Osteorradionecrose Após Extração Dentária: Um Relato de Caso

Osteoradionecrosis After Tooth Extraction: A Case Report

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DOI: https://doi.org/10.29315/gm.908

RESUMO

O presente caso clínico relata uma mulher de 65 anos com história prévia de carcinoma basocelular (CBC) da face, tratada inicialmente com cirurgia, e após recidiva com cirurgia e radioterapia. Nove anos depois, foi realizada uma extração dentária na mesma zona previamente irradiada, levando ao desenvolvimento de osteorradionecrose (ORN).

PALAVRAS-CHAVE: Extração Dentária;Osteorradionecrose/etiologia

ABSTRACT

This clinical case reports on a 65-year-old woman with a previous history of facial basal cell carcinoma (BCC), initially treated with surgery, and after recurrence, with surgery and radiotherapy. Nine years later, a tooth extraction was performed in the same site where she had previously received radiation therapy, leading to the development of osteoradionecrosis (ORN).

KEYWORDS: Osteoradionecrosis/etiology; Tooth Extraction

INTRODUCTION

BCC is a locally invasive tumor originating from the basal layer of the epidermis.[1] It ranks as the most common form of skin cancer in humans, with a predilection for occurrence on the nose.[2] While excisional surgery is the preferred treatment option, radiotherapy (RT) is occasionally necessary for recurrent tumors,[1] despite its documented side effects.[3] This clinical case report highlights the development of osteoradionecrosis after a tooth extraction performed at a site previously irradiated for BCC.

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Recebido/Received: 2024-05-06. Aceite/Accepted: 2025-07-27. Publicado online/Published online: 2025-09-15; Publicado/Published: 2025-12-30.

CASE REPORT

We present the case of a 65-year-old woman initially diagnosed with basal cell carcinoma on the tip and right side of the nose in 2005. She underwent excisional surgery with cancer-free margins and subsequent reconstruction using a chondro-bicutaneous graft harvested from the costal cartilage, encompassing the wing, dorsum, and tip of the nose. A recurrence was identified in 2010, prompting another surgical intervention involving a new excision of the tumor and again a graft reconstruction from the same site.

In 2013, a biopsy confirmed the presence of a new tumor site in the nasal vestibule. A third surgery was performed where excision of the tumor area was performed with intraoperative margin control, including frozen section analysis of the lateral and deep margins. Reconstruction was carried out using a nasogenian flap and a cartilage graft harvested from the right ear.

Healing proved challenging due to ischemia in the graft, resulting in necrosis of the tip and right nostril.

Subsequently, the patient underwent hyperbaric oxygen therapy (HBOT) and radiotherapy. After 13 HBOT sessions, the patient received 17 radiotherapy sessions, with a cumulative radiation dose of 51 Gy.

In October 2022, the patient underwent tooth extraction of the upper right molar (UR6) due to apical infection. Shortly thereafter, an implant in the same region became dislodged, leading to the development of a buccal-nasal fistula. Although the fistula initially appeared to heal spontaneously, further examination revealed the presence of osteoradionecrosis at the extraction site (Fig. 1).

Following the diagnosis of ORN and unsuccessful attempts at surgical closure of the buccal-nasal fistula, the patient was referred to the maxillofacial surgery department for further management. In August 2023, a surgical procedure was carried out to close the fistula using Bichat's fat pad, chosen for its anatomical proximity and rich vascularity, which promotes healing and minimizes the risk of complications such as flap necrosis.[5] This was combined with a pediculated graft, which involves partially detaching a portion of mucosa while preserving its blood supply through a "pedicle" or base, allowing it to be repositioned to cover and close the wound or defect, however, due to the compromised blood supply in the area, the main goal of the surgery was not achieved.

In September 2023, the patient presented to the dental department with complaints of severe mobility and suppuration of an implant on the upper left side, along with liquid passage through the nose, nutritional deficits, and a strong odor. Clinical examination revealed peri-implantitis associated with the implant replacing UL3 on the left side. Additionally, a more extensive lesion involving partial loss of hard palate tissue and total loss of all implants on the right side was observed.

