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Original Article

Solitary Palatal Involvement in Medication-Related Osteonecrosis of the jaws: clinical profile and frequency.

Garola, Federico DDS, OMFS. ORCID: 0000-0001-8639-2057. Assistant Professor, Oral Medicine Department,Facultad de Odontología, Universidad Nacional de Córdoba, Argentina

Leonardi, Nicolás DDS, PhD. ORCID: 0000-0002-4450-0678. Assistant Professor, Oral Medicine Department, Dentistry School, Universidad Católica de Córdoba, Argentina.

Romero-Panico, Juan Cruz DDS, MSc. ORCID: 0009-0001-7263-1886 Assistant Professor, Oral Medicine Department,Facultad de Odontología, Universidad Nacional de Córdoba, Argentina

Gilligan, Gerardo DDS, PhD, ORCID: 0000-0002-5201-1444 Assistant Professor, Oral Medicine Department,Facultad de Odontología, Universidad Nacional de Córdoba, Argentina

Panico, René Luis DDS, PhD ORCID: 0000-0002-5833-5546 Head Professor Oral Medicine Department, Facultad de Odontología, Universidad Nacional de Córdoba, Argentina. Head Professor Oral Medicine Department, Dentistry School, Universidad Católica de Córdoba, Argentina.

[1]Oral Medicine Department, Facultad de Odontología, Universidad Nacional de Córdoba, Argentina

[2] Oral Medicine Department, Dentistry School, Universidad Católica de Córdoba, Argentina.

CORRESPONDING AUTHOR

Gerardo Gilligan DDS, PhD

Address: Haya de la Torre SN

Ciudad Universitaria, PC 5000

Córdoba, Argentina

E-mail: ggilligan@mi.unc.edu.ar

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Abstract

Objective. This study assessed the frequency and clinical features of MRONJ with exclusive palatal involvement at two Oral Medicine referral centers.

Methods. A retrospective cross-sectional study included consecutive patients diagnosed with MRONJ between 2016 and 2025 at two referral centers in Córdoba, Argentina. Clinical records, imaging studies, and histopathological reports were reviewed. The frequency of exclusive palatal involvement was determined, and demographic, clinical, radiographic, and histopathological characteristics were analyzed descriptively.

Results. Among 58 patients with MRONJ, 5 (8.6%) presented exclusive palatal involvement without concomitant maxillary or mandibular lesions. All patients were women (mean age, 78.4 years) receiving oral antiresorptive therapy for osteoporosis. Clinical findings ranged from mucosal breakdown to exposed necrotic bone with fistulization. Contributing local factors included prosthetic irritation and palatal exostoses. Imaging findings were often subtle or non-specific, whereas histopathological examination confirmed osteonecrosis when performed.

Conclusions. Exclusive palatal MRONJ is an uncommon but clinically significant presentation. Awareness of this atypical location may facilitate earlier diagnosis and improve management in patients receiving antiresorptive therapy.

Statement of Clinical Significance. Palatal MRONJ is an uncommon and potentially underrecognized presentation in patients receiving antiresorptive therapy. Clinicians should include MRONJ in the differential diagnosis of persistent palatal lesions, even without a torus or obvious bone exposure, and assess prosthetic trauma and other local risk factors to support early diagnosis and appropriate management.

Keywords: Medication-related osteonecrosis of the jaw; palate; antiresorptive therapy; torus palatinus; bisphosphonates

Introduction

Medication-related osteonecrosis of the jaw (MRONJ) is defined as the presence of persistent necrotic bone exposure lasting more than 8 weeks in patients treated with bisphosphonates (BP) or other antiresorptive agents, without a history of head and neck radiotherapy. MRONJ most commonly affects the mandible, with a mandible-to-maxilla ratio of approximately 2:1[1]. Palatal Medication-related Osteonecrosis (Palatal-MRON) represents an extremely rare clinical entity, with fewer than 15 cases reported in the literature to date. Most of these cases have been described in association with bony exostoses (palatal torus) which occur in 6–27% of the general population[2].

