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Case Report

Extragingival Pyogenic Granuloma of the Hard Palate in an Adolescent: A Case Report

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Abstract

Background: Pyogenic granuloma (PG) is thought to represent an exuberant tissue response to local irritation or trauma. Clinically, this lesion appears as a painless, red-colored tumor that bleeds easily. Rarely, it may be associated with periodontal abscess and bone loss. In the oral cavity, PG lesions are predominantly found on the gingiva, while extra-gingival occurrences are rare. Bone loss. In the oral cavity, PG lesions are predominantly found on the gingiva, while extra-gingival occurrences are rare. Diagnosis and differentiation from other oral pathological lesions can only be achieved through clinical examination and histopathological tissue biopsy. The standard treatment is surgical excision; however, incomplete removal may lead to a risk of recurrence.

Case Presentation: A 15-year-old adolescent male presented with a painless, exophytic lesion on the hard palate that had developed over two months. Clinical and histopathological evaluation confirmed the diagnosis of pyogenic granuloma. Surgical excision was performed under local anesthesia. A26-day postoperative follow-up showed complete healing without recurrence.

Conclusion: This case highlights an unusual presentation of pyogenic granuloma in an extra-gingival site the hard palate in an adolescent. It emphasizes the importance of including PG in the differential diagnosis of palatal lesions and ensuring complete surgical removal to prevent recurrence.

Key Words: Pyogenic Granuloma, Hard Palate, Excisional Biopsy, Adolescent, Case Report, Extra-Gingival lesion

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Introduction

Pyogenic granuloma (PG) is a relatively common, non-malignant lesion representing an exaggerated soft tissue response characterized by vascular proliferation, often resulting from chronic and recurrent tissue injury. It frequently poses a diagnostic challenge, as a variety of pathological processes can present with similar clinical features. Researchers have proposed numerous etiological factors, including inflammation, cysts, trauma, sex hormones, bacteria, viruses, and specific medications (1). Clinically, PG can present with a wide range of appearances, from a sessile lesion to an elevated mass (2). PG is a commonly occurring inflammatory hyperplasia of the skin and oral mucosa. Despite its name, it is not associated with pus; histologically, it resembles an angiomatous lesion rather than a granulomatous one (3). The peak incidence occurs in the third decade of life. PG is more common in females, with a greater predilection for the maxillary gingiva (50.23%) (4). Clinically, these lesions are usually soft, painless, and dark red to purplish-red in color. They may appear as single nodules or multiple papules with a smooth or lobulated surface. As the lesion matures, vascularity decreases, and the surface becomes more fibrous and pink in color (2). The growth of PG is typically slow and may take weeks to months to reach a significant size. These

lesions have been reported to range in size from a few millimeters to several centimeters (5).

The differential diagnosis includes peripheral giant cell granuloma, peripheral ossifying fibroma, and hemangioma. Peripheral giant cell granuloma and peripheral ossifying fibroma occur almost exclusively on the gingiva and can be identified histologically. Hemangioma shows endothelial cell proliferation without the acute inflammatory cell infiltrate that is a common finding in PG (3).

Although numerous treatment options for PG exist—such as the use of Nd:YAG laser, carbon dioxide laser, flash lamp pulsed dye laser, cryosurgery, electrodessication, sodium tetradecyl sulfate sclerotherapy, and intralesional steroids (3)—surgical excision remains the preferred treatment (6). Many studies have reported no recurrence following this treatment method (7); however, some studies have reported recurrence rates of up to 16% after surgery (8).

The novelty of this case lies in its unusual extra-gingival occurrence on the hard palate in an adolescent, contributing to the understanding of rare presentations of PG.

Case Presentation

Patient Information

A 15-year-old male adolescent was referred to the dental clinic of the School of Dentistry at Ahvaz University of Medical Sciences. His chief complaint was a painless swelling on the hard palate that had been gradually increasing in size over the preceding two months. The patient reported that he first noticed the lesion following minor oral trauma to the palatal area, which occurred approximately two months prior to presentation. He described the trauma as accidental biting of the palate while eating, which initially caused transient discomfort but subsequently appeared to trigger the development of the swelling.