Given the failure of previous interventions, the maxillofacial surgery and dental department had to plan a more aggressive surgical approach. In November 2023,

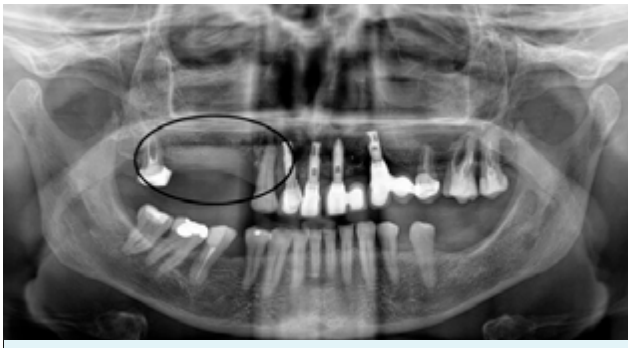

FIGURE 1. First panoramic x-ray revealing bone defect.

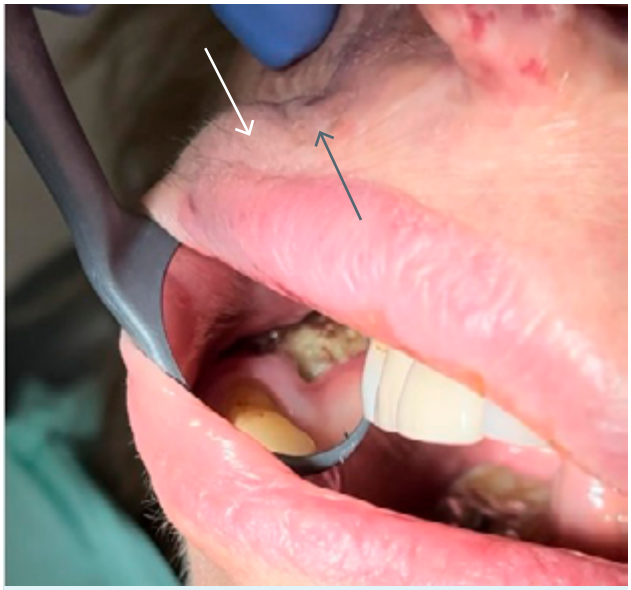

FIGURE 2. First observation

FIGURE 3. First observation

Clinical assessment and photography were hindered by the rigidity and reduced elasticity of the skin resulting from multiple previous surgeries and scar tissue formation4 (Figs. 2 e 3)

UL5 and all implants were removed, and infected bone and granulation tissue were debrided. Simultaneously, an immediate obturator prosthesis was placed to close the communication and replace the missing teeth.

The first follow-up appointment, three weeks post-operation, showed a clean cavity with no signs of inflammation (Fig. 4), indicating the effectiveness of the new denture. The patient reported improved upper lip support and satisfaction with the final aesthetics (Fig. 5). Occlusal adjustments were performed on the denture to enhance eating comfort.

In December 2023, a second follow-up appointment revealed no notable changes. The patient reported improved ability to eat without complaints of nasal passage or odor.

The third follow-up appointment, two months post-operation, in January 2024, demonstrated healthy and clean mucosa (Fig. 6) along with a well-sanitized denture, which is the key to the asepsis of the cavity. Once again, the density and fibrotic nature of the cheek and lip skin posed challenges for photography.

At this juncture, the patient expressed interest in options for upper lip augmentation and was discharged to pursue further treatment.