While MRONJ has been reported in non-alveolar anatomical sites such as the palatal bone, these presentations remain insufficiently characterized, lacking systematic investigation and standardized diagnostic criteria, which may contribute to underrecognition and underreporting. Palatal-MRON is uncommon on its own, and it becomes even rarer when occurring over a palatal torus in patients receiving BP. BP are potent inhibitors of osteoclastic activity and are capable of significantly modifying normal bone resorption processes[3]. Although the diagnosis is primarily clinical, imaging studies are useful for assessing the extent of the process, identifying the condition in its early stages, ruling out other diseases, and detecting potential complications[2,4]. Although biopsy is not required for diagnosis, it may be advisable in uncommon locations such as the palate. However, in a recent case review, all biopsies from clinical presentations compatible with osteonecrotic events in patients taking BP showed histological evidence of bone necrosis[5].

The most frequently reported risk factors in these cases include exposure to BP, the individual potency of each drug, the route of administration, the duration of therapy, and the cumulative dose. In addition, the risk increases with both the dosage and the length of treatment[1,6,7]. Moreover, even in cases of palatal-MRON—where bone-involved dental procedures are uncommon—dental interventions still represent a risk factor for this condition. Nevertheless, spontaneous cases and those triggered by local trauma have also been described. Smoking and systemic comorbidities may further contribute to the development of osteonecrosis, and genetic factors have likewise been reported to increase susceptibility[8].

Tori are localized, well-circumscribed bony exostoses arising from the cortical surface of the bone, covered by a thin and poorly vascularized mucosa [3,9]. They are benign anatomical variants of the oral cavity caused by prominent bony outgrowths known as hyperostoses, which most commonly occur in the palate and the mandible. [3]. They are usually asymptomatic, but frequent ulcerations, may occur due to trauma. They are more common in women than in men, and their incidence ranges from 12.3% to 26.9%.[2]. The palatal torus, the most common exostosis of the maxillofacial skeleton, is typically located along the midline of the hard palate [3,9,10]. In a previous study of patients with MRONJ involving oral tori, 53% of the lesions were located at the palatal torus; however, cases involving tori represented only 5.1% of the overall MRONJ cohort.[9]

Interestingly, although the palatal torus is considered a risk factor for the development of MRONJ, some reports highlight that MRON could also arise in the palate in the absence of a torus, suggesting that additional local or systemic factors may contribute to its development. The aim of this study was to assess the frequency and describe the clinical and demographic characteristics of MRONJ with exclusive palatal involvement in a cohort of patients diagnosed at two Oral Medicine referral centers. In addition, this study sought to identify associated risk factors and highlight clinically relevant features to support accurate diagnosis of this uncommon MRONJ presentation. To date, most available evidence consists of isolated case reports, limiting the possibility of identifying consistent clinical patterns or estimating the relative frequency of palatal involvement within the MRONJ spectrum.

Materials and Methods

A retrospective cross-sectional observational study was conducted including consecutive patients diagnosed with MRONJ between 2016 and 2025 at the Oral Medicine Department, Facultad de Odontología. Universidad Nacional de Córdoba Argentina and the Oral Medicine Department, Oral Health Science Faculty, Universidad Católica de Córdoba, Argentina. Clinical records from both centers were reviewed, and all consecutive cases fulfilling the diagnostic criteria for MRONJ were identified.

The inclusion criteria for the overall cohort were: (1) a diagnosis of MRONJ according to the AAOMS criteria; (2) diagnosis and follow-up at either of the two participating centers between 2016 and 2025; and (3) availability of sufficient clinical and diagnostic information to confirm the diagnosis and determine the anatomical site of involvement. Patients with a history of radiation therapy to the jaws or metastatic disease involving the jaws, as established by the AAOMS diagnostic criteria, as well as those

with insufficient clinical or diagnostic information to confirm MRONJ or determine its anatomical distribution, were excluded.

