



Presentation of clinical cases

Interdisciplinary approach to a confluent periapical lesion involving the maxillary sinus: A case report

Abordaje interdisciplinario de lesión periapical confluyente que involucraba el seno maxilar: reporte de un caso

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ABSTRACT

Interdisciplinarity in the diagnosis and treatment of large periapical lesions in the jaws is essential for a favorable prognosis and preservation of dental organs. This case presents apical granulomas as a consequence of chronic endo-periodontal diseases and inadequate and untimely diagnoses. This is how tools such as cone-Bean tomography, histopathology and immunohistochemistry were also applied, playing a fundamental role in their intervention for an accurate diagnosis. The objective of this case was to describe an interdisciplinary approach to a confluent periapical lesion involving the maxillary sinus, which evolved satisfactorily.

Keywords: : Granuloma; Periapical Lesion; Maxillary sinusitis; Fistula; Apicoectomy.

RESUMEN

La interdisciplinaria en los diagnósticos y tratamientos de lesiones periapicales de gran tamaño en los maxilares es fundamental para el pronóstico favorable y conservación de órganos dentales. El presente caso exhibe a los granu-

lomas apicales a consecuencia de enfermedades endo-periodontales crónicas y de inadecuados manejo e inoportunos diagnósticos. Es así como también fueron aplicadas herramientas como tomografía cone-Beam, histopatología e inmunohistoquímica jugando un rol fundamental en la intervención de las mismas para un diagnóstico certero. El objetivo del presente caso fue describir un abordaje interdisciplinario de lesión periapical confluyente que involucraba el seno maxilar, el cual evolucionó de manera satisfactoria.

Palabras clave: Granuloma; lesión periapical; sinusitis maxilar; fistula; apicectomía.

INTRODUCTION

Within the maxillofacial pathologies that usually affect the human being, periapical lesions (PAL) stand out, more frequently they tend to be; apical periodontitis (AP), periapical granuloma (GP), periapical abscess (PA) and periapical cysts (PQ)¹. The anatomical site frequently involved is the maxillary anterior dental organs (DO), and they manifest with painful symptoms and sensitivity to hot or cold drinks depending on the chronicity of the lesion¹. PLA is generally due to sequelae of pulpitis, with reversible (RP) or irreversible (IRP) pulpitis generating PA. PA or PG formation proceeds, depending on the host's response¹.

PLA are complex and challenging processes to treat, especially when it involves DO endodontically treated with relentless PL. Additional root canals, canal obstruction, perforations, fractured instruments, or mismatched posts in the root canals can make retreatment procedures difficult. Although root canal retreatment can give effective results, sometimes the lesions are not repaired; in such cases, surgical treatment, such as periapical surgery and extraction, are the only remaining options². Many times, if PLA persists after complete drainage of the infection, treatment is considered unsuccessful at this point. PLA can exist after root canal treatment and after the restoration has been accurately established, but AP often persists as a non-symptomatic radiolucency².

Six possible factors have been described due to which there are no symptoms of AP after root canal treatment: continuous intraradicular infection, foreign body reactions caused by a root filler material, extraradicular infection, presence of endogenous cholesterol crystals irritating the tissue periapical, actual cystic lesions

and scar tissue. However, microorganisms in the root canal system are the leading cause of AP².

The persistence of this type of lesion is progressive. On many occasions, if two or more are found close together, they tend to converge and spread to the maxillary sinus (MS), which are part of the paranasal sinuses located in the center of the face, which plays a vital role in maxillofacial anatomy due to its location, with excellent clinical implications³. Sinus pathology of dental origin is closely related to the spatial relationship of the posterior maxillary DO, mainly molars and premolars, with MS^{4,5}. Among the various dental conditions that lead to mucosal thickening and sinus pathology, the most common are AP, PG, incorrect or incomplete root canal treatments, severe periodontal disease, sinus fistulas, extractions, and dental implants, especially in the context of a close anatomical relationship between the maxillary teeth and the paranasal sinuses, which are diagnosable through CBCT-type tomography; although it is a relatively new technique, it has quickly become an important tool in the diagnosis of head and neck pathology, especially when talking about the maxillary bones and neighboring regions such as MS⁶.

