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Post extraction pyogenic granuloma: A Case Report and Literature Review

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Abstract:

Pyogenic granuloma (PG) is a benign vascular lesion that typically appears as a tumor-like growth in the oral cavity, often resulting from an inflammatory response to minor trauma or irritation. It is characterized by rapid growth, a propensity to bleed, and is commonly found on the gingiva, tongue, and other oral tissues. It is characterized by its reactive nature rather than being a true neoplasm. Clinically, PG presents as a soft, rapidly growing mass that is has tendency to bleeding and can vary in size from a few millimeters to several centimeters. The condition is often associated with local irritation or trauma, hormonal changes, and can occur in various locations within the oral cavity, including extraction sockets, although this is rare. A literature review also indicates that pyogenic granulomas are primarily found in the gingiva but can develop in extraction sockets, especially after trauma or irritation. The pathogenesis of pyogenic granuloma is not entirely understood, but it is believed to be a reactive process to local irritants or trauma. The condition is more prevalent in females and often occurs in individuals in their third and fourth decades of life. The standard treatment involves surgical excision, which is usually curative, although laser therapy is emerging as an alternative method for removal.
This report discusses the case of pyogenic granuloma in a 38-year-old breast feeding mother in extraction site in lower left back tooth region. And discusses diagnostic challenges and treatment options.

Keywords: Pyogenic granuloma, post extraction socket, benign neoplasm. Pyogenic granuloma, post-extraction lesion, lobular capillary hemangioma, reactive oral lesion, oral surgery.

الورم الحبيبي القيحي بعد الخلع: تقرير حالة ومراجعة أدبية

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الملخص

الورم الحبيبي القيحي (PG) هو آفة وعائية حميدة تظهر عادةً كنمو يشبه الورم في تجويف الفم، وغالبًا ما ينتج عن استجابة التهابية لصدمة أو تهيج طفيف. يتميز هذا الورم بسرعة نموه، وميله للنزيف، ويوجد عادةً على اللثة واللسان وأنسجة الفم الأخرى. يتميز بطبيعته التفاعلية بدلاً من كونه ورمًا حقيقيًا. سريريًا، يظهر الورم الحبيبي القيحي ككتلة ناعمة سريعة النمو تميل إلى النزيف، ويمكن أن يتراوح حجمها من بضع مليمترات إلى عدة سنتيمترات. غالبًا ما ترتبط الحالة بتهيج أو صدمة موضعية، وتغيرات هرمونية، ويمكن أن تحدث في مواقع مختلفة داخل تجويف الفم، بما في ذلك تجاويف خلع الأسنان، على الرغم من ندرة حدوث ذلك. تشير مراجعة الأدبيات أيضًا إلى أن الأورام الحبيبية القيحي توجد بشكل أساسي في اللثة، ولكنها يمكن أن تتطور في تجاويف خلع الأسنان، وخاصة بعد الصدمة أو التهيج. لم تُفهم آلية الورم الحبيبي القيحي بشكل كامل، ولكن يُعتقد أنه عملية تفاعلية مع مُهيجات أو صدمات موضعية. يُعد هذا المرض أكثر شيوعًا لدى الإناث، وغالبًا ما يُصيب الأفراد في العقدين الثالث والرابع من العمر. يشمل العلاج القياسي الاستئصال الجراحي، وهو عادةً ما يكون علاجيًا، على الرغم من ظهور العلاج بالليزر كطريقة بديلة للإزالة.
يناقش هذا التقرير حالة ورم حبيبي قيحي لدى أم مُرضعة تبلغ من العمر 38 عامًا في موقع خلع السن في منطقة أسفل الفك الايسر. ويناقش أيضًا التحديات التشخيصية وخيارات العلاج.

الكلمات المفتاحية: الورم الحبيبي القيحي، تجويف ما بعد الخلع، ورم حميد. الورم الحبيبي القيحي، آفة ما بعد الخلع، ورم وعائي دموي فصيصي، آفة فموية تفاعلية، جراحة الفم.

