



ADJUVANT RADIATION THERAPY IN POST-OPERATIVE CARCINOMA BUCCAL MUCOSA CANCER: EVOLUTION OF SIDE EFFECTS AND THEIR MANAGERMENTS

Rajiv Kumar Singh	SCRTO Apex Hospital Dlw Hydell Road, Varanasi, Uttar Pradesh
Dr. Ankita Patel	Director Apex Hospital Dlw Hydell Road, Varanasi, Uttar Pradesh
Dr. Neha Gupta	HOD Apex Hospital Dlw Hydell Road, Varanasi, Uttar Pradesh
Dr. Gaurav Goswami	Senior Consultant Apex Hospital Dlw Hydell Road, Varanasi, Uttar Pradesh
Dr. Suboohi Jafar	Apex Hospital Dlw Hydell Road, Varanasi, Uttar Pradesh
Dr. Upendra Giri	CRSO Apex Hospital Dlw Hydell Road, Varanasi, Uttar Pradesh
Mr. Arnab Mahapatra	RSO Apex Hospital Dlw Hydell Road, Varanasi, Uttar Pradesh
Mr. Abu Saqib	Apex Hospital Dlw Hydell Road, Varanasi, Uttar Pradesh
Mr. Sudharshu Sekhar Rana	Apex Hospital Dlw Hydell Road, Varanasi, Uttar Pradesh
Ms. Manjulika Bhattacharjee	Apex Hospital Dlw Hydell Road, Varanasi, Uttar Pradesh

ABSTRACT

This article examines the management of radiation therapy in patients with buccal mucosa cancer. It focuses on common side effects associated with treatment, presents case studies of 35 patients, and discusses effective management strategies. Addressing these side effects is essential to improving patient quality of life during and after treatment.

KEYWORDS :

INTRODUCTION

Buccal mucosa cancer is a type of oral cancer that affects the inner lining of the cheeks. This cancer is often associated with several risk factors, including tobacco and alcohol use, and its incidence is rising in certain demographics. Radiation therapy plays a critical role in treating localized cases, providing significant tumor control while aiming to preserve surrounding healthy tissue.^[1]

Despite its effectiveness, radiation therapy can lead to various side effects that significantly impact patients' quality of life. This article aims to explore these side effects, drawing on the experiences of 35 patients, and to offer effective management strategies that healthcare providers can employ to improve patient outcomes.^[2]

Patient Demographics

This study analyzed 35 patients diagnosed with buccal mucosa cancer. The demographic data includes:

- **Age Range:** Patients ranged from 35 to 80 years, reflecting a diverse age group.
- **Sex:** There were 18 males and 17 females, indicating a relatively balanced gender distribution.
- **Ethnicity:** The patient cohort included individuals from various ethnic backgrounds, with a notable prevalence among those with a history of tobacco and alcohol use.
- **Cancer Staging:** Patients presented with varying stages of cancer, including early (Stage I) to advanced (Stage IV) stages, highlighting the diversity in treatment needs and outcomes.

Treatment Protocols

Radiation Techniques

Patients received radiation therapy primarily through:

- **Intensity-Modulated Radiation Therapy (IMRT):** This

advanced technique allows for precise targeting of the tumor, minimizing exposure to adjacent healthy tissues.

- **3D Conformal Radiation Therapy (3D-CRT):** Another effective method that shapes the radiation beams to match the tumor's shape, ensuring maximum dose delivery to the cancerous tissue.
- **Volumetric Modulated Arc Therapy (VMAT):** This is an advanced form of radiation therapy used to treat cancer. It allows for precise delivery of radiation by rotating the treatment machine around the patient in a continuous arc

Dosage and Schedule

The typical treatment regimen involved:

- **Total Dose:** Ranged from 60 to 70 Gy, depending on the tumor size and stage.
- **Fractionation:** Delivered in daily fractions over 6 to 7 weeks, allowing for a balance between treatment efficacy and the minimization of side effects.

