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Management Strategies for Osteoradionecrosis of the Jaw: A Clinical Review.

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Introduction

Osteoradionecrosis (ORN) of the jaw is a severe, debilitating complication that can arise following radiotherapy for head and neck cancers. Characterized by persistent bone exposure and necrosis in previously irradiated areas, ORN is often resistant to conventional wound healing processes due to compromised vascularity, fibrosis, and hypoxia of the affected bone tissue. The mandible is particularly susceptible because of its relatively limited blood supply compared to the maxilla and its proximity to high-dose radiation fields during oncologic treatment.

Radiotherapy, while essential in improving cancer control and survival, inadvertently damages healthy bone and surrounding soft tissues. This leads to chronic inflammation, reduced osteoblastic activity, and impaired angiogenesis, all of which increase susceptibility to necrosis. Risk factors for ORN include high radiation dose, poor oral hygiene, invasive dental procedures post-radiotherapy, tobacco and alcohol use, and systemic comorbidities such as diabetes [1, 2, 3, 4, 5].

Management of ORN requires a multidisciplinary approach involving oral and maxillofacial surgeons, oncologists, prosthodontists, and hyperbaric medicine specialists. Treatment modalities vary based on severity, ranging from conservative management—such as antiseptic mouth rinses, antibiotics, and analgesics—to more advanced interventions including hyperbaric oxygen therapy (HBOT), low-intensity laser therapy, pharmacological agents like pentoxifylline and tocopherol, and surgical resection with reconstruction. Early diagnosis and preventive strategies, such as pre-radiotherapy dental assessments and minimally invasive surgical techniques, are critical in minimizing morbidity and improving patient outcomes.

Conclusion

Osteoradionecrosis of the jaw remains a challenging complication in head and neck cancer survivorship, with significant implications for patient quality of life. Effective management depends on early recognition, comprehensive preventive care, and individualized treatment plans tailored to the stage and severity of the disease. While conservative measures may suffice in early cases, advanced stages often necessitate surgical intervention supported by adjunctive therapies. Future research should focus on refining risk assessment protocols, optimizing combination therapies, and exploring novel regenerative approaches to enhance bone healing in irradiated tissues. An integrated, multidisciplinary approach is paramount for achieving the best possible clinical outcomes in patients affected by this condition.

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