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Solitary Plasmacytoma Mimicking Periapical Lesion in Maxillary Teeth: A Case Report

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Abstract

This article reports a rare case of solitary bone plasmacytoma in the maxilla of a 76-year-old female patient diagnosed at an early stage. The lesion initially mimicked an endodontic infection with a sinus tract associated with teeth #22 and #23. Despite conventional endodontic treatment, no clinical improvement was observed. The patient was referred for biopsy, and histopathological analysis revealed a proliferation of plasmacytoid cells with atypia and intense leukocytic infiltrate. Immunohistochemistry confirmed monoclonality compatible with plasmacytoma. Further systemic investigation excluded multiple myeloma, leading to the final diagnosis of solitary plasmacytoma. The patient underwent 20 radiotherapy sessions totaling 40 Gy and remains clinically stable under multidisciplinary follow-up. This case highlights the importance of considering non-endodontic pathologies in persistent periapical lesions. Early recognition of plasmacytoma is crucial, as it may represent an initial manifestation of multiple myeloma, emphasizing the endodontist's role in accurate diagnosis and timely referral.

Keywords: Apical Periodontitis; Endodontics; Jaw; Neoplasm; Plasmacytoma

Introduction

Plasmacytoma, also known as solitary plasmacytoma (SP) is an extremely rare neoplasm with a cumulative incidence of 0.15/100.000 [1]. It affects B-lymphocytic plasma cells with no systemic dissemination and is of unknown origin [2]. Solitary plasmacytoma may be an isolated disease or the first manifestation of subsequent multiple myeloma [3].

The most frequent clinical manifestations are recurrent infections, fever, fatigue, hematological changes, nephropathy, and temporal arteritis [4, 5]. The preferred location of solitary plasmacytoma is the spine, followed by the sacrum, iliac bone, femur, sternum, jaws, and skull [3]. The manifestation in the maxillofacial region is quite varied and can radiographically mimic endodontic lesions [6-9], including those associated with the tooth apex [10].

The diagnosis is established by histopathological investigation, immunohistochemical (IHC) examination of the osteolytic bone area associated with clinical and radiographic data [4]. The treatment of choice is usually surgical resection, radiotherapy, or a combination of both [3]. It is believed that 50% to 70% of the affected patients will develop multiple myeloma within ten years [11]. Thus, long-term follow-up is required [12]. Dentistry performs an important role in multidisciplinary care, including diagnosis, management and monitoring of the oral cavity in search of suspicious lesions. This case report describes a solitary plasmacytoma mimicking a periapical lesion associated with a sinus tract.

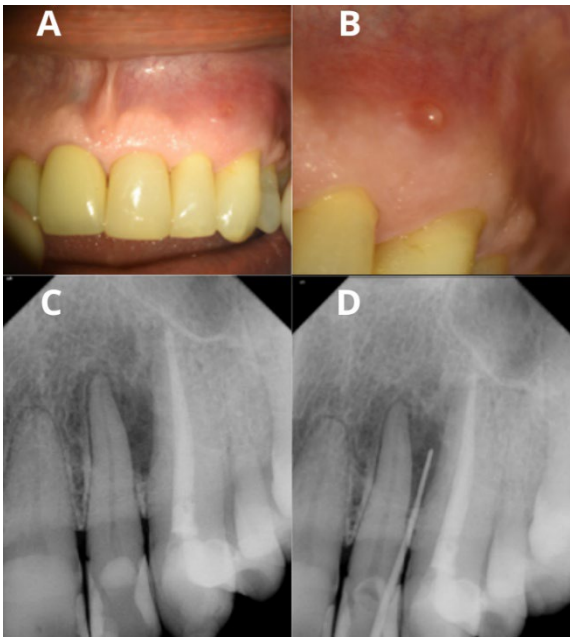

Figure 1. *A*) Patient at initial consultation; *B*) Sinus tract located between teeth #22 and #23; *C*) Initial diagnostic radiograph; *D*) Sinus tract identified by gutta-percha

Case Report

The case report was approved by the institutional Research Ethics Committee (CAAE 37246320.6.0000.9907) and conducted in compliance with the ethical principles of the Declaration of Helsinki. A 76-year-old Caucasian female patient sought urgent endodontic care in May 2022 due to discomfort in the region of the left ala of the nose, between teeth #22 and #23. She reported that the discomfort had begun two weeks earlier, followed by a mild swelling and the formation of a sinus tract. Her medical history included hypertension, hypothyroidism, pre-diabetes, and myelodysplasia, with complaints of fatigue and shortness of breath.