The patient's medical history was unremarkable. He was systemically healthy, with no chronic illnesses, no history of immunosuppression, and no known drug allergies. He was not taking any medications at the time of presentation. His dental history revealed fair oral hygiene, with visible plaque accumulation and evidence of untreated dental caries. The patient did not wear any orthodontic appliances and reported no history of mouth breathing, which might have predisposed him to palatal irritation. There was no family history of similar lesions or any inherited conditions associated with oral pathologies.

Clinical Findings

Extraoral examination revealed no abnormalities. There was no facial asymmetry, lymphadenopathy, or palpable cervical lymph nodes. Intraoral examination, however, revealed a well-defined, exophytic lesion located on the hard palate, approximately 1 cm lateral to the midline and extending posteriorly toward the junction of the hard and soft palate (Figure 1). The lesion measured approximately 25 mm in its anteroposterior dimension, 30 mm mediolaterally, and 10 mm in height.

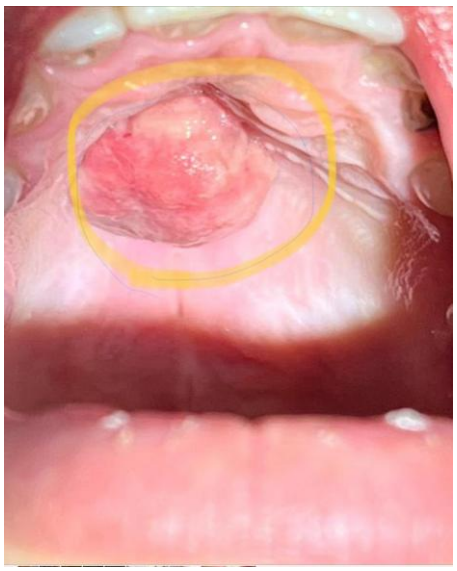

Figure 1. Clinical image shows a soft lesion located in the midline of the hard palate

On palpation, the lesion exhibited a firm, non-fluctuant consistency with no evidence of compressibility. The surface was smooth and intact, with no ulceration or necrosis. The color was generally homogeneous and consistent with the surrounding oral mucosa; however, focal areas of erythema were observed, particularly on the most prominent aspect of the lesion. Diascopy was not performed. The lesion was non-tender to palpation but exhibited a tendency for occasional spontaneous bleeding, which the patient reported occurring during eating or tooth brushing. Despite its size, the lesion did not interfere with speech articulation or

mastication, and the patient reported no dysphagia or respiratory compromise.

A comprehensive examination of the surrounding oral tissues revealed no identifiable local irritating factors. There were no sharp cusps, defective restorations, or orthodontic appliances in contact with the lesion. The adjacent teeth were vital and responded normally to percussion and thermal testing. Periodontal examination revealed no attachment loss or bone loss associated with the lesion.

Timeline

The clinical timeline of this case is summarized as follows:

- **Two months prior to presentation:** The patient experienced accidental oral trauma to the hard palate. Within days, he noticed the initial development of a small, painless swelling at the trauma site. The lesion progressively enlarged over the subsequent weeks.
- **Initial presentation (Day 0):** The patient presented to the dental clinic for evaluation. A comprehensive clinical examination was performed, and differential diagnoses were formulated. Clinical photographs were obtained for documentation.
- **Informed consent and surgical planning (Day 0):** Following the clinical examination, the treatment plan, including excisional biopsy, was discussed with the patient and his guardian. Written informed consent was obtained.
- **Surgical intervention (Day 7):** One week after the initial consultation, the patient returned for surgical excision of the lesion. The procedure was performed under local anesthesia in the outpatient clinic setting.
- **Histopathological diagnosis (Day 14):** The excised specimen was processed and examined microscopically. A definitive diagnosis of PG (lobular capillary hemangioma) was established.
- **Short-term follow-up (Day 33; 26 days post-surgery):** The patient returned for post-operative evaluation. Clinical examination demonstrated complete wound healing with no signs of recurrence.
- **Long-term follow-up (Planned):** To monitor for potential late recurrence, additional follow-up appointments were scheduled at three months and six months post-surgery. The patient was instructed to return immediately if any changes were observed.