If the dental cause is not removed due to misdiagnosis, then MS becomes chronic and must be temporarily controlled with antibiotic therapy. However, this solution is not permanent and can lead to more severe complications, such as antibiotic resistance and possibly, in rare cases, life-threatening infections⁷.

The diagnosis and radical treatment of PLA are usually accompanied by surgical procedures such as biopsy, even more so when DO conservation is desired. For the differential diagnosis of these lesions, the radiographic analysis alone is not con-

clusive due to several factors that make diagnosis difficult, among them, the different osteolytic lesions with similar characteristics, lack of PG and PK characteristics, and limitations of two-dimensional radiographic visualization, authors such as Fuentes et al.⁸; they point out that in order to reach definitive diagnostic confirmation, histopathological and immunohistochemical analysis, and coincidence with clinical and radiographic findings are necessary.

The objective of this article was to present a clinical case with an interdisciplinary approach of a confluent PLA in approximation to SM.

CLINICAL CASE

A 52-year-old female patient with no medical history of clinical relevance, whose reason for consultation, was referred for intermittent pain in the left hemi-facie of 4 months of evolution, crackling at palpation, without evidence of facial asymmetry. The intraoral clinical examination revealed a fistulous, yellowish, fluctuating lesion of 0.5 mm by 0.5 mm at the level of the vestibular gingiva of DO 25; there was no evidence of dental mobility of DO 24, 25, and 26, nor other symptoms related to changes of temperature (Figure 1).



Figure 1. Clinical image showing fistulous lesion at the vestibular level of RE 25.

An endodontist was immediately consulted, who identified during the anamnesis that the patient had resorted to conventional endodontic dental treatments and retreatments of 24 and 25, including a history of fracture of an endodontic instrument in a DO 24 root canal. Radiographic exam-

ination (periapical X-ray) revealed a radiolucent and circumscribed lesion measuring 12 mm by 8 mm in diameter, possibly confluent with RE 24 and 25, compatible with AA. The patient stated that the DOs were found with intracanal medication with calcium hydroxide (Figure 2).



Figure 2. Preliminary diagnostic radiographic image.

The tomographic evaluation (CBCT) showed a hypodense lesion measuring 12.8 mm in length in the sagittal cut and 10.6 mm in the axial cut, with loss of the vestibular cortex, beginning its extension from mesially from

DO 24 to DO 26 and observing compression and displacement of the floor of the left maxillary sinus (Figure 3A and 3B). Diagnostic impressions established then coincided with PA, PQ, or PG.

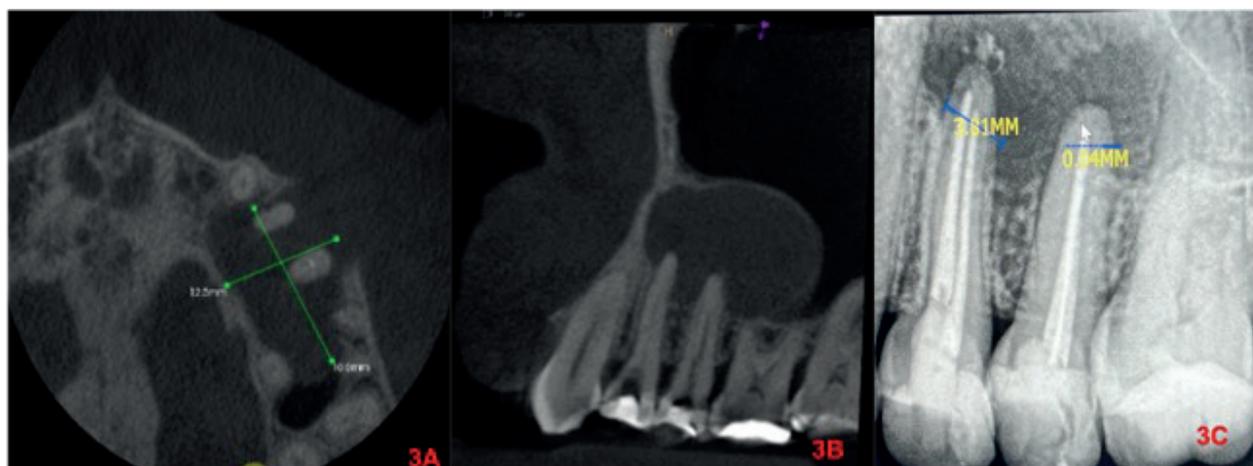


Figure 3. 3A. Hypodense lesion 12.8 mm long in the sagittal section. 3B. Hypodense lesion 10.6 mm in axial section with compression and 3C evidence of displacement of the maxillary sinus with millimeter parameters for an apicoectomy.