Combination Therapies^{[8][9]}

In some cases, patients underwent concurrent chemotherapy or surgical interventions, depending on tumor staging and individual health conditions. This combination approach aimed to enhance treatment efficacy and improve survival rates.

Common Side Effects of Radiation Therapy^{[3][8][9][10]}

Oral Mucositis

Oral mucositis was a prevalent side effect, reported in 10 of the 15 patients. Symptoms included:

- Severe pain and inflammation of the oral mucosa.
- Difficulty eating and maintaining oral hygiene.
- Several patients required nutritional support and interventions such as pain management strategies (e.g., topical anesthetics).

Xerostomia (Dry Mouth)^[4]

Xerostomia affected all patients to varying degrees, leading to:

- Significant discomfort, difficulty swallowing, and increased risk of dental caries.
- Management strategies included the use of saliva substitutes, increased fluid intake, and regular dental check-ups.

Dysphagia (Difficulty Swallowing)^[5]

Dysphagia was noted in 8 patients, impacting their ability to consume solid foods. The consequences included:

- Weight loss and nutritional deficiencies.
- Dietary modifications were necessary, and some patients required enteral feeding to meet their nutritional needs.

Taste Alterations^[6]

Changes in taste perception were common, with many patients reporting:

- A metallic taste that affected appetite and meal enjoyment.
- Strategies to cope with taste changes included trying different flavors and textures of food.

Skin Reactions^[6]

Skin reactions such as erythema and dryness occurred in the irradiated areas, leading to:

- Discomfort and self-consciousness about appearance.
- Most patients managed these symptoms with topical treatments and moisturizers.

Detailed Case Studies**New Patients****Case Study 1**

Patient Profile: 60-year-old male, Stage III buccal mucosa cancer.

Treatment: IMRT, 70 Gy in 35 fractions.

Side Effects: Severe oral mucositis, grade 3 xerostomia.

Management: Nutritional support, topical anesthetics, and saliva substitutes were employed.

Outcomes: Significant improvement in quality of life post-treatment, with effective pain management leading to better oral intake.

Case Study 2

Patient Profile: 45-year-old female, Stage II cancer.

Treatment: 60 Gy in 30 fractions.

Side Effects: Moderate dysphagia, taste changes.

Management: Swallowing therapy and dietary modifications were introduced.

Outcomes: Improved swallowing function after intervention, allowing for a better nutritional status.

Case Study 3

Patient Profile: 55-year-old female, Stage II buccal mucosa cancer.

Treatment: 66 Gy in 33 fractions using IMRT.

Side Effects: Mild oral mucositis, grade 2 xerostomia.

Management: Antimicrobial mouth rinses and saliva substitutes were introduced. Nutritional counseling helped with dietary adjustments.

Outcomes: The patient reported manageable symptoms with effective oral care and maintained adequate nutrition throughout treatment.

Case Study 4

Patient Profile: 47-year-old male, Stage III buccal mucosa cancer.

Treatment: 70 Gy in 35 fractions with concurrent chemotherapy.

Side Effects: Severe dysphagia and oral mucositis.

Management: Enteral feeding was initiated due to severe

swallowing difficulties. Pain management included opioids and topical anesthetics.

Outcomes: After treatment, the patient showed improvement in swallowing ability with follow-up speech therapy.

Case Study 5

Patient Profile: 65-year-old female, Stage I buccal mucosa cancer.

Treatment: 60 Gy in 30 fractions.

Side Effects: Moderate xerostomia and taste alterations.

Management: Use of saliva stimulants and diet modifications to enhance flavor. The patient was encouraged to try different textures to maintain appetite.

Outcomes: The patient experienced gradual improvement in taste perception post-treatment and managed to maintain a balanced diet.

Case Study 6

Patient Profile: 50-year-old male, Stage IV buccal mucosa cancer.

Treatment: 72 Gy in 36 fractions with combination therapy (surgery followed by radiation).

Side Effects: Severe oral mucositis and skin reactions.

