Case Report

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Electrocautery-assisted Surgical Excision of Pyogenic Granuloma in Maxillary Posterior Region of an 11-year-old Girl: A Case Report

Dentistry Section

DEVYANI TAORI[1], MONIKA KHUBCHANDANI[2], HARIKISHAN KANANI[3], RUTUJA PATIL[4], GUNJAN DARE[5]

ABSTRACT

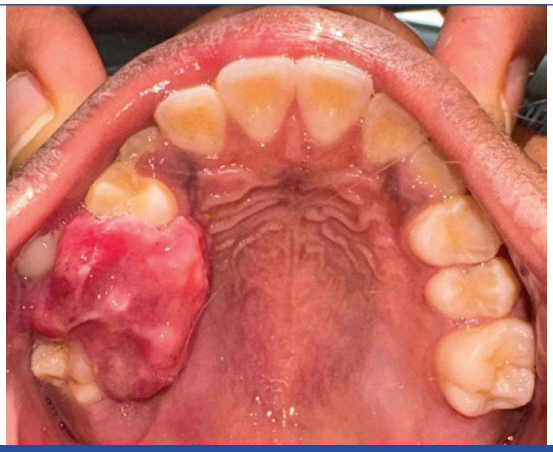
An exaggerated inflammatory tissue reaction brought on by persistent local irritation or trauma can result in a benign, reactive, non neoplastic oral mucosal lesion known as a pyogenic granuloma. Clinically, pyogenic granuloma most commonly affects the gingiva and accounts for a significant proportion of reactive gingival enlargements, with a higher prevalence reported in the maxillary arch and on the facial aspect of the gingiva. It presents as a smooth or lobulated exophytic growth with a sessile or pedunculated base, ranging in colour from pink to deep red, and often exhibits a tendency to bleed on slight provocation due to its vascular nature. For such cases to be successfully managed, early identification of local etiological factors and appropriate treatment planning are crucial. The present case report highlights the role of local irritational factors and the efficacy of electrocautery in the clinical presentation and management of a pyogenic granuloma in the maxillary posterior region of an 11-year-old female who reported with a chief complaint of swelling in the upper right back region of jaw since 10 days. The growth measured approximately 2×2 cm. The lesion was associated with a mobile deciduous second molar. A provisional diagnosis of pyogenic granuloma was established, and the lesion was excised using electrocautery after removal of the causative primary tooth and satisfactory healing was observed. Pyogenic granuloma is believed to be caused by reaction to ongoing low-grade irritation. The main goals of its management include eliminating the irritants that cause pyogenic granuloma and conservative surgical excision should be planned for such cases.

Keywords: Child, Gingival enlargements, Local anaesthesia, Oral pathology

CASE REPORT

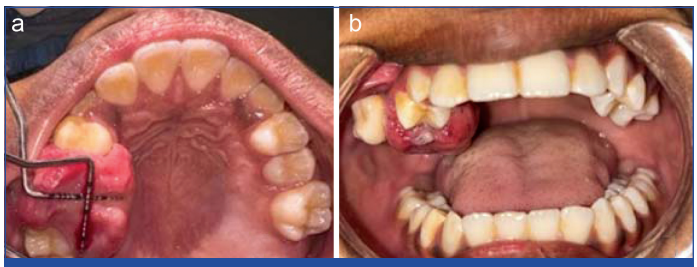
An 11-year-old female reported to the Department of Paediatric and Preventive Dentistry with a chief complain of swelling in the upper right back region of jaw since ten days. The lesion had an insidious onset and was initially noticed as a small painless reddish swelling by the patient's parent. Over time, the swelling gradually increased in size and attained the current dimensions. The growth was associated with occasional bleeding during tooth brushing and on mastication. The patient did not report any history of trauma, fever, pain, pus discharge, or systemic illness. There was no significant medical and dental history.