Patients presenting with exclusive palatal involvement, defined as osteonecrosis confined to the palatal bone without concomitant maxillary or mandibular involvement, were identified for descriptive analysis. Cases lacking complete clinical or diagnostic data were excluded. Demographic data, medical history, type and duration of antiresorptive therapy, clinical presentation, anatomical location, imaging findings, and histopathological reports (when biopsy was performed) were collected.

Ethical Considerations. All procedures involving human participants were conducted in accordance with the ethical standards of the Declaration of Helsinki and its subsequent amendments. The present retrospective and study was developed as part of the study entitled "Epidemiological and clinical description, and factors associated with oral mucosal diseases in patients from the Oral Medicine Department," which was approved by the Comité Académico en Ciencias de la Salud of the Facultad de Odontología, Universidad Nacional de Córdoba (26-10-2024). All patients signed informed consent, and their identities were anonymized.

Results

A total of 58 patients diagnosed with MRONJ and with complete data for all the variables described above were included in the study. The mean age was 73.67 years (range: 49–88 years), comprising 45 women (77.6%) and 13 men (22.4%). Exclusive palatal involvement represented 8.6% (n=5) of all MRONJ cases diagnosed in the study period. All five patients were women, with a mean age of 78.4 years, and all had a history of low-dose antiresorptive therapy prescribed for osteoporosis. The clinical, pathological, and epidemiological characteristics of these cases are described in detail below.

Case 1. A 78-year-old female presented with discomfort in the palatal region. The patient reported a spontaneous onset of symptoms beneath her maxillary complete denture. Her medical history included controlled diabetes and hypertension; she was a non-smoker and had osteoporosis treated with oral alendronate for the past 5 years. The lesion had been evolving for approximately 6 weeks and caused denture maladaptation. Clinically, a palatal swelling with an abscess-like appearance and active suppuration was noted, although without exposed bone (Figure 1 D). No palatal torus was present. Computed tomography revealed no significant findings with a slight erosion of the palatal bone. Given the atypical palatal presentation, absence of clinically exposed bone, and non-specific imaging findings, an incisional biopsy was performed primarily to exclude a minor salivary gland neoplasm and other relevant differential diagnoses, rather than to

confirm a presumptive diagnosis of MRONJ. During the procedure, a small fragment of hard tissue was retrieved from the lesion, consistent with a micro-sequestrum. Histopathology revealed chronic inflammation, granulation tissue with areas of necrosis and non-vital, avascular bone (Figure 2 A, B, C, D). Complementary tests for deep fungal infections, as well as for autoimmune and vasculitic diseases, were negative. The final diagnosis was medication-related palatal osteonecrosis. No other areas of osteonecrosis were identified in the maxilla or mandible.