Extraoral examination revealed no visible abnormalities, but tenderness was noted on palpation near the upper lip. Intraoral examination showed extensive composite restorations on teeth #22 and #23, sensitivity to vertical percussion and palpation, and a sinus tract between both teeth (Fig. 1). Thermal pulp tests were negative, and periapical radiography revealed a diffuse radiolucent area (Figs. 1C & 1D). Different views of cone-beam computed tomography (CBCT) (Fig. 2) showed a hypodense lesion centered on tooth #22, extending between the roots of #22 and #23, measuring 9.88 × 10.2 × 13.5 mm, compatible with a chronic periapical abscess (Figs. 2D & 2F).

Conventional endodontic treatment was performed on tooth #22, followed by retreatment of #23. Despite adequate procedures, the sinus tract persisted. Given the atypical presentation and absence of improvement, a biopsy was performed, and the entire lesion was

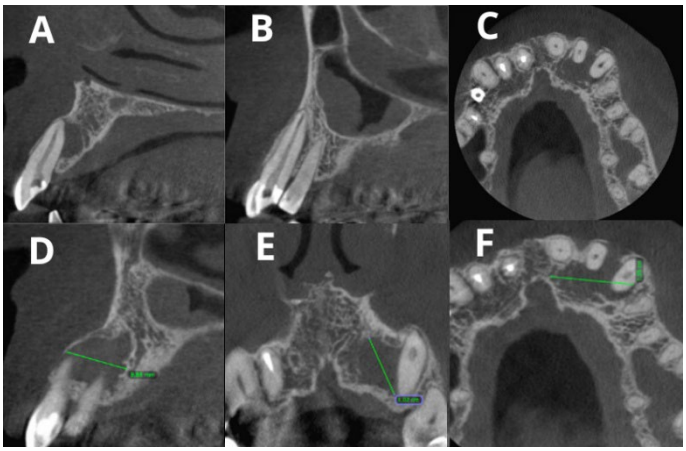

Figure 2. *A*) Parasagittal section of #22 on high-resolution CBCT; *B*) Parasagittal section of tooth #23 retreated; *C*) Axial section of the maxilla; *D*) Buccopalatal measurement on sagittal view; *E*) craniocaudal measurement on coronal view; *F*) Mesiolateral measurement on axial view

excised. Microscopically, the sample consisted mainly of lymphocytes, plasmocytes, and macrophages without atypia (Figs. 3A & 3B). Immunohistochemistry revealed positivity for CD138 and lambda (Figs. 3C & 3D), negative kappa expression, and a low Ki-67 index of 3% (Figs. 3E & 3F), confirming the diagnosis of plasmacytoma.

The patient was referred to an oncologist for systemic evaluation. Blood tests and imaging, including positron emission tomography–computed tomography (PET-CT) and bone scans, showed no additional lesions or systemic alterations. The final diagnosis was solitary plasmacytoma of the maxilla, a non-odontogenic neoplasm mimicking an endodontic infection.

Endodontic treatment of teeth #22 and #23 was completed after biopsy and regression of the sinus tract. Both canals were obturated with gutta-percha and sealed with glass ionomer, followed by composite restoration. Radiotherapy was initiated with a planned dose of 40 Gy, delivered in 20 fractions of 2 Gy each, targeting a lytic lesion in the left maxilla between teeth #22 and #23, using intensity-modulated radiation therapy (IMRT) with an intraoral stent for positioning. The patient completed treatment with only mild grade I mucositis, managed with prophylactic laser therapy.

At 105 days post-radiotherapy, the patient remained in good general condition, with mild tenderness but no swelling. After 6 months, follow-up CBCT revealed a slightly oval hypodense area with hyperdense foci suggestive of bone repair (Fig. 4). Partial cortical discontinuity persisted, but clinical evaluation showed stable teeth, intact mucosa, and slight asymmetry of the upper lip.

The patient remains stable under quarterly follow-up. This case underscores the importance of considering non-odontogenic pathologies when periapical lesions do not respond to standard endodontic therapy. Early biopsy and multidisciplinary management are essential for accurate diagnosis and favorable outcomes.