On intraoral examination, a solitary, well-defined, exophytic tissue growth was seen in the maxillary right posterior gingival region which extended anteroposteriorly from distal aspect of right maxillary first premolar to mesial aspect of right maxillary first molar and mediolaterally from the marginal gingiva onto the palatal mucosa. The swelling appeared to be reddish-pink in colour with lobulated surface and a sessile base as seen in [Table/Fig-1].

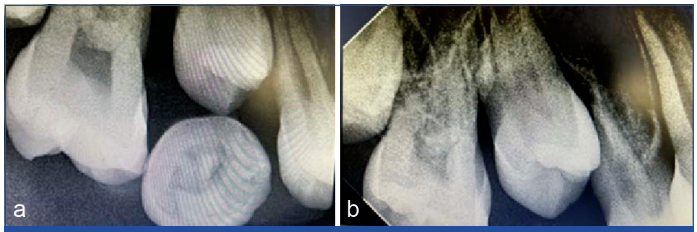


[Table/Fig-1]: Occlusal view of maxillary arch showing swelling that appeared to be reddish pink in colour with lobulated surface and a sessile base.

The growth measured approximately 2×2 cm as shown in [Table/Fig-2a]. On palpation, the lesion was soft to firm in consistency, non-tender and bleeding was seen on slight provocation. The right maxillary second deciduous molar was attached buccally to the lesion as shown in [Table/Fig-2b], and was clinically mobile, suggestive of a local irritating factor which might be the cause for development of the lesion. The adjacent permanent teeth were firm and non mobile. On radiographic examination, intraoral periapical radiograph showed over retained right maxillary primary second molar [Table/Fig-3a] and erupting permanent second premolar with no evidence of significant bone loss, resorption or any damage to the underlying and adjacent permanent teeth and no bony involvement was noticed, the origin of lesion was considered from the peripheral soft-tissue as seen in [Table/Fig-3b].



[Table/Fig-2]: a) Lesion measuring approximately 2×2 cm; b) Second deciduous molar attached buccally to the lesion.

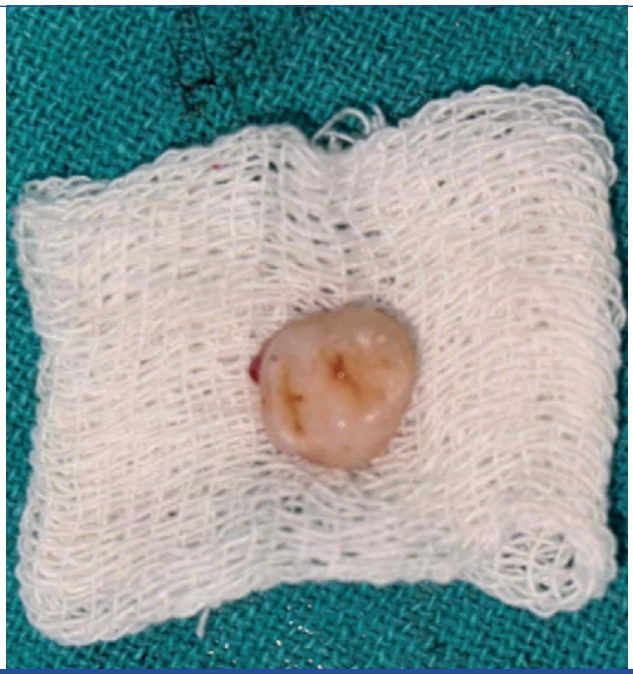


[Table/Fig-3]: a) Preoperative radiograph showing overretained right maxillary primary second molar; b) Preoperative radiograph showing erupting permanent second premolar.

Based on clinical findings, a provisional diagnosis of a granulomatous lesion was considered suggestive of pyogenic granuloma. The differential diagnosis included peripheral giant cell granuloma, peripheral ossifying fibroma and traumatic fibroma.