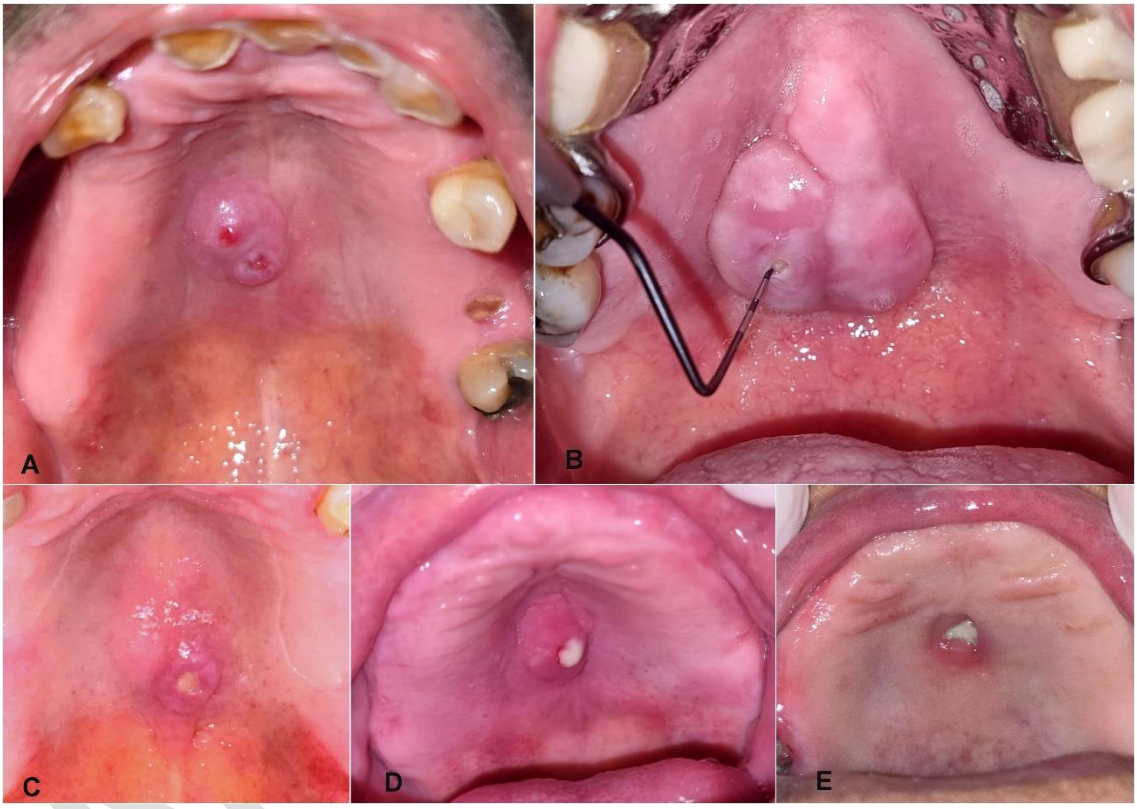


Figure 1. Clinical aspects of palatal medication-related osteonecrosis of the jaw (MRONJ) associated with antiresorptive therapy.

A: Initial clinical presentation showing a localized palatal swelling with erythematous mucosa and a small central ulcerated area in the posterior hard palate. On palpation, the lesion was hard, and the surface exhibited two small fistulous tracts with mild purulent discharge.

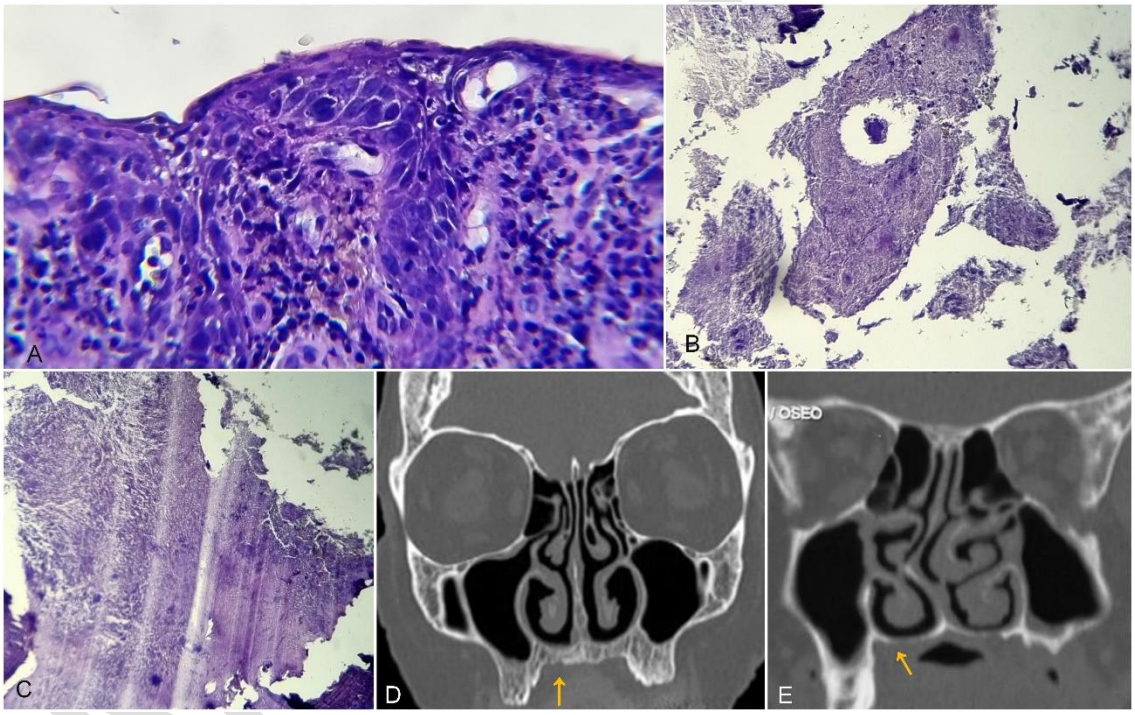
B: Close-up view demonstrating a nodular palatal compatible with a palatal exostosis or torus, with a central fistulous opening. Probing revealed underlying bone involvement, and the area of exposed necrotic bone was painful during clinical examination.