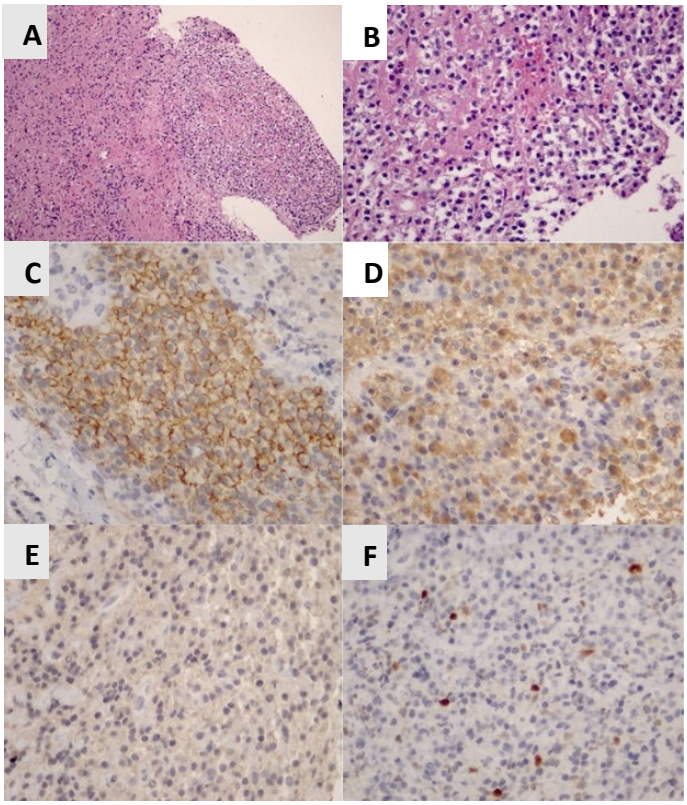

Figure 3. Histopathological characteristics of plasmacytoma; *A & B)* The presence of lymphocytes and plasma cells is observed amidst dense fibrous connective tissue, magnification of 10× and 40× respectively (hematoxylin and eosin staining); *C)* The cells are immunopositive for the CD138 antibody (40×, immunohistochemical (IHC) staining); *D)* The cells are immunopositive for lambda, (40×, IHC staining); *E*) Absence of immunoreaction for the Kappa antibody (40×, IHC staining); *F*) Low expression of the Ki-67 antibody (3%) (40×, IHC staining)

Discussion

Solitary plasmacytoma (SP) involving the jaws is uncommon, and its presentation in the anterior maxilla is particularly rare. Several studies have reported cases that mimicked endodontic lesions [6, 9, 10]. However, to date, only this case has reproduced the complete clinical profile of a chronic periapical abscess with the presence of a sinus tract. This unusual combination of findings made the initial diagnosis particularly complex, as both clinical and radiographic features were fully consistent with apical periodontitis.

Solitary plasmacytoma is a rare condition that affects B lymphocytic plasma cells without systemic dissemination at diagnosis [2]. It typically occurs in white individuals aged between 50 and 80 years and is more prevalent in men [13]. Solitary plasmacytoma presents as a solitary bone lesion and may affect the mandible in approximately 4.4% of cases [14], particularly in regions of greater hematopoietic activity, such as

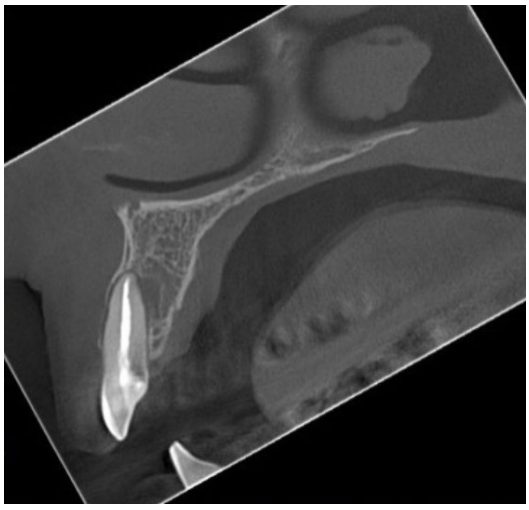

Figure 4. 6-month follow-up CBCT image showing a periradicular lesion under repair

in the molar region, ramus, and angle [15]. Although jaw involvement is uncommon overall, this case is notable because it occurred in a female patient and clinically simulated an exclusively odontogenic inflammatory condition [16]. In contrast to more typical presentations, the lesion was centered at the apex of non-vital teeth, lacked facial swelling or paresthesia, and exhibited a sinus tract strongly suggestive of chronic endodontic infection.

The etiology of plasmacytoma remains unclear. Age, viral infection, chronic stimulation, high irradiation dose, and genetic interactions in the reticuloendothelial system have been proposed as contributing factors [4]. Solitary plasmacytomas account for less than 5% of plasma cell dyscrasias and are subclassified as solitary osseous or extramedullary plasmacytomas depending on the site involved [17]. Patients typically report minimal but persistent pain [4], and systemic manifestations such as fatigue and fever may occur [18]. In this case, fatigue and mild discomfort were reported but were nonspecific and insufficient to raise suspicion of a plasma cell neoplasm at the time of dental evaluation.

The diagnostic complexity was primarily related to the high concordance between clinical examination and imaging findings. The patient exhibited negative pulp sensibility tests, tenderness to vertical percussion, and a well-defined radiolucent lesion centered at the apices of teeth #22 and #23, features classically associated with inflammatory periapical disease. The sinus tract further reinforced the impression of a chronic apical abscess. By contrast, SP affecting the jaws often presents with facial swelling, tooth mobility, paresthesia [19] or radiolucencies not directly associated with pulp necrosis. Teeth migration has also been described [13, 18], but was absent in this patient. Although osteolytic lesions may appear as radiolucencies superimposed on root apices [20], the intimate relationship with

previously restored and non-vital teeth significantly reduced suspicion of a non-odontogenic process.