Introduction

Pyogenic granuloma is a benign vascular lesion commonly arising in the oral cavity as a response to local irritation or trauma. Post-extraction cases are rare and often misdiagnosed due to their aggressive appearance. Pyogenic granuloma (PG), is a common reactive lesion seen in the oral cavity [1]. Although its name suggests an infectious etiology, PG is a hyperplastic response to local irritation including foreign materials left in the extraction socket, such as bone spicules or food particles [2]**,** trauma, hormonal fluctuations, or poor oral hygiene [3]. They are composed of hyperplastic granulation tissue with a rich vascular supply, which gives them their characteristic appearance [1]. It most frequently occurs on the gingiva but can also affect the lips, tongue, buccal mucosa, and rarely, extraction sockets [4].

Case Presentation

A 38-year-old breast feeding mother presented with a painless gingival swelling in the extraction socket of left lower third molar, which had been growing for two weeks. Clinical examination revealed an oval-shaped, erythematous sessile, lesion occupying the extraction socket measuring 0.7 cm × 0.5. It was soft, compressible, and bleed on slight manipulation as shown in figure (1). No regional lymphadenopathy was observed. Periapical radiograph of the area showed normal post-extraction bone healing, with no residual root fragments or bony lesions.

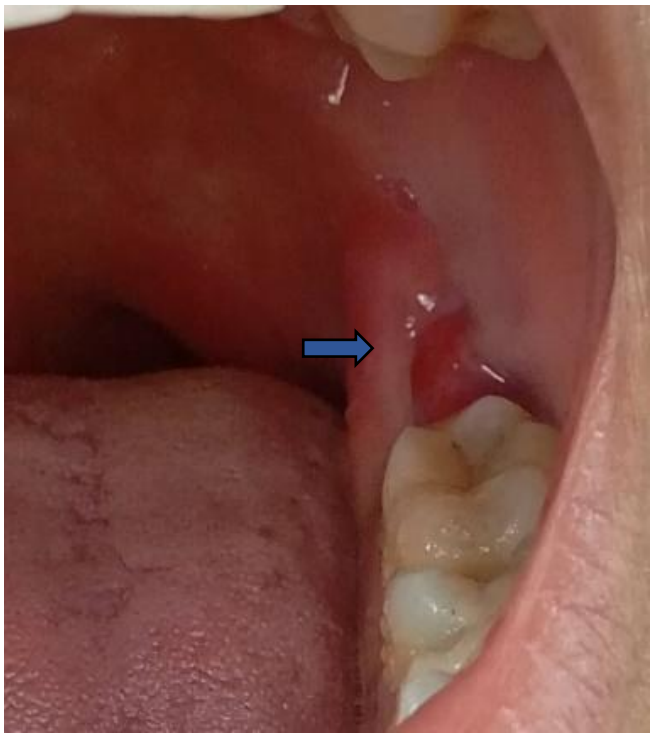

Figure 1. Clinical appearance of the lesion

After excision, histopathological analysis revealed lobular capillary proliferation with granulation tissue and inflammatory cells. The surface epithelium covered with a fibrinopurulent membrane—consistent with pyogenic granuloma as shown in figure 2.

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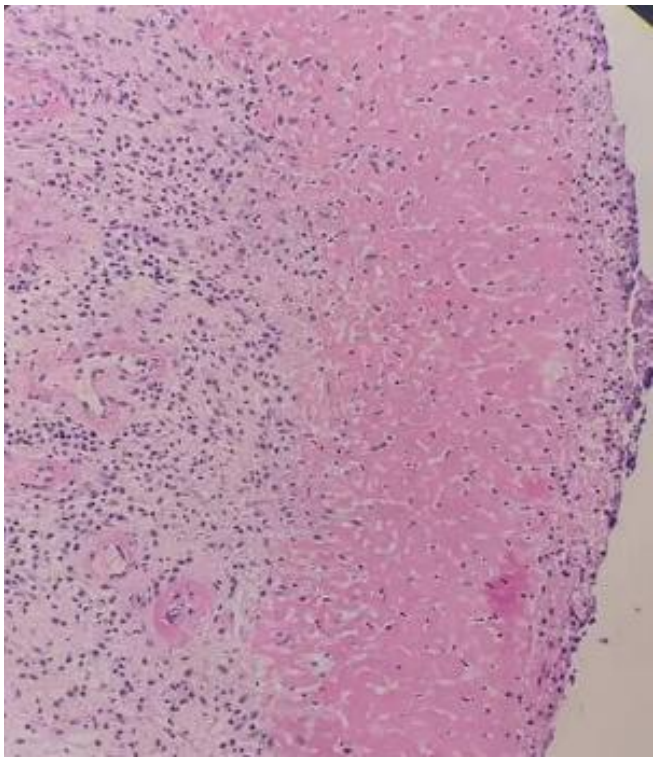