Using a surgical, stomatological, and endodontic meeting, a treatment plan is established prior to the signing of an informed consent by the patient, to whom the risks, benefits, and possible complications were explained: endodontic retreatments

are carried out in DO 24 and 25 without complications, in the same appointment, filling with bioceramic cement BioRoot RCS (Septodont, Saint- Maur -des- Fossés, France) (Figure 3C). In a second appointment under local anesthesia,

4% articaine with epinephrine 1:100,000 (ARTH-EEK®), two capsules, portero-superior and middle alveolar truncal technique together with anterior palatine, we proceeded to perform an intraoral surgical approach with a linear full-thickness flap, above the mucogingival line without relaxants. An apical 3 mm apicoectomy was performed, with DO 24 and 25, and sealing of the apical end achieved in conventional obturation through bioceramic cement was verified. BioRoot RCS (Septodont, Saint- Maur -des- Fossés, France),

followed by a complete biopsy of the periapical lesion, which during its removal showed resilient, rubbery, intense yellow, and hemorrhagic characteristics (Figure 4A, 4B, and 4C), was included in 10% formalin for subsequent histopathological analysis. Finally, the flap was closed using a 4-0 absorbable suture and pharmacological prescription with 875 mg amoxicillin, 125 mg clavulanic acid with a dose every 12 hours for five days, and NSAID-type anti-inflammatory analgesics every 6 hours for three days.



Figure 4. 4A. Surgical approach, linear incision with lifting the mucoperiosteal flap above the distal apices of RE 24 to 26. 4B. Surgical bone bed after removal of pathological tissue. 4C. Extracted pathological specimen.

The evolution and control at 15 postoperative days were satisfactory and favorable, especially the disappearance of symptoms, absence of swelling in the hemi -facial area, and adequate healing. The histo-

pathological report yielded a lesion compatible with PG; recommendations were recommended by the oral pathologist, who suggested immunohistochemical evaluation (Figure 5).

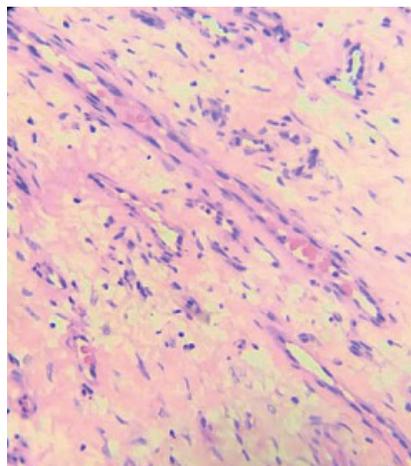


Figure 5. 40X histopathological image with hematoxylin-eosin staining that shows a band-type lesion of normal dense connective tissue with the presence of fibroblasts and hyalinized collagen, which is evidenced surrounded by a dense inflammatory infiltrate made up of lymphocytes, plasma cells and the presence of giant cells as well as blood vessels.

Immunohistochemistry was carried out to confirm through impermeable surface markers

and to rule out other types of lesions similar to PK (Figure 6).