Considering the clinical features, size of the lesion and its tendency to bleed, complete surgical excision using electrocautery was planned. Written informed consent was obtained from the patient's parent prior to the procedure for the treatment and regarding publication of clinical photographs. Before proceeding with the surgical excision, a complete hematological evaluation was carried out, which revealed haemoglobin to be 12.2 g/dL, total white blood cell count to be 10,200/mm^3, total platelet count was 3.17 lacs/mm^3 bleeding time was two minutes and 40 seconds and clotting time was six minutes 52 seconds. In coagulation profile, Prothrombin Time (PT) and Activated Partial Thromboplastin Time (aPTT) were also assessed which were within normal physiological limits, suggestive of an adequate coagulation status.

The procedure was carried out under 2% lignocaine containing 1:80,000 adrenaline under infiltration of local anaesthesia. Initially, the primary maxillary second molar was extracted as it was considered to be the cause of irritation as shown in [Table/Fig-4].



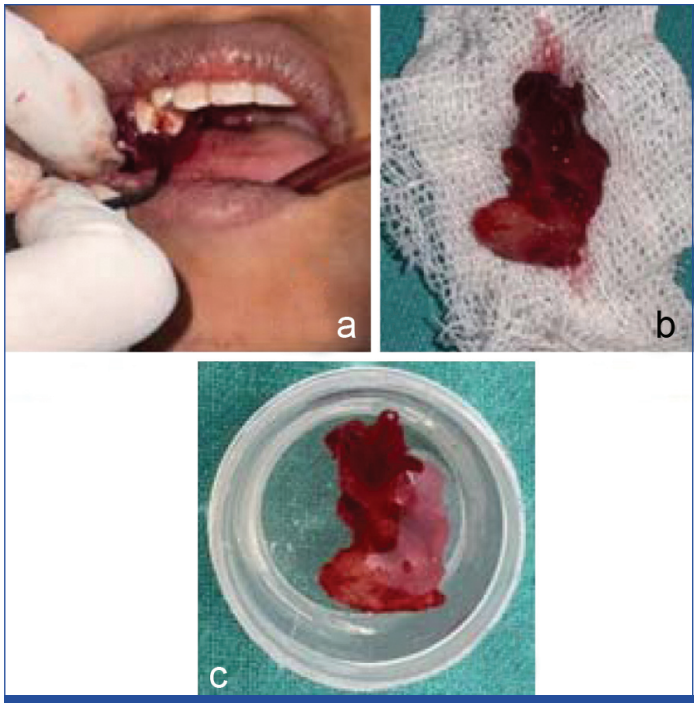
[Table/Fig-4]: Extracted right primary maxillary second molar.

Following extraction, a circumferential incision was made around the base of the lesion using electrocautery. The electrosurgical unit was operated in cutting mode using a cutting electrode with a power setting of 50W at 230V, 50Hz, and 1.25 A and it was excised. The excised specimen was placed in 10% formalin and further sent for histopathological examination as seen in [Table/Fig-5a-c]. Following the excision, surgical site was thoroughly inspected and debriding was done.

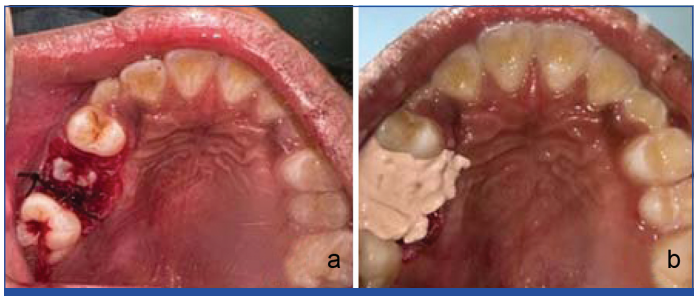
The margins of the lesion were distally secured using a 3-0 black silk sutures [Table/Fig-6a]. After suturing, periodontal dressing was placed over the site for the protecting the site by facilitating uneventful healing as seen in [Table/Fig-6b].

Haemostasis was found to be satisfactory at the end of the treatment. Postoperative instructions were given and the patients were instructed to maintain proper oral hygiene and avoid trauma to the surgical site and medications that included analgesics and was advised to maintain proper oral hygiene. Patient was recalled after seven days.

