13]. PGCG lesions form in the interdental papilla of dentate areas, as well as the edentulous alveolar margin and marginal gingival levels[2,6,13].

PGCG lesions are firm, soft, bright, pedunculated, or sessile nodules of varying size, with most being less than 2 cm in



Fig. 4. Intraoral photographs obtained (A, B) 1 week, (C, D) 4 months, (E, F) 1 year following biopsy. No signs of recurrence were observed and the upper right central incisor was adequately aligned in the anterior maxillary arch.



Fig. 5. Periapical radiograph obtained 1 year after surgery revealed no pathological findings.

diameter[2]. The lesions are red, purple, or blue appear with and ulcerated surface[12]. They are not painful and growth is induced by chronic trauma.

Since PGCG is a soft tissue lesion, the underlying bone is rarely affected. Radiography is used to determine the size and

origin of lesions, as well as to reveal superficial erosion or cupping of the crest of the interdental bone or alveolar bone margins[2]. Widening of the periodontal ligament and tooth mobility may also be seen on radiographs[3]; however, such traits are not always present in PGCG cases[12].

Lester *et al.*[12] and Katsikeris *et al.*[4] suggested the histology used to diagnose PGCG. A nodular proliferation of mesenchymal tissue with abundant multinucleated giant cells covered by stratified squamous epithelia, as well as stromal cells consisting of plump spindle-shaped and ovoid mesenchymal cells with variably sized nuclei are the primary features. Abundant capillaries, inflammatory cells, hemorrhaging, and hemosiderin are also indicative of PGCG. In the present case, cellular, vascular and fibrous stroma containing scattered mitotic figures were observed.

Since the clinical appearance of PGCG is similar to that of several other lesions, differential diagnosis is necessary. Central giant cell granulomas (CGCGs) have a similar histology to PGCGs; however CGCGs are aggressive, intraosseous lesions[11]. Additionally, CGGs are painful and cause bone and dental root

resorption, necessitating radiological analyses to distinguish between PGCGs and CGCGs.

PGCG must also be differentiated from pyogenic granulomas, parulis, peripheral ossifying fibromas and hemangiomas[2,12]. Pyogenic granulomas do not cause alveolar bone loss, nor do they disturb tooth positioning. Parulis is caused by entrapped foreign bodies or non-vital teeth. The occurrence of pain and purulent exudate enable differentiation of parulis from PGCG. Peripheral ossifying fibromas rarely occur in children, and are not purple or blue. Occasionally, however, peripheral ossifying fibromas exhibit small calcified foci upon radiographic examination. Hemangioma causes rapid hemorrhaging, increased tissue, temperature and blanching upon palpation. Fatima *et al.*[15] reported that PGCGs were misdiagnosed 89% of the time; thus, clinical, radiographic, and histopathologic evaluations are required for correct diagnosis[16].

Treatment of PGCG requires complete surgical excision[12] and the prevention of irritating factors[13]. Incomplete excision, which occurs in approximately 10% of cases caused regrowth[4,13]; therefore, postoperative evaluations are necessary for early detection.

The present case was notable since PGCG occurred in the maxilla, and was associated with the eruption of a maxillary central incisor. In children, reactive gingival lesions, including PGCGs, grow rapidly within several months following diagnosis. Lesions can resorb bone, interfere with tooth eruption, and cause tooth movement[3]. Therefore, early diagnosis of PGCG is necessary for adequate management and the prevention of tooth and bone loss.

IV. Summary

PGCGs are reactive, exophytic gingival growths, caused by irritation or trauma from subgingival plaque and calculus. In the case described here, PGCG was associated with the eruption of a maxillary central incisor. Soft tissue lesions occurring in the oral cavity of children require early detection, treatment and routine evaluations to prevent recurrence and ensure normal tooth eruption and well-aligned dentition.

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국문초록

상악 중절치아의 맹출과 관련되어 발생한 말초성 거대세포 육아종

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말초성 거대세포 육아종은 국소적인 자극 또는 만성적인 외상에 의해 발생하는 구강 내의 반응성, 증식성 병소이다. 유사한 형태의 다른 연조직 병소와의 감별진단을 위해서는 병리조직학적 검사가 필요하다. 본 증례는 상악 중절치의 맹출 시기에, 해당 부위에 발생한 말초성 거대세포 육아종에 대해 절제생검을 시행하였고, 1년 경과 관찰 시 재발 없이 양호한 치유 결과를 나타내고 있기에 보고하는 바이다.