C: Palatal lesion showing mucosal breakdown and exposure of necrotic bone at the center of the swelling. A peripheral erythematous rim surrounding the exposed bone,

forming a collar-like appearance, was observed and was associated with patient discomfort.

D: Clear visualization of a palatal fistula with active purulent discharge, intensely painful on examination, surrounded by inflamed palatal mucosa. The lesion caused poor adaptation of the patient's complete denture. Surgical removal was performed to establish a definitive diagnosis; histopathological findings are shown in Figure 2.

E: Advanced clinical stage showing persistent bone exposure with surrounding mucosal erythema and poor healing of the palatal defect.



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Case 2. An 84-year-old female was referred for evaluation of a palatal lesion of 3 months' duration, with no history of trauma or local injury. Her medical history included controlled diabetes and hypertension; she was a non-smoker and had been taking oral risedronate for osteoporosis (for more than 3 years, though the exact duration was unknown) (Figure 1-C). Clinical examination revealed an elevated lesion with multiple draining fistula openings, located paramedially to the right of the midline. A focal area of persistent bone exposure was observed. No triggering factors were identified. Complementary tests for fungal infections, as well as for autoimmune and vasculitic diseases, were negative, effectively ruling out these conditions as potential givers to the palatal necrosis. The patient declined surgical management and opted for conservative monitoring. The lesion was diagnosed as medication-related palatal osteonecrosis.

Case 3. A 74-year-old female with a long-standing palatal torus (present for more than 30 years) reported recent discomfort and enlargement of the lesion over the preceding months. She had no relevant systemic comorbidities, was a non-smoker, and was taking oral alendronate for osteoporosis (dose unknown). Examination revealed a midline palatal torus with areas of tenderness and suppuration. A focal bone exposure was detected using a periodontal probe (Figure 1-B). The patient was referred to an oral and maxillofacial surgeon, who performed the palatal torus removal with sequestrectomy under general anesthesia. Complementary tests for autoimmune and vasculitic diseases, were negative, ruling out these conditions as potential contributors to bone necrosis. Healing was uneventful, and no recurrence was noted during follow-up. The final diagnosis was medication-related osteonecrosis involving the palatal torus.

Case 4. A 68-year-old female presented with a 7-month-old palatal lesion. Her medical history was unremarkable except for osteoporosis treated with oral ibandronate for 3 years. Clinically, a palatal ulcer with exposed bone was observed, without suppuration and with mild tenderness on palpation. No palatal torus or traumatic antecedents were documented (Figure 1-E). Clinical improvement was achieved with topical chlorhexidine dressings, antibiotic therapy, and removal of a superficial necrotic tissue fragment. Tests for deep fungal infections (PAS and Grocott within the sequestrum), as well as for autoimmune and vasculitic diseases, were negative. The diagnosis was medication-related palatal osteonecrosis.

Case 5. An 88-year-old female with uncontrolled diabetes, senile dementia, and advanced osteoporosis presented with a painful palatal lesion. Medical records confirmed alendronate intake, although dosage and duration could not be determined due to the patient's cognitive impairment. Clinical examination revealed a multilobulated, firm lesion with multiple fistula openings on its surface. Mild suppuration was elicited upon probing. No palatal torus or identifiable local triggers were found. Complementary tests for deep fungal infections, as well as for autoimmune and vasculitic diseases, were negative. The lesion was diagnosed as medication-related palatal osteonecrosis (Figure 1-A). The patient declined any surgical intervention and accepted only antibiotic therapy for symptomatic management.