Diagnostic Assessment

Clinical Differential Diagnosis:

Based on the clinical presentation—particularly the lesion's location on the hard palate, its smooth surface morphology, sessile base, firm consistency, and the patient's age—a differential diagnosis was formulated. The primary considerations included:

1. **PG (Lobular Capillary Hemangioma):** The most likely diagnosis, given the lesion's vascular appearance, history of preceding trauma, tendency to bleed, and exophytic growth pattern.
2. **Irritation Fibroma:** Considered due to the lesion's firm consistency, smooth surface, and potential association with chronic irritation, although the vascular component and bleeding tendency were less consistent with this entity.
3. **Peripheral Giant Cell Granuloma:** Although typically occurring on the gingiva, this lesion was considered in the differential due to its reactive nature and similar clinical appearance.
4. **Peripheral Ossifying Fibroma:** Also considered, but this lesion occurs almost exclusively on the gingiva and was therefore less likely given the palatal location.
5. **Hemangioma:** A developmental vascular lesion was considered; however, the absence of the lesion since birth and the history of trauma and rapid growth made this diagnosis less probable.
6. **Salivary Gland Neoplasms:** Given the palatal location, minor salivary gland tumors (such as pleomorphic adenoma) were considered; however, the vascular appearance and bleeding tendency were atypical for such neoplasms.

Diagnostic Procedures:

Following informed consent, surgical excision of the lesion was performed under local anesthesia. An excisional biopsy technique was employed to ensure

complete removal of the lesion for both therapeutic and diagnostic purposes. The procedure was performed using a scalpel, and the lesion was excised in its entirety, including a 2-mm margin of clinically normal-appearing tissue. The specimen was immediately placed in 10% neutral buffered formalin and submitted to the oral pathology laboratory for histopathological examination. Hemostasis was achieved with local pressure and application of absorbable gelatin sponge. The surgical site was left to heal by secondary intention, which is the standard approach for palatal wounds due to the lack of significant submucosal tissue for primary closure.

Histopathological Findings:

Microscopic examination of hematoxylin and eosin-stained sections revealed a proliferation of granulation tissue-like vascular channels. At low magnification, a distinct lobular architecture was evident, characterized by aggregates of capillaries organized into lobules separated by fibromyxoid stroma. At higher magnification, the capillaries were lined by plump, proliferating endothelial cells showing no cytological atypia or mitotic activity. The overlying stratified squamous epithelium exhibited acanthosis with areas of superficial ulceration and associated acute inflammatory cell infiltrate. The fibrovascular stroma contained a mixed inflammatory infiltrate, including neutrophils, lymphocytes, and plasma cells. These histopathological features were characteristic and diagnostic of lobular capillary hemangioma, more commonly known as PG (Figure 2).

Immunohistochemical staining was not deemed necessary, as the morphological features were unequivocal and sufficient for a definitive diagnosis.

Therapeutic Intervention

Preoperative Considerations:

The treatment plan was discussed in detail with the patient and his guardian, including the nature of the procedure, potential risks and benefits, and the importance of histopathological examination. Written informed consent was obtained prior to the procedure.

Anesthesia:

Local anesthesia was achieved using 2% lidocaine with 1:100,000 epinephrine (Darupakhsh Co., Tehran, Iran). Infiltration anesthesia was administered in the palatal region adjacent to the lesion. Care was taken to inject slowly and minimize patient discomfort.

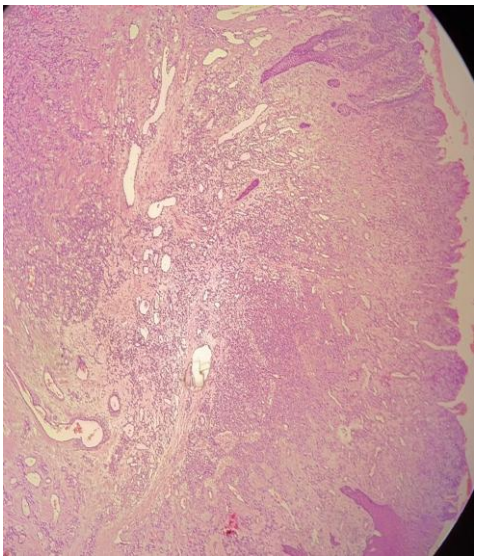

Figure 2. Histopathological stain shows the characteristics of PG

Surgical Procedure:

The lesion was excised using a No. 15 scalpel blade. An elliptical incision was made around the base of the lesion, ensuring inclusion of a 2-mm margin of healthy-appearing tissue. The lesion was carefully dissected from the underlying periosteum, which remained intact. Hemostasis was achieved by applying pressure with gauze soaked in local anesthetic with epinephrine, followed by placement of an absorbable gelatin sponge (Gelfoam® Gelatin Sponge; Pfizer Australia, Mulgrave, Victoria) over the surgical bed. No sutures were placed, allowing the site to heal by secondary intention, which is the preferred method for palatal wounds due to the dense, relatively avascular nature of the palatal mucosa.

Postoperative Care:

The patient was discharged with verbal and written postoperative instructions, which included:

- Avoidance of hot foods and beverages for 24 hours
- Soft diet for one week
- Avoidance of vigorous rinsing or spitting for 24 hours

- Gentle rinsing with 0.12% chlorhexidine mouthwash twice daily starting 24 hours post-surgery
- Over-the-counter analgesics (ibuprofen) as needed for pain management
- Instructions to return immediately if excessive bleeding, severe pain, or signs of infection occurred

Specimen Handling:

The excised specimen was immediately placed in 10% neutral buffered formalin, labeled with the patient's identification details, and accompanied by a completed pathology request form detailing the clinical findings and differential diagnosis. The specimen was transported to the oral pathology laboratory for processing and examination.

Follow-up and Outcomes

Short-term Follow-up (26 days post-surgery): The patient returned for scheduled follow-up evaluation 26 days following the surgical procedure. Clinical examination revealed complete re-epithelialization of the surgical site with healthy, pink mucosa (Figure 3). There was no evidence of residual lesion, recurrence, or complication such as infection or excessive scar formation. The patient reported no pain or discomfort and had returned to normal dietary habits without difficulty. He confirmed adherence to the postoperative instructions, including the use of chlorhexidine mouthwash during the initial healing phase.

Long-term Follow-up (Planned):

To ensure comprehensive monitoring for potential late recurrence, which has been reported in up to 16% of cases following surgical excision, the patient was scheduled for additional follow-up appointments at three months and six months post-surgery. At these visits, clinical examination will be performed to assess for any signs of regrowth or new lesion development. The patient and his guardian were educated about the importance of long-term surveillance and instructed to return immediately if any changes were noticed, rather than waiting for the scheduled appointments.

Patient Perspective:

The patient expressed satisfaction with the treatment outcome, noting resolution of the occasional bleeding he had experienced prior to surgery. He reported no functional impairments or aesthetic concerns following the procedure. His guardian was appreciative of the thorough explanation provided throughout the diagnostic and therapeutic process.

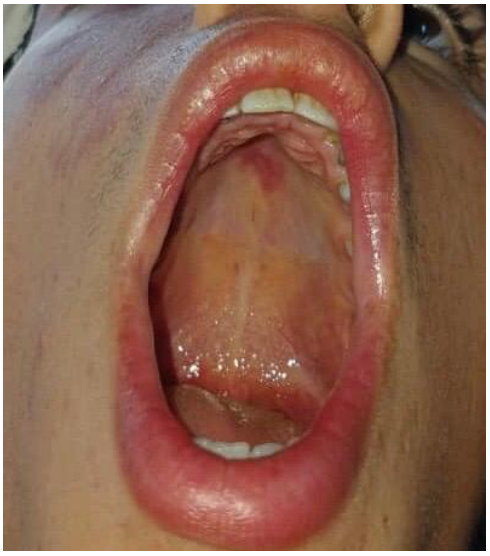

Figure 3. Clinical image 26 days after surgery

Adherence and Tolerance:

The patient tolerated the procedure well with no intraoperative or postoperative complications. He demonstrated good adherence to the follow-up schedule and postoperative instructions, contributing to the favorable outcome observed at the short-term follow-up visit