Radiographically, SP is characterized by osteolytic lesions with poorly defined margins that may be unilocular or multilocular and sometimes display a "soap bubble" appearance [10]. In the maxillofacial region, radiographic manifestations are heterogeneous and may resemble inflammatory lesions [8]. In the present case, CBCT revealed a hypodense lesion involving the apices of teeth #22 and #23, without extensive cortical destruction or soft tissue involvement. These imaging characteristics supported the initial endodontic diagnosis and demonstrated how conventional diagnostic reasoning may delay recognition of rare entities.

A decisive moment occurred when the sinus tract persisted despite technically adequate endodontic therapy. Inflammatory periapical lesions typically show progressive resolution following proper canal disinfection. Therefore, failure to achieve healing should prompt diagnostic reassessment. Previous reports emphasize that persistent or progressive lesions, especially those associated with bone destruction and lack of response to treatment, require careful evaluation and may justify biopsy [21]. In this case, it was the lesion's biological behavior over time, rather than its initial appearance, that ultimately led to definitive diagnosis.

Solitary plasmacytoma is characterized by nonspecific symptoms, which makes the clinical diagnosis challenging [16]. Diagnosis of SP requires careful evaluation, including complete blood count, urine analysis for Bence Jones protein, serum protein electrophoresis, bone marrow biopsy, and imaging tests such as panoramic/periapical x-rays, magnetic resonance imaging (MRI), and PET-CT [4]. The investigation must also include histopathological and IHC examinations for diagnostic confirmation. Morphologically, plasmacytomas are usually characterized by mature plasma cells, but can also be composed of young and immature cells [22]. The immunophenotype of plasma cells can be assessed by the expression of CD138, CD38, CD79a, and MUM1. In addition, the monoclonality of the light chains, kappa or lambda, by the neoplastic cells is required, which is useful for distinguishing plasmacytomas from infiltrations rich in plasmacytes [23]. In the present case, the cells had the morphology of lymphocytes, mature and immature plasmacytes, associated with the immuno-expression of CD138 (+), lambda (+), and kappa (-), confirming the plasmacytic and monoclonal origin. It was also possible to observe a low proliferation index, estimated at 3%. A low proliferation index can occur in plasmacytoma/multiple myeloma and may be associated with prognosis [24, 25].

Solitary plasmacytoma can represent the initial manifestation of multiple myeloma, a systemic and potentially fatal disease. The risk of progression highlights the importance of early recognition and multidisciplinary follow-up. Surgical excision or radiotherapy remains the treatment of choice, achieving local control in more than 80–90% of cases [26]. The role of adjuvant chemotherapy remains controversial, with no consistent evidence supporting its effectiveness in preventing progression to multiple myeloma [27]. Radiotherapy is the most commonly used treatment and is recommended by the National Comprehensive Cancer Network [11]. In this case, lesion enucleation was followed by radiotherapy. Although no definitive guidelines exist regarding radiotherapy dosage [26], a total dose of 40 Gy was administered within the recommended curative range [28].

From an endodontic perspective, this case provides relevant clinical insights. Radiolucent periapical lesions should not be automatically attributed to pulpal infection, even when pulp testing suggests necrosis. Systemic history must be critically interpreted, particularly in elderly patients or individuals with hematologic disorders. Most importantly, failure of appropriate endodontic therapy should prompt histopathological investigation rather than repeated intervention. Furthermore, progression to multiple myeloma remains a significant prognostic concern in solitary plasmacytomas [29].

Although limited to a single case, this report demonstrates how plasma cell neoplasms may closely resemble routine endodontic conditions. Recognition depends not only on initial clinical findings but also on careful monitoring of lesion evolution and response to treatment.

Conclusion

Solitary plasmacytoma is a rare neoplasm that mainly affects older individuals presented with a solitary bone lesion. In some cases, this presentation can mimic endodontic lesions, so endodontists are likely to encounter cases of this pathology during their professional lives. It is imperative to be familiar with this entity; knowledge is necessary, given its evolution in most cases to multiple myeloma, a disease with a poor prognosis.

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Conflict of interest
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Authors' contributions

Conceptualization: CC/WRS; Methodology: TMM/LFG; Formal Analysis and Investigation: WRS/RM; Writing-Original Draft Preparation: KR; Writing-Review and Editing: CC/WRS/TMM/LFG/RM/MFA/KR; Supervision: KR. All authors read and approved the final manuscript.

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