DISCUSSION

The present study highlights an uncommon anatomical presentation of MRONJ confined exclusively to the palate, expanding the currently limited body of evidence regarding non-alveolar involvement. While MRONJ typically involves the mandible or maxilla, palatal involvement remains scarcely documented in the literature, with only a limited number of cases reported to date[2–4]. Our findings expand current knowledge by describing five cases identified in our cohort, reinforcing that although uncommon, palatal MRON represents a clinically significant entity that may be overlooked if clinicians are unfamiliar with its presentation.

The present cases, derived from a cohort of 58 patients diagnosed with MRONJ, highlight the exceptional occurrence of osteonecrosis involving the palatal bone. This subgroup of five patients diagnosed with medication-related osteonecrosis confined exclusively to the palate, without maxillary or mandibular involvement, represents an uncommon anatomical presentation within the MRONJ spectrum. From an epidemiological standpoint, this palatal MRONJ subgroup did not differ substantially from the overall MRONJ profile, which predominantly affects elderly female patients. When

compared with the intracohort subgroup of patients presenting with “classical” MRONJ, those with exclusive palatal involvement exhibited a slightly higher mean age (78.4 vs 72.17, respectively). Although this difference should be interpreted with caution due to the small number of cases, it suggests that palatal MRONJ may occur in an older subset of the MRONJ population.

The palate represents an anatomically vulnerable site for the development of MRONJ, both in the presence and absence of palatal tori. When a torus is present, several structural features significantly increase susceptibility: the mucosa covering the torus is extremely thin, tightly adherent, and poorly vascularized, making it highly prone to ulceration from routine functional microtrauma[2,9,10]. Additionally, the torus consists of dense cortical bone with limited vascularity and minimal remodelling capacity; when this bone becomes exposed in patients receiving antiresorptive therapy, the impaired turnover prevents adequate healing and favors the progression to osteonecrosis[1,6,8]. Accordingly, palatal torus may act as a local predisposing factor rather than as a prerequisite for palatal MRONJ. Its anatomical prominence and thin overlying mucosa may increase susceptibility to repetitive mechanical trauma, mucosal ulceration, and subsequent bone exposure, particularly in patients wearing removable prostheses. Importantly, however, only one of the five patients in our series presented with a palatal torus, suggesting that other local anatomical and systemic factors may also contribute to the development of palatal MRONJ.

MRONJ may also occur in palatal sites without exostoses. The hard palate naturally exhibits firm and relatively hypovascular mucosa, reduced tissue elasticity, and a thin cortical plate located close to the surface. The median palatine raphe corresponds to the midpalatal suture—a fibrous junction formed embryologically by the fusion of the palatal shelves through intramembranous ossification, which typically reaches advanced stages of maturation around 12 years of age. Beyond this period, the suture demonstrates progressive maturation with reduced remodeling capacity and decreasing osteoblastic activity through adolescence and into adulthood, reflecting its inherently limited bone activity compared with the surrounding palatal cortical bone[10,11]. These natural conditions may predispose to compromised mucosal repair even after minor injuries. In such settings, repeated low-grade trauma, including irritation from maxillary complete dentures or partial dentures, may act as a primary triggering factor[7]. Notably, in our series, prosthesis-related trauma was identified as a probable contributing factor in three cases. Systemic conditions such as diabetes, local infection, and the known microvascular alterations induced by BP may further amplify susceptibility[6,8]. Nam et al. reported a case in which a prolonged and unsupervised history of bisphosphonate

therapy, together with poorly controlled diabetes mellitus, likely contributed to disease development, ultimately complicated by the formation of an oro-nasal communication[12]. These combined local and systemic factors offer a plausible explanation for why MRONJ can arise on the palate even in the absence of palatal torus, highlighting the complex interplay between mucosal integrity, vascularity, mechanical insult, and pharmacologic suppression of bone turnover.