Management: Frequent oral care with saline rinses and topical treatments for skin care. Nutritional support was provided.

Outcomes: The patient successfully navigated treatment with improved oral health and reduced skin reactions by adhering to care protocols.

Case Study 7

Patient Profile: 38-year-old female, Stage II buccal mucosa cancer.

Treatment: 65 Gy in 33 fractions using 3D-CRT.

Side Effects: Mild dysphagia and fatigue.

Management: Encouraged small, frequent meals and rest periods throughout the day. Swallowing exercises were introduced by a speech therapist.

Outcomes: The patient maintained her weight and reported reduced fatigue with supportive measures.

Case Study 8

Patient Profile: 70-year-old male, Stage III buccal mucosa cancer.

Treatment: 68 Gy in 34 fractions with chemotherapy.

Side Effects: Severe xerostomia and taste disturbances.

Management: Salivary substitutes and taste enhancement strategies (spices and flavoring).

Outcomes: Significant improvement in comfort levels related to dry mouth, and the patient reported better enjoyment of food after adjusting flavors.

Case Study 9

Patient Profile: 62-year-old female, Stage I buccal mucosa cancer.

Treatment: 59 Gy in 29 fractions.

Side Effects: Mild oral mucositis and skin erythema.

Management: Regular skin care with emollients and gentle oral care routines.

Outcomes: The patient experienced minimal discomfort and effectively managed side effects with routine care.

Case Study 10

Patient Profile: 44-year-old male, Stage II buccal mucosa cancer.

Treatment: 64 Gy in 32 fractions.

Side Effects: Moderate dysphagia and xerostomia.

Management: Modified diet and saliva stimulants were utilized, along with swallowing therapy.

Outcomes: The patient showed improvement in swallowing and was able to return to a normal diet after completing treatment.

Case Study 11

Patient Profile: 58-year-old female, Stage III buccal mucosa cancer.

Treatment: 70 Gy in 35 fractions with chemotherapy.

Side Effects: Severe oral mucositis and weight loss.

Management: Nutritional support with enteral feeding and aggressive pain management strategies.

Outcomes: After treatment, the patient regained weight and reported improved oral comfort and health.

Case Study 12

Patient Profile: 49-year-old male, Stage II buccal mucosa cancer.

Treatment: 61 Gy in 30 fractions.

Side Effects: Mild dysphagia and taste changes.

Management: Incorporation of swallowing exercises and dietary modifications to enhance meal appeal.

Outcomes: The patient's swallowing improved, and he maintained adequate nutrition through tailored dietary adjustments.

Case Study 13

Patient Profile: 73-year-old female, Stage I buccal mucosa cancer.

Treatment: 55 Gy in 27 fractions.

Side Effects: Mild xerostomia and skin sensitivity.

Management: Regular skin care routines and the use of saliva substitutes were implemented.

Outcomes: The patient reported high satisfaction with her oral care regimen, and side effects were well-managed.

Case Study 14

Patient Profile: 61-year-old male, Stage IV buccal mucosa cancer.

Treatment: 74 Gy in 37 fractions with concurrent chemotherapy.

Side Effects: Severe dysphagia and fatigue.

Management: Frequent small meals, nutritional supplements, and rest periods were recommended.

Outcomes: The patient maintained a stable weight and reported improved energy levels towards the end of treatment.

Case Study 15

Patient Profile: 34-year-old female, Stage II buccal mucosa cancer.

Treatment: 67 Gy in 33 fractions using IMRT.

Side Effects: Moderate oral mucositis and taste disturbances.

Management: Oral care routines included saltwater rinses, and dietary adjustments focused on softer foods and flavor enhancement.

Outcomes: The patient reported significant improvement in oral comfort and managed to maintain a varied diet through treatment.

Case Study 16

Patient Profile: 60-year-old male, Stage II buccal mucosa cancer.

Treatment: VMAT delivering 66 Gy in 33 fractions.

Side Effects: Moderate oral mucositis and xerostomia.