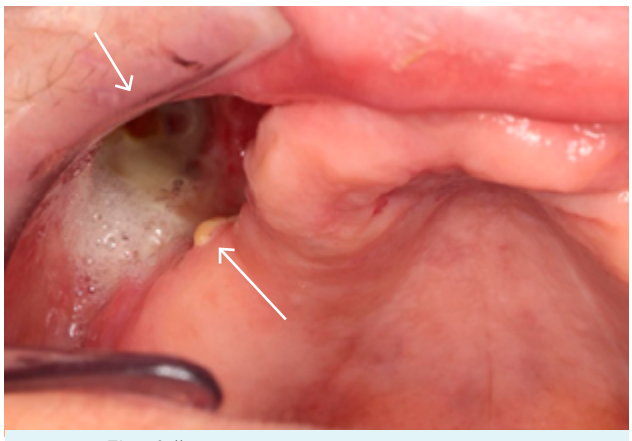

FIGURE 4. First follow-up post-op

FIGURE 5. Obturator prosthesis

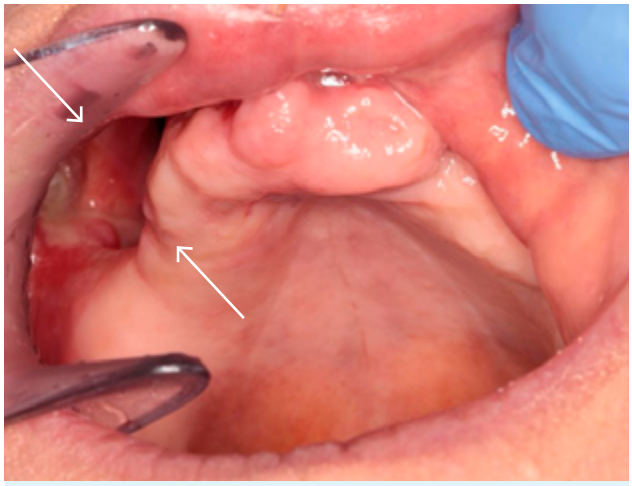

FIGURE 6. Third follow-up

DISCUSSION

Osteoradionecrosis is a side effect that could occur in irradiated bone, with teeth extractions being the most significant risk factor.[6] Radiation induces inflammation and obliteration of the blood vessels supplying the bone, resulting in avascular necrosis characterized by hypoxic, hypovascular, and hypocellular lesions.[7] In this case, such necrosis led to the failure of all surgical procedures, as no healthy bone was present to receive any potential bone graft.

The challenge in these cases lies in determining the optimal timing for dental surgery, as osteoradionecrosis can manifest anytime between 3 months to 13 years after radiotherapy and several factors must be considered, including the type of radiotherapy, radiation dose, tumor type and size, patient risk factors and type of surgery.[8] Although in this case the cumulative radiotherapy dose was 51 Gy—below the commonly reported threshold of increased risk—it remains crucial to perform an atraumatic surgical procedure and ensure primary closure of the soft tissues to minimize the risk of osteonecrosis of the jaw, particularly in dentulous patients, who are at higher risk compared to edentulous individuals.[9-11]

In this specific case, due to the extent of the buccal-nasal communication, the only viable solution found was the immediate placement of an obturator prosthesis. This not only closed the cavity but also restored chewing and speech functions, as well as the patient's aesthetics.[11]

This case presented a formidable challenge, with no ideal treatment option available. However, the solution devised by the dental team enabled the patient to regain a normal quality of life.

CONCLUSION

The multidisciplinary approach of maxillofacial surgery, oncology and dental teams is fundamental in guiding these patients, as there are no standard treatments and each must be individualized to the patient. The importance of the patient's medical history is emphasized, as the incidence of head and neck neoplasms has been increasing, with radiation therapy often included in the treatment of these tumors, which can lead to long--term complications.

This case serves to draw attention to healthcare professionals that treatments applied to patients can lead to difficult-to-control and resolve complications, emphasizing the need for dental evaluation of patients undergoing oncological treatment in the three phases of treatment: before, during, and after.

DECLARAÇÃO DE CONTRIBUIÇÃO /CONTRIBUTORSHIP STATEMENT

TG - Execução, redação e concepção do artigo.

FC, MCG - Análise, interpretação e concepção.

Todos os autores aprovaram a versão final a ser publicada.

TG - Execution, writing and design for article.

FC, MCG - Analysis, Interpretation and conception.