The principal differential diagnoses for palatal-MRON include a wide spectrum of infectious, inflammatory, and neoplastic conditions. Necrotizing bacterial infections, necrotizing sialometaplasia and mucormycosis may present with ulceration, tissue sloughing, or exposed bone and should be carefully excluded, especially in immunocompromised patients. Fungal infections such as invasive candidiasis or aspergillosis and mucormycosis can also mimic early stages of palatal osteonecrosis. Among inflammatory and autoimmune conditions, granulomatosis with polyangiitis, lupus erythematosus, tertiary syphilis, and sarcoidosis may produce chronic ulcerations or destructive palatal lesions. Malignant neoplasms, including oral squamous cell carcinoma, minor salivary gland tumors, and lymphomas, must always be considered due to their overlapping presentation with persistent non-healing ulcers[13,14]. Chronic traumatic wounds, and thermal or chemical burns further expand the differential. Additionally, palatal perforations associated with intranasal cocaine use[15] represent an important consideration, as drug-induced ischemia and chronic vasoconstriction can lead to midline destructive lesions that closely resemble palatal-MRON. A comprehensive clinical, radiographic, microbiological, and histopathological evaluation is essential to distinguish these entities from true palatal-MRON[5]. Therefore, biopsy should not be considered a routine diagnostic procedure for suspected palatal MRONJ but may be justified in atypical presentations when exclusion of malignancy, invasive infection, or other destructive conditions is clinically necessary. Importantly, the histopathological findings of osteonecrosis are not specific to MRONJ and should always be interpreted in conjunction with medication history, clinical and imaging findings, and exclusion of alternative causes of bone necrosis.

Although current international guidelines (AAOMS, ECTS, MASCC/ISOO) provide general diagnostic criteria for MRONJ[1,6,8], there are no specific criteria for palatal-MRON, largely because this presentation is exceptionally rare and often overlaps with several destructive midline pathologies[2–4]. In palatal lesions, relying solely on the traditional requirement of bone exposure may lead to diagnostic delay, as mucosal breakdown may be subtle and exposure occurs later than in alveolar sites[5].

Although preliminary, these site-adapted diagnostic considerations are intended to provide a conceptual framework to facilitate recognition of palatal MRONJ, particularly in cases in which classical alveolar bone exposure is absent or delayed. They were derived from the clinical findings observed in our five cases together with the limited available literature and should not be interpreted as validated diagnostic criteria. Rather, they represent a preliminary clinical framework that requires further evaluation in larger case series and independent patient cohorts before its diagnostic utility can be established (Table 1).

Table 1 - Proposed Diagnostic Criteria for Palatal-MRON

A. Major Criteria (must meet ALL)	**B. Minor Criteria (supportive, not required)**
1- Current or past use of antiresorptive or antiangiogenic medications. 2- Persistent palatal ulceration or mucosal breakdown (>8 weeks) with bone exposure or bone probe-through in the palatal vault. 3- Absence of prior radiotherapy to the maxilla, sinonasal tumors, or other known causes of palatal osteonecrosis. 4- Imaging evidence (CBCT/CT/MRI) of palatal cortical disruption, sequestra, or palatal bone necrosis.	- Palatal pain, swelling, or fistulization. - Presence of palatal sequestrum or yellowish necrotic sloughing. - No evidence of fungal invasion (PAS/Grocott). - Negative ANCA panel (to exclude GPA). - Negative toxicology for cocaine (depending on context). - Histology compatible with osteonecrosis (empty lacunae, necrotic bone, inflammation).

Although biopsy is not generally required for the diagnosis of MRONJ, as the diagnosis is primarily clinical and supported by imaging studies[1], its use becomes more relevant in atypical locations such as the palate[5]. In these scenarios, biopsy may be advisable for several reasons: (a) to rule out critical differential diagnoses, including squamous cell carcinoma, lymphoma, invasive fungal infections (such as mucormycosis or aspergillosis), and necrosis related to vasculitis or autoimmune disorders; (b) to confirm bone necrosis in cases with an uncommon clinical presentation; and (c) to support therapeutic decision-making when the choice between conservative and surgical

management requires diagnostic certainty. When biopsy is performed, submission of the specimen for microbiological analysis—including bacterial and fungal cultures—is recommended, particularly to identify or exclude superimposed infections that may influence treatment strategies. As a limitation, in our series, two cases did not undergo biopsy, which should be considered when interpreting the findings.