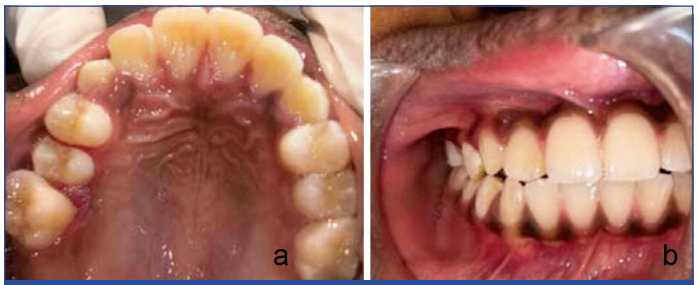
Periodontal dressing and suture removal was done after seven days and satisfactory healing was observed after 14 days as shown in [Table/Fig-7a,b,8].



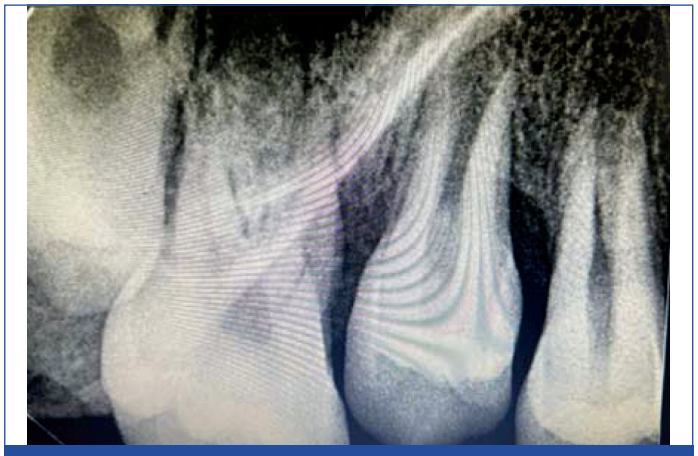
[Table/Fig-5]: a) Surgical excision of the lesion with electrocautery; b) Excised lesion; c) Placement of tissue specimen in 10% formalin.



[Table/Fig-6]: Post-excision site showing a) Suture placement followed by b) Periodontal dressing.



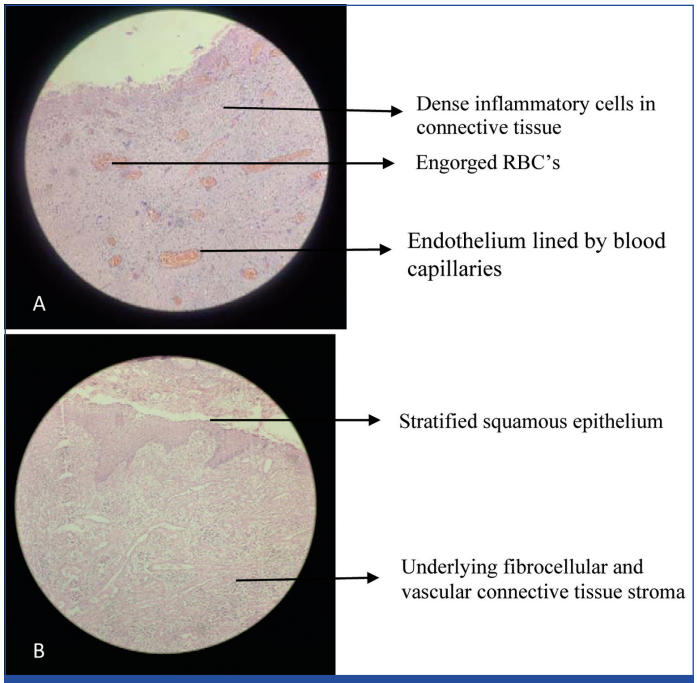
[Table/Fig-7]: Surgical site showing satisfactory healing after 14 days post-excision: a) Maxillary view; and b) Occlusal view.



[Table/Fig-8]: Postoperative radiograph at 14 days follow-up.

