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abstract

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abstract

Clinical Analysis of Contralateral Oral Mucosal Sparing Radiotherapy in Head and Neck Cancer With Rapid Arc Technique: Randomized Control Study

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Introduction: Head and neck cancers (HNC), particularly squamous cell carcinomas of the oral cavity, often require high-dose radiotherapy as a cornerstone of curative treatment. However, radiation-induced oral mucositis (RIOM) is a common and debilitating toxicity that affects patient compliance, nutritional status, and quality of life. Volumetric Modulated Arc Therapy (VMAT) with RapidArc offers opportunities for advanced dose modulation, enabling sparing of non-involved contralateral oral mucosa (OM) without compromising tumor coverage. The objective of this study is to evaluate the clinical impact of contralateral OM sparing using RapidArc in patients with lateralized oral cavity cancers, specifically assessing the incidence, severity, and timeline of oral mucositis, as well as treatment outcomes

Methodology: A prospective study was conducted involving 80 patients with histologically confirmed lateralized head and neck squamous cell carcinoma (HNSCC) undergoing curative-intent

radiotherapy. Patients were divided into two arms: OM-sparing (n=40) and non-sparing (n=40). All patients received 66 Gy in 33 fractions using RapidArc, with or without concurrent chemotherapy. Weekly assessments were performed for mucositis grading (per CTCAE v5.0), treatment tolerance, and response at 6 weeks and 4 months post-RT. Dosimetric data including mean dose to OM, D_{mean} , V30, and V40 were analyzed.

Results: The mean contralateral OM dose was significantly lower in the sparing group (mean 33.4Gy) compared to the non-sparing group (mean 52.1 Gy). Grade 3 mucositis was observed in only 5% of OM-sparing patients, compared to 40% in the non-sparing arm ($p<0.001$). Treatment interruptions >3 days occurred in 5% of sparing patients versus 15% in the control group. Despite reduced toxicity, oncological outcomes were not compromised: complete response rates at 6 weeks and 4 months were comparable between arms ($p=0.47$ and $p=0.61$, respectively).

Conclusion: Contralateral OM sparing with RapidArc in well-selected HNSCC patients significantly reduces the severity of oral mucositis without impacting tumor control. This approach is clinically feasible, enhances patient tolerance to treatment, and should be considered a planning objective in radiotherapy protocols for lateralized head and neck tumors.

Conflict of interests: The authors declare no conflict of interests.

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