Finally, current literature presents several limitations regarding the management of palatal-MRON. Most reports tend to favour radical therapeutic approaches, primarily involving surgical removal of the affected necrotic bone. However, such interventions may inevitably lead to the development of oro-nasal or oro-antral communications, given the close anatomical relationship with the nasal cavity and maxillary sinuses. For this reason, thorough tomographic evaluation is essential when selecting the most appropriate treatment strategy. In selected cases, a more conservative approach, such as sequestrectomy, may be considered. Notably, Correia-Neto et al. reported successful conservative management, achieving complete healing following sequestrectomy[16].

This study has several limitations that should be acknowledged. Its retrospective design and the limited number of cases with exclusive palatal involvement restrict the possibility of statistical comparisons and preclude causal inferences. In addition, the study was conducted in two referral Oral Medicine centers, which limit the generalizability of the findings. Not all cases underwent histopathological confirmation, reflecting real-world clinical practice in atypical MRONJ presentations; however, in these cases, the remaining proposed diagnostic criteria were systematically fulfilled, particularly those related to the exclusion of other local or systemic conditions associated with palatal osteonecrosis, including invasive fungal infections (such as mucormycosis), malignant neoplasms, prior radiotherapy to the jaws, autoimmune or vasculitic disorders, and other destructive oral entities. Finally, the proposed site-adapted diagnostic considerations for palatal MRONJ are hypothesis-generating, as they were not prospectively applied or externally validated, underscoring the need for future multicenter studies to confirm their diagnostic utility.

CONCLUSION

This study represents an initial effort to characterize palatal MRONJ as a distinct anatomical presentation within the spectrum of MRONJ. Although uncommon, this entity may be underrecognized due to its atypical location and subtle early clinical manifestations.

Our findings suggest that palatal MRONJ can occur both in the presence and absence of palatal torus, particularly in the presence of local mechanical trauma and/or

systemic comorbidities in patients receiving antiresorptive therapy. Chronic mucosal irritation, especially associated with removable prostheses, may represent a relevant local contributing factor in non-alveolar sites.

Increased awareness of this presentation may improve early diagnosis, facilitate appropriate differential diagnosis of palatal lesions, and support preventive strategies, including careful prosthetic evaluation and monitoring of palatal exostoses in patients receiving antiresorptive drugs. Further multicenter studies are required to validate the proposed diagnostic considerations and to better define the clinical spectrum of palatal MRONJ.

Author Contributions

Gerardo Gilligan: Conceptualization, methodology, investigation, data curation, formal analysis, interpretation of data, writing—original draft preparation, and supervision.

Federico Garola: Investigation, data collection, clinical assessment, data curation, and writing—review and editing.

Nicolás Leonardi: Investigation, data collection, clinical assessment, and writing—review and editing.

Juan Cruz Romero-Panico: Formal analysis, data interpretation, methodology, and writing—review and editing.

René Panico: Conceptualization, methodology, supervision, data interpretation, critical revision of the manuscript, and project administration.

All authors contributed substantially to the study.

Ethical approval: The present retrospective and case series study was developed as part of the study entitled "Epidemiological and clinical description, and factors associated with oral mucosal diseases in patients from the Oral Medicine Department," which was approved by the Comité Académico en Ciencias de la Salud of the Facultad de Odontología, Universidad Nacional de Córdoba (26-10-2024). This study was conducted following the Helsinki Declaration of 1975, as revised in 2000. All patients signed informed consent, and their identities were anonymized.

No conflicts of interest

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Informed consent were obtained in accordance with institutional requirements.

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FIGURE LEGENDS

Figure 1. Clinical aspects of palatal medication-related osteonecrosis.