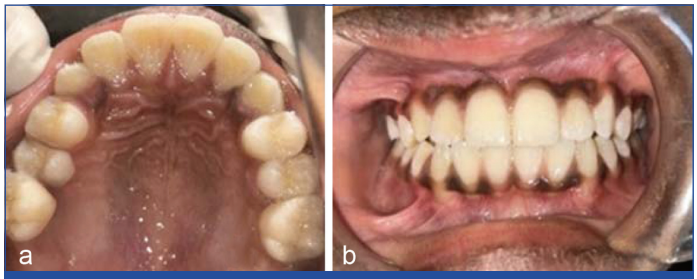
Histopathological investigation of the excised lesion revealed shows numerous proliferating blood vessels, many of which are engorged

with red blood cells. The vessels appear capillary-sized and are arranged in clusters/lobular aggregates. Mild to moderate chronic inflammatory cell infiltrate is evident. Histopathological findings verified the excised lesion as a pyogenic granuloma as shown in [Table/Fig-9a,b].



[Table/Fig-9]: a) Histopathological section showing numerous proliferating blood vessels with dense chronic inflammatory cell infiltrate (H&E, 10x); b) Histopathological section with low power showing lobular arrangement of proliferating vascular channels within fibrocellular connective tissue stroma (H&E, 4x).

Patient was recalled after one month, clinical examination revealed satisfactory healing of the surgical site, there were no signs of recurrence noticed as seen in [Table/Fig-10a,b]. Although no recurrence was observed at the one-month follow-up, longer follow-up is necessary for definitive assessment of recurrence. The patient is further called for follow-up after 3, 6, 9 and 12 months.



[Table/Fig-10]: One month follow-up images showing satisfactory healing: a) Maxillary view; b) Occlusal view.

DISCUSSION

Pyogenic granuloma is a benign, reactive, non neoplastic oral mucosal lesion which arises because of an exaggerated inflammatory tissue reaction due to chronic local irritation or trauma. The term 'Pyogenic granuloma' is recognised as misnomer in oral pathology as it neither produces pus nor represents a true granulomatous process [1].

The lesion was first described by Hullihen in 1844, and the term "Pyogenic granuloma" was later introduced by Hartzell in 1904, so it is also known by the name "Hartzell's disease" [2].

Oral PG often affects people between the ages of 4.5 and 93. It is most common in the second and fifth decades, and it frequently affects women more than men [3,4].

Clinically, pyogenic granuloma most commonly affects the gingiva and accounts for a significant proportion of reactive gingival enlargements, with a higher prevalence reported in the maxillary arch and on the facial aspect of the gingiva. It presents as a smooth or lobulated exophytic growth with a sessile or pedunculated base, ranging in colour from pink to deep red, and often exhibits a tendency to bleed on slight provocation due to its vascular nature [5].

Although oral pyogenic granuloma can occur at any age, it shows a higher prevalence in females during the second decade of life, attributed to hormonal influences [6]. The present case involving an 11-year-old girl further supports the reported female predominance of this lesion in the paediatric age group.

Jafarzadeh H et al., stated that in children, local factors such as exfoliating deciduous teeth, erupting permanent teeth, and difficulty in maintaining adequate oral hygiene predispose the gingival tissues to chronic low-grade inflammation, resulting in an exaggerated reactive tissue response [5]. In the present case, the lesion was closely associated with a mobile maxillary deciduous second molar, which likely acted as a persistent source of irritation and contributed to the initiation and progression of the lesion.

Similarly, Vilmann A et al., reported that repeated local trauma, including mechanical irritation from teeth or surrounding oral structures, plays a significant role in the development and recurrence of gingival pyogenic granuloma [7]. In the present case, a mobile maxillary deciduous second molar was found to be partially embedded within the granulomatous tissue, acting as a continuous source of local irritation. Additionally, the parent reported a habit of the child repeatedly manipulating the mobile deciduous tooth with the tongue, which may have further aggravated the inflammatory response. Extraction of primary tooth before the excision of the lesion was therefore considered necessary to remove the causative factor and minimise the risk of recurrence.