Discussion

PGs commonly occur on the gingiva and are uncommonly seen extra-gingivally in frequently damaged areas such as the lower lip, tongue, and palate (9). In the current study, the lesion was symmetrically located along the midline of the hard palate, extending from the posterior region to the vicinity of the upper six teeth on both sides. These findings align with the results of Abdulkarim Hussain Alwan et al., who noted that PGs are more prevalent in the maxilla than in the mandible (10). Research indicates that these lesions typically appear during the second decade of life, particularly in adolescents, with an occurrence rate of approximately 23% (11), which corresponds with the age of the patient in this study (15 years). It is possible that hormonal changes during puberty play a significant role in the development of such lesions. The color of the lesion

in the oral cavity depends on its duration. Young PGs have more blood vessels and hyperplastic granular tissue, making them redder, while older PGs have more collagen and are pink in color (12). In this study, the lesion exhibited a color similar to the adjacent mucosa due to its growth duration (two months), with some areas appearing pinker.

Parajuli Ramesh et al. (13) reported two cases of PG. The first case involved a 26-year-old female who presented with a complaint of painless and progressive swelling on the dorsum of the tongue for one year. On examination, there was a single, pale to pinkish exophytic growth measuring 2.5 × 2 cm, arising from the dorsum of the anterior tongue with a pedunculated base. It was soft, non-tender, with a smooth surface that did not bleed on touch (13). Although this case was similar to the lesion reported in our study in terms of growth pattern, color, size, and surface characteristics, the location of the lesion and the age of onset differed. The second case reported by Parajuli Ramesh et al. involved a 15-year-old girl with a complaint of painless and progressive swelling arising from the upper lip for four months. The lesion bled occasionally, especially when touched. She denied any history of trauma to the upper lip. On examination, there was a single pinkish mass with a sessile base, measuring 0.5 × 0.5 cm, arising from the upper lip. It was mildly tender with minimal bleeding on palpation (13). This case differed from ours in terms of size, location, and the presence of tenderness. Gomes, Sheiba, et al. (3) reported a 22-year-old male complaining of a swelling in the upper right jaw region, which caused discomfort while eating. The patient reported that he noticed the swelling two years prior, which was painless and gradually increased in size. Intraoral examination revealed a large, sessile, lobulated gingival overgrowth with a smooth surface, reddish-pink in color with white patches, measuring approximately 21 mm × 44 mm (3). This case differed from the case presented in our study in terms of age of occurrence, size, and location. Anuradha Ganesan et al. (14) reported a 49-year-old female patient with the chief complaint of a growth on the gums in the upper left back tooth region for seven months. There was no pain until one month prior to presentation, but as the growth increased in size, the patient reported pain upon mastication. Intraoral examination revealed a well-defined gingival growth in the edentulous region. The lesion was reddish-pink in color, approximately 4 cm × 3 cm in size, non-tender and firm on palpation, with an irregular and nodular surface exhibiting indentation marks due to impingement by the opposing lower teeth. There was severe bleeding from the site (14). This case also differed from the case reported by us in terms of age, location, surface characteristics, duration of development, and presence of bleeding.

Some risk factors for PG occurrence include dental caries, poor oral hygiene, and multiple infections such as *Staphylococcus aureus* infection, cysts, abscesses, inflammation, and trauma (15, 16). In the current patient, we could not identify any specific source of chronic trauma or irritation. However, the patient's poor oral hygiene and severe dental caries may be exacerbating factors.

The differential diagnosis for PG includes peripheral giant cell granuloma, peripheral ossifying fibroma, metastatic cancer, hemangioma, pregnancy tumor, hyperplastic gingival inflammation, and Kaposi's sarcoma. Peripheral giant cell granuloma is clinically similar to PG, but the appearance of multinucleated giant cells is a differentiating feature. Fibroma can be distinguished by its consistency, texture, and lighter color. In metastatic tumors, the microscopic appearance resembles that of the tumor of origin. Hemangioma is a developmental disorder and is most commonly seen on the tongue. It can be multinodular, bluish-red, and can be diagnosed by a chairside procedure called diascopy. Kaposi's sarcoma can be differentiated histopathologically and is also associated with AIDS. Pregnancy tumor occurs towards the end of pregnancy, and the tendency for this lesion to shrink after delivery indicates a definite role of hormonal factors in its etiology (14).