Management: Patients were provided with oral care protocols, including saline rinses and topical anesthetics. Saliva substitutes were also recommended.

Outcomes: The patient reported manageable discomfort, with significant improvement in oral health by the end of treatment.

Case Study 17

Patient Profile: 50-year-old female, Stage III buccal mucosa cancer.

Treatment: VMAT delivering 70 Gy in 35 fractions with concurrent chemotherapy.

Side Effects: Severe dysphagia and taste alterations.

Management: Nutritional support was initiated with enteral

feeding due to severe swallowing difficulties. The patient also participated in swallowing therapy post-treatment.

Outcomes: Improved swallowing ability and taste perception were noted after completing treatment, allowing the patient to gradually return to a normal diet.

Case Study 18

Patient Profile: 42-year-old male, Stage I buccal mucosa cancer.

Treatment: VMAT delivering 60 Gy in 30 fractions.

Side Effects: Mild xerostomia and skin reactions.

Management: Regular skin care routines were implemented, and saliva substitutes were recommended to manage dry mouth.

Outcomes: The patient experienced minimal side effects and reported high satisfaction with both skin care and oral health management.

Case Study 19

Patient Profile: 68-year-old female, Stage IV buccal mucosa cancer.

Treatment: VMAT delivering 72 Gy in 36 fractions with concurrent chemotherapy.

Side Effects: Severe oral mucositis and fatigue.

Management: Aggressive pain management included opioids and topical treatments for mucositis. Nutritional supplements were provided to ensure adequate caloric intake.

Outcomes: The patient managed to stabilize weight during treatment and reported improved energy levels towards the end.

Case Study 20

Patient Profile: 55-year-old male, Stage II buccal mucosa cancer.

Treatment: VMAT delivering 65 Gy in 33 fractions.

Side Effects: Moderate dysphagia and xerostomia.

Management: The patient received swallowing therapy and was encouraged to consume a modified diet with softer foods. Saliva substitutes were also recommended.

Outcomes: Improvement in swallowing function and reduction in dry mouth symptoms were reported, enhancing the patient's quality of life post-treatment.

Addaptive Radiotherapy Patients :**Case Study 21**

Patient Profile: 58-year-old male, Stage II buccal mucosa cancer.

Initial Treatment: VMAT delivering 66 Gy in 33 fractions.

Re-scan Timing: 10 days post-treatment initiation.

Findings: Mild edema in the irradiated area, no evidence of acute complications.

Management: Continued monitoring; supportive care measures were reinforced, including pain management and nutritional support.

Case Study 22

Patient Profile: 65-year-old female, Stage III buccal mucosa cancer.

Initial Treatment: VMAT delivering 70 Gy in 35 fractions with concurrent chemotherapy.

Re-scan Timing: 15 days post-treatment initiation.

Findings: Significant mucositis noted, with moderate thickening of the surrounding soft tissues.

Management: Adjusted pain management protocol to include stronger analgesics. Nutritional counseling was intensified to address dysphagia.

Case Study 23

Patient Profile: 72-year-old male, Stage I buccal mucosa cancer.

Initial Treatment: VMAT delivering 60 Gy in 30 fractions.

Re-scan Timing: 10 days post-treatment initiation.

Findings: No acute complications; baseline soft tissue condition maintained.

Management: Reassured patient about the absence of complications, continued regular oral care and monitoring.

Case Study 24

Patient Profile: 50-year-old female, Stage IV buccal mucosa cancer.

Initial Treatment: VMAT delivering 72 Gy in 36 fractions with concurrent chemotherapy.

Re-scan Timing: 15 days post-treatment initiation.

Findings: Evidence of moderate mucositis and initial signs of infection in the oral cavity.

Management: Initiated antibiotic therapy and intensified oral hygiene protocols. Dietary modifications were also implemented.

Case Study 25

Patient Profile: 44-year-old male, Stage II buccal mucosa cancer.

Initial Treatment: VMAT delivering 65 Gy in 33 fractions.

Re-scan Timing: 10 days post-treatment initiation.

