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In regard to Castagnola et al. (doi: 10.1186/s12903-023-03050-7)

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Abstract

We are grateful to the authors of the study by Castagnola et al., which sought to ascertain the prevalence of tooth necrosis in patients undergoing mandibulotomy or mandibulectomy for head and neck cancer. In order to prevent surgical problems, the researchers suggested doing root canal therapy on the teeth next to the surgical site prior to surgery. Although the results offer insightful information about tooth necrosis in patients with head and neck cancer who have had mandibulotomies or mandibulectomy, we would like to voice our concerns about the reported data in order to give a stronger basis for future studies in this field.

Dear Editor,

We would like to express our gratitude for the study conducted by Castagnola et al. [1], whose main objective was to determine the incidence of tooth necrosis in patients with head and neck cancer who underwent mandibulotomy or mandibulectomy. This case series comprises fourteen individuals who underwent either segmental mandibulectomy or paramedian mandibulotomy for the treatment of oral, oropharynx, or major salivary gland cancer. A total of twenty-three teeth were included in the analysis. A total of 12 individuals received adjuvant radiotherapy (RT). Following the surgical procedure, teeth located at the margin of mandibulectomy and teeth adjacent to mandibulotomy were subjected to cold sensitivity and/or electric pulp-testing. If the results of the cold sensitivity testing were uncertain or negative, the teeth were then subjected to electric pulp testing to assess their sensitivity. The state of a tooth was classified as "positive" when it was deemed healthy, while a "negative" state indicated the presence of disease. Twelve teeth exhibited a negative response in 10 patients who underwent mandibulotomy. The four patients who underwent mandibulectomy exhibited 2 positive and 3 negative responses when subjected to cold and electric pulp tests. A total of 65.2% (15 out of 23) of the teeth exhibited a negative test response when subjected to sensitivity testing. Based on their findings, the authors concluded that tooth necrosis appears to be a frequent side effect of mandibulectomy and mandibulotomy. Hence, the researchers recommended performing root canal therapy before surgery on the teeth adjacent to the surgical site as an appropriate strategy for avoiding post-surgical complications. While the results provide valuable insights into tooth necrosis in head and neck cancer patients who have undergone mandibulotomy or mandibulectomy, we would like to express our concerns regarding the presented results to establish a more robust foundation for future research in this area.

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The etiology of necrosis in the dental and mandibular region primarily stems from a hypoxic milieu, which can be attributed to surgical vascular trauma, radiation-induced vascular occlusion, or a combination of both factors [2–5]. Two different surgical resections can be performed to treat oral cancer involving the mandible. These procedures are known as paramedian mandibulotomy and segmental mandibulectomy [6]. According to reports, paramedian mandibulotomy offers a significant advantage by reducing the risk of alveolar bone resorption and tooth loosening. This advantage is attributed to the presence of thicker interdental bone septa [7]. In Castagnola and colleagues' current study, segmental mandibulectomy and paramedian mandibulotomy were performed in 4 and 10 patients, respectively [1]. However, it is noteworthy to consider a confounding factor in the present investigation: specifically, 75% (3 out of 4 patients) in the segmental mandibulectomy group and 63.6% (7 out of 11 patients) in the paramedian mandibulotomy group also received adjuvant RT. Hence, considering the coexistence of RT as a confounding factor in most patients, it becomes difficult to solely attribute all adverse outcomes observed in sensitivity pulping tests to the specific surgical procedure selected. Previous studies have documented evidence supporting the development of notable vascular occlusion in teeth subjected to RT. It has been observed that a radiation dose as low as 2 Gy can seriously damage tiny capillaries, leading to ischemia, a subsequent decline in pulpal blood flow, and a significant decrease in the elimination of toxic metabolites that induce inflammation and aggravate occlusive hypoxia in the affected area [8, 9]. Unfortunately, the current study did not include detailed dose-volume information regarding the RT dosage received by the specific jaw volumes and the volume of the teeth at the margins of the osteotomy. Given that minimally invasive surgical procedures such as paramedian mandibulotomy were preferred in the majority of patients, it is difficult to determine whether the necrotic process of the teeth was caused solely by the surgical intervention, the destructive effects of RT on the vascular structures, or a cumulative function of both. Hence, it may be inappropriate to assert that dental necrosis is a prevalent complication following mandibulectomy and mandibulotomy in all scenarios. Additionally, proposing preoperative root canal treatment for the teeth in the vicinity of the surgical site as a viable strategy to reduce postoperative complications may not be warranted for every patient undergoing mandibular surgery, especially if adjuvant RT is not indicated. Therefore it may be more appropriate to decide the actual need for root-canal treatment after the final pathological examination results become available, which will determine whether adjuvant RT is indicated. To address these issues, we contend that conducting appropriately designed multicenter large-scale randomized trials that examine the surgical technique and the RT usage status could yield valuable insights into this issue of utmost significance.

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Competing interests
The authors declare no competing interests.

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