Peripheral giant cell granuloma, peripheral ossifying fibroma, metastatic cancer, haemangioma, pregnancy tumour, conventional granulation tissue, hyperplastic gingival inflammation, Kaposi's sarcoma, bacillary angiomatosis, angiosarcoma, and non-Hodgkin's lymphoma are among the differential diagnoses for pyogenic granuloma [5].

Peripheral giant cell granuloma is difficult to distinguish from pyogenic granuloma. Peripheral giant cell granuloma is typically bluish to purple in colour, as compared to red coloured pyogenic granuloma. Radiographically, peripheral giant cell granuloma is more likely to result in bone resorption than that of pyogenic granuloma [8].

Clinically, pyogenic granuloma typically presents as a raised soft tissue growth with either a smooth or irregular surface and may be attached to the underlying tissue by a broad base or a narrow stalk. The lesion often demonstrates a tendency for rapid enlargement over a short period. Although its size may vary considerably, ranging from small focal swellings to larger masses [9]. In the current case, the lesion appears to be a lobulated exophytic growth with a sessile base measuring 2×2 cm, which is consistent with the commonly reported clinical size and growth pattern of pyogenic granuloma.

Similar paediatric case reports have been documented in literature where pyogenic granuloma was associated with local irritational factors such as mobile deciduous teeth and poor oral hygiene [10]. Pyogenic granuloma has a 15% recurrence incidence, which is linked to insufficient lesion excision and a failure to remove underlying etiological factors [11].

Electrocautery was selected as the treatment modality in the present case because the lesion demonstrated a highly vascular nature with bleeding on slight provocation. Compared to conventional scalpel excision, electrocautery provides superior haemostasis, improved visibility of the surgical field, reduced operative time, and simultaneous cutting with coagulation. These advantages are particularly beneficial in paediatric patients, where better bleeding control and shorter chairside duration improve patient management and cooperation [1,12].

The current case report highlights the importance of early recognition of local etiological factors and its elimination which would help prevents its progression and recurrence. Electrocautery-assisted surgical excision would serve as an effective treatment modality in children due to better haemostasis. Long-term follow-up and maintenance of oral hygiene should be emphasised to minimise the recurrence and improve treatment outcomes.

CONCLUSION(S)

Pyogenic granuloma is a benign inflammatory lesion that is believed to be caused by reaction to ongoing low-grade irritation. The unique clinical features of Pyogenic granuloma make it easy to diagnose, because of its close clinical resemblance to neoplastic conditions, it is imperative to recognise these lesions in order to prevent misdiagnosis, and histopathological confirmation is always advised. The main goals of its management include eliminating the irritants that cause pyogenic granuloma and, in the majority of cases, utilising conservative surgical excision should be planned.

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PARTICULARS OF CONTRIBUTORS:
1. Postgraduate Student, Department of Paediatric and Preventive Dentistry, Sharad Pawar Dental College, Datta Meghe Institute of Higher Education and Research, Wardha, Maharashtra, India.
2. Reader, Department of Paediatric and Preventive Dentistry, Sharad Pawar Dental College, Datta Meghe Institute of Higher Education and Research, Wardha, Maharashtra, India.
3. Postgraduate Student, Department of Paediatric and Preventive Dentistry, Sharad Pawar Dental College, Datta Meghe Institute of Higher Education and Research, Wardha, Maharashtra, India.
4. Postgraduate Student, Department of Paediatric and Preventive Dentistry, Sharad Pawar Dental College, Datta Meghe Institute of Higher Education and Research, Wardha, Maharashtra, India.
5. Postgraduate Student, Department of Paediatric and Preventive Dentistry, Sharad Pawar Dental College, Datta Meghe Institute of Higher Education and Research, Wardha, Maharashtra, India.

NAME, ADDRESS, E-MAIL ID OF THE CORRESPONDING AUTHOR:
Dr. Devyani Taori,
Postgraduate Student, Department of Paediatric and Preventive Dentistry,
Sharad Pawar Dental College, Sawangi, Wardha-442004, Maharashtra, India.
E-mail: dr.devyani09@gmail.com

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