All the authors approved the final version to be published.

RESPONSABILIDADES ÉTICAS

CONFLITOS DE INTERESSE: Os autores declaram a inexistência de conflitos de interesse na realização do presente trabalho.

FONTES DE FINANCIAMENTO: Não existiram fontes externas de financiamento para a realização deste artigo.

CONFIDENCIALIDADE DOS DADOS: Os autores declaram ter seguido os protocolos da sua instituição acerca da publicação dos dados de doentes.

CONSENTIMENTO: Consentimento do doente para publicação obtido.

PROVENIÊNCIA E REVISÃO POR PARES: Não comissionado; revisão externa por pares.

ETHICAL DISCLOSURES

CONFLICTS OF INTEREST: The authors have no conflicts of interest to declare.

FINANCIAL SUPPORT: This work has not received any contribution, grant or scholarship.

CONFIDENTIALITY OF DATA: The authors declare that they have followed the protocols of their work center on the publication of patient data.

PATIENT CONSENT: Consent for publication was obtained.

PROVENANCE AND PEER REVIEW: Not commissioned; externally peer-reviewed.

REFERENCES

1. Baxter JM, Patel AN, Varma S. Facial basal cell carcinoma. BMJ. 2012;345:e5342. doi: 10.1136/bmj.e5342.
2. 2. Mohapatra DP, Friji MT, Dinesh Kumar S, Chittoria RK, Pathan I, Koliath S. Reconstruction of Defects Following Excision of Basal Cell Carcinoma of Face: A Subunit-based Algorithm. J Cutan Aesthet Surg. 2023;16:1-13. doi: 10.4103/JCAS.JCAS_87_21.
3. Pagare S, Khosa SK. Osteoradionecrosis. Int J Head Neck Surg. 2011;2:27-32. doi: 10.5005/jp-journals-10001-1043
4. Almadori A, Butler PE. Scarring and skin fibrosis reversal with regenerative surgery and stem cell therapy. Cells. 2024;13:443. doi: 10.3390/cells13050443.
5. Nelke K, Morawska A, Błaszczyk B, Janeczek M, Pasicka E, Łukaszewski M, et al. Anatomical and surgical implications of the usage of bichat fat pad in oroantral communication, maxillary, palatal, and related surgeries-narrative review. J Clin Med. 2023;12:4909. doi: 10.3390/jcm12154909.
6. Lajolo C, Rupe C, Gioco G, Troiano G, Patini R, Petruzzi M, et al. Osteoradionecrosis of the Jaws Due to Teeth Extractions during and after Radiotherapy: A Systematic Review. Cancers. 2021; 13:5798. doi: 10.3390/cancers13225798.
7. Lončar Brzak B, Horvat Aleksijević L, Vindiš E, Kordić I, Granić M, Vidović Juras D, et al. Osteonecrosis of the Jaw. Dent J. 2023;11:23. doi: 10.3390/dj11010023.
8. Ajila V, Hegde S. Osteoradionecrosis - a review of clinical features and management. Gulhane Med J.2020;62:213–23. doi: 10.4274/gulhane.galenos.2020.1076
9. Morrish RB Jr, Chan E, Silverman S Jr, Meyer J, Fu KK, Greenspan D. Osteonecrosis in patients irradiated for head and neck carcinoma. Cancer. 1981;47:1980-3. doi: 10.1002/1097-0142(19810415)47:8<1980::aid-cncr2820470813>3.0.co;2-y.
10. Zehr LJ, Cooper JS. Mandible Osteoradionecrosis. 2023. In: StatPearls: Treasure Island; 2025.
11. Goiato M, Micheline D, Santos Paulini M, Arsufi, G. (Prótese parcial removível obturadora -uma reabilitação oral que devolve o bem-estar físico e mental Removable partial denture obturator -an oral rehabilitation that restores physical and mental well-being [retrieved May 1, 2024] Available from: https://editoraplena.com.br/wp-content/uploads/2019/08/prótese-parcial-removível.pdf.