The treatment of PG depends on the size and location of the lesion. Effective treatment requires removing all etiological factors and performing complete surgical excision to reduce the risk of recurrence. Other treatment modalities include laser therapy, sclerotherapy, electrolysis, curettage, and a combination of different techniques (17). In this study, a surgical-based treatment approach was employed. The surgical procedure consisted of an excisional biopsy performed under local anesthesia.

Generally, recurrence occurs at intervals of 10 months to one year, with a reported incidence rate of

approximately 16% (8, 18). However, no recurrence was observed in our patient during the short-term follow-up (26 days post-surgery). Additional follow-up appointments were planned at three and six months to monitor for possible late recurrence. Recurrence is associated with several factors, with poor oral and dental hygiene being the most important (18). Preventive strategies include maintaining good oral hygiene, professional dental scaling, and using soft toothbrushes, all of which are helpful in preventing PG recurrence.

It is important to acknowledge the inherent limitations of the case report format when considering the implications of this study for clinical practice. As a research design, case reports are descriptive in nature and, by definition, represent a single observation. Consequently, they cannot establish causality, quantify risk, or assess treatment efficacy with the statistical power of analytical studies such as cohort or randomized controlled trials. The findings presented here, while contributing valuable observations on an unusual clinical presentation, are not generalizable to the broader population. The absence of recurrence in this single case, for example, does not provide robust evidence for the long-term success of the treatment modality employed. Furthermore, case reports are susceptible to publication bias, as unusual or positive outcomes are more likely to be reported than common or negative results. Despite these methodological shortcomings, case reports remain an essential component of the medical literature. They serve to generate hypotheses, document rare phenomena, highlight diagnostic challenges, and contribute to the collective knowledge base, particularly for infrequently encountered conditions such as extra-gingival PG in an adolescent. Although PG is a common soft tissue lesion in the oral cavity, it can present with unusual clinical features. This report emphasizes the importance of correctly diagnosing this lesion and identifying the main etiological factors. Extra-gingival presentations may reveal multiple causes and risk factors that differ from those associated with gingival PG. Dentists should also be aware of the appearance of such lesions in unusual locations and should adopt an interdisciplinary strategy that includes accurate diagnosis, personalized treatment planning, and patient education.

Conclusion

This case reports an unusual presentation of PG on the hard palate, an extra-gingival site, in a 15-year-old male. Although PG is a common oral reactive lesion, its occurrence outside the gingiva can pose a diagnostic challenge. This case highlights the importance of including PG in the differential diagnosis of palatal lesions in adolescents. Complete surgical excision with histopathological confirmation remains the standard of care, ensuring accurate diagnosis and preventing recurrence. Short-term follow-up demonstrated complete healing, though long-term monitoring is warranted. This report contributes to the literature by documenting a rare anatomical presentation and reinforcing clinical vigilance for soft tissue lesions in atypical locations.

Declarations

Ethics Approval and Consent to Participate

This case report was conducted in accordance with the ethical standards of the institutional research committee and with the 1964 Helsinki Declaration and its later amendments. Written informed consent was obtained from the patient and his legal guardian for participation in this study.

Competing Interests

The authors declare that they have no competing interests relevant to this case report.

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Data Availability

The data supporting this case report are included within the article. Further inquiries can be directed to the corresponding author.

Authors' Contributions

- **Fatemeh Babadi:** Contributed to the conception and design of the work, clinical examination, histopathological interpretation, and critical revision of the manuscript for important intellectual content.
- **Kiumars Keyvan:** Contributed to data acquisition, literature review, patient follow-up assessments, and drafting of the initial manuscript.
- **Kosar Rezaeifar:** Contributed to the conception and design of the work, surgical

management, manuscript preparation, and final approval of the version to be published. Served as the corresponding author and supervised all aspects of the work.

All authors read and approved the final manuscript and agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

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