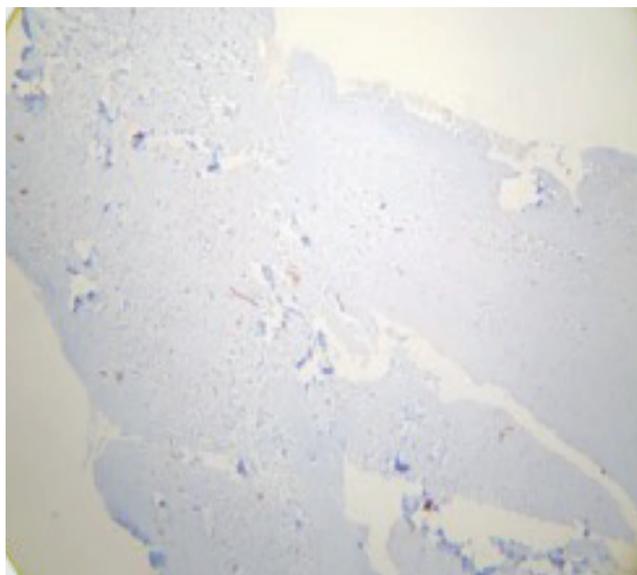


Figure 6. The negative immunohistochemical image for CK14 and CK19 is typical of periapical cystic lesions similar to PG.

DISCUSSION

Authors like Tesis et al.⁵ describe that in the maxillary RE with apical lesions, they usually present thickening of the mucosa and facial asymmetry due to complications such as SM with a tendency to increase with the size of the lesion, similar to what was presented in this case.

Foreign body reactions caused by a root filler material, extraradicular infection, the presence of endogenous cholesterol crystals that result in irritating tissue periapically, actual cystic lesions and scar tissue, as well as instrument fractures of the root canals are usually the causative factors of PG², for the present etiological case, could be associated with unsuccessful root canal treatments added to a history of fracture of an instrument challenging to remove from the canal.

The PK or radicular arises as a consequence of the PG; they are usually treated with conventional endodontic treatment, which in situations of failure can give rise to the persistence of the lesion 1; in the present case, there was a pre-surgical diagnostic impression of PK versus GP, having as definitive diagnosis of the latter.

Research considering cone beam computed tomography as a gold standard to study the anatomical variations of MS and odontogenic lesions or chronic sinusitis³. One of the advantages that CBCT provides is that it can offer high-resolution images of dental units and surrounding tissues and a 3D image of the investigated area³, as described in the present case where we were able to demonstrate left SM compression, and the size of the lesion, among other precise characteristics.

In addition to the anatomical relationship with the MS, molar, and premolar ODs more frequently develop dental pathologies, especially periapical⁵, similar to what was presented in the clinical case described.

Authors such as Villarreal et al.⁹ describe that it is possible to achieve an improvement in the periradicular tissues after the appearance of a GP-type lesion; for this to be possible, it is necessary to resort to techniques suitable for surgical radicals and use obturation materials retrograde with ideal characteristics to stimulate the healing of the affected tissues. Therefore, apical surgery followed by retrograde obturation is suggested for this type of case, as shown by the case presented.

PG is characterized histologically by presenting a chronic inflammatory cell infiltrate with T and B lymphocytes, plasma cells, and neutrophils, a fibrous capsule with some fibroblasts, truncated blood vessels, and may or may not present areas with epithelium¹⁰⁻¹⁴, coinciding with the present case reported.

In the present case, the oral pathologist suggested immunohistochemical evaluation in order to rule out the possible presence of a pseudocyst or cyto-keratin expression, which has been observed in the nucleus of proliferative or chemical cells and may prefer a marker to assess the state of the tissue in growth or evolution to another pathological entity¹⁵.

CONCLUSIONS

Usually, the prognosis of this type of clinical situation is guarded. However, it was evidenced that the interdisciplinary and radical management of confluent periapical lesions is of great help for their resolution or control, mainly because the comprehensive diagnosis with histopathology and immunohistochemistry allowed us to know in depth the nature and prognosis of the disease, as well as the conservation of the DO involved.

DECLARATION ON CONFLICTS OF INTEREST

The authors declare that they have no conflict of interest.

AUTHORS' CONTRIBUTIONS

Daniel Felipe Ortiz Ramírez: took photographs, searched bibliographically, and wrote the discussion draft.

Raúl Mario Betancourt Bermúdez: writing and description of the case.

Martha Leonor Rebolledo Cobos: surgical intervention of the case, histopathology, immunohistochemistry, and approval of the final version.

Adolfo Mario Marriaga Gutiérrez: made endodontic procedures, apicoectomy, retrograde obturation, and article conclusion.

Camilo Andrés Domínguez Ortega: surgical intervention of the case, bibliographic search, and style corrections.

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