Figure 2. H & E stain

Therapeutic Intervention

The lesion was completely excised under local anesthesia, and the socket was thoroughly curetted. Hemostasis was achieved, and postoperative instructions were provided. The patient was advised on maintaining proper oral hygiene and avoiding trauma at the site. At the 1-week follow-up, the site showed satisfactory healing without signs of infection or bleeding. At 3 months, complete healing was observed with no recurrence.

Discussion

Although PG is a common lesion, its occurrence in an extraction socket is rare. The lesion typically arises due to excessive granulation tissue formation, often exacerbated by poor healing, trauma, or residual irritants [5].

Histologically, PGs show lobular aggregates of capillaries within a granulation tissue matrix, explaining the lesion's vascular and friable nature. Complete excision along with removal of local irritants is essential to prevent recurrence, which occurs in up to 16% of cases if incompletely treated [6].

Post-extraction pyogenic granuloma, though uncommon, should be considered in the differential diagnosis of rapidly growing intraoral lesions at healing sites [7].

A multidisciplinary approach involving clinical, radiographic, and histopathologic evaluation is key to accurate diagnosis and successful treatment [8].

Pyogenic granulomas are often linked to factors such as hormonal changes (especially during pregnancy), local irritation, and trauma. The standard treatment is surgical excision, which typically results in a low recurrence rate when performed correctly [9]. It is crucial to address any underlying irritants, such as poor oral hygiene or dental calculus, to minimize the chances of recurrence [10].

The development of pyogenic granuloma, during pregnancy and breast-feeding period is closely linked to hormonal changes [11]. Estrogen and progesterone promote angiogenesis and inhibit apoptosis of granuloma cells, facilitating lesion growth [12]. These effects may be counteracted by androgens, which inhibits angiogenic activity. Progesterone also acts as an immunosuppressant limiting acute inflammatory responses but enhances chronic inflammation, leading to a more pronounced inflammatory appearance of the lesion [12].

Pregnancy tumors regress after childbirth due to a significant drop in angiogenic factors such as vascular endothelial growth factor (VEGF) [13]. VEGF levels are typically high during pregnancy but decrease sharply postpartum. This allows Angiopoietin-2 (Ang-2) to promote regression of blood vessels in the absence of VEGF, contributing to lesion resolution [13].

In this case, however, prolactin, a hormone that remains high during lactation, supports ongoing inflammation and angiogenesis by stimulating leukocytes and epithelial cells to release pro-angiogenic factors. Additionally, continuous local irritation from adjacent teeth may have further contributed to the lesion's development.

In the context of tooth extraction, PG may arise due to irritation: Residual irritants in the socket can provoke a reactive hyperplastic response, leading to the formation of PG [14]. Delayed Healing: Factors such as poor oral hygiene, systemic diseases, or medications can impair healing and contribute to the development of PG [15].
Diagnosing pyogenic granuloma typically involves a clinical examination and may require a biopsy to confirm the diagnosis. The histological examination reveals a highly vascularized granulation tissue, often with a mixed inflammatory infiltrate [16].
The gold standard for managing PG is complete surgical removal of the lesion along with any underlying irritants. This approach minimizes the risk of recurrence.

Conclusion

Pyogenic granuloma may develop post-extraction due to retained irritants or healing complications. perfect diagnosis and complete surgical management are essential to prevent recurrence**.** Case reports illustrate the variability in presentation and the effectiveness of surgical intervention. Continuous monitoring and proper oral hygiene practices are essential for preventing recurrence after treatment.

Patient Consent
Written informed consent was obtained from the patient for publication of this case report and accompanying images**.**

Conflict of Interest
The authors declare no conflict of interest.

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