Findings: Mild mucosal inflammation without significant changes in soft tissue density.

Management: Continued oral care regimen; monitored for any changes and provided additional pain management as needed.

Case Study 26

Patient Profile: 60-year-old female, Stage III buccal mucosa cancer.

Initial Treatment: VMAT delivering 68 Gy in 34 fractions.

Re-scan Timing: 15 days post-treatment initiation.

Findings: Notable development of severe oral mucositis, significant weight loss observed.

Management: Implemented enteral nutrition support and enhanced pain control measures. Close follow-up was scheduled for symptom management.

Case Study 27

Patient Profile: 53-year-old male, Stage II buccal mucosa cancer.

Initial Treatment: VMAT delivering 67 Gy in 33 fractions.

Re-scan Timing: 10 days post-treatment initiation.

Findings: Stable condition, slight increase in soft tissue density indicative of early inflammatory changes.

Management: Maintained supportive care and provided reassurance; scheduled follow-up for monitoring.

Case Study 28

Patient Profile: 75-year-old female, Stage I buccal mucosa cancer.

Initial Treatment: VMAT delivering 59 Gy in 27 fractions.

Re-scan Timing: 15 days post-treatment initiation.

Findings: No significant changes; healing progressing well without complications.

Management: Continued with routine oral care and encouraged regular follow-ups to maintain progress.

Case Study 29

Patient Profile: 62-year-old male, Stage III buccal mucosa cancer.

Initial Treatment: VMAT delivering 70 Gy in 35 fractions with concurrent chemotherapy.

Re-scan Timing: 10 days post-treatment initiation.

Findings: Severe oral mucositis, significant pain reported.

Management: Aggressive pain management and consideration for possible dose adjustments in further treatments.

Case Study 30

Patient Profile: 48-year-old female, Stage II buccal mucosa cancer.

Initial Treatment: VMAT delivering 64 Gy in 32 fractions.

Re-scan Timing: 15 days post-treatment initiation.

Findings: Mild mucositis, early signs of xerostomia.

Management: Initiated saliva substitutes and reinforced oral hygiene education. Scheduled follow-up for further evaluation of symptoms.

Weight Loss Patients:

Case Study 31

Patient Profile: 62-year-old male, Stage III buccal mucosa cancer.

Initial Treatment: VMAT delivering 70 Gy in 35 fractions with concurrent chemotherapy.

Weight Loss: The patient experienced a 10% loss of body weight within the first month of treatment.

Seroma Formation: Notable seroma formation in the neck region following surgery.

Management: Nutritional support was provided, including a high-calorie, protein-rich diet. The seroma was monitored, and aspiration was performed twice to relieve discomfort.

Outcomes: The patient regained weight gradually, and seroma resolved with continued monitoring and care.

Case Study 32

Patient Profile: 55-year-old female, Stage IV buccal mucosa cancer.

Initial Treatment: VMAT delivering 72 Gy in 36 fractions.

Weight Loss: Experienced a 15% weight loss during the first two weeks due to severe dysphagia and oral mucositis.

Seroma Formation: Developed a seroma in the left submandibular region post-surgery.

Management: Enteral feeding was initiated to ensure nutritional intake. The seroma was managed with compression and aspiration as needed.

Outcomes: The patient stabilized her weight and reported improvement in her swallowing function after intervention.

Case Study 33

Patient Profile: 48-year-old male, Stage II buccal mucosa cancer.

Initial Treatment: VMAT delivering 65 Gy in 33 fractions.

Weight Loss: Experienced a 12% decrease in body weight within four weeks due to difficulties with food intake.

Seroma Formation: Developed seroma at the surgical site following neck dissection.

Management: Nutritional counseling was provided, and the seroma was monitored with periodic aspirations. The patient was encouraged to consume smaller, more frequent meals.

Outcomes: Weight stabilized after nutritional support, and the seroma was resolved after several aspirations.

Case Study 34

Patient Profile: 70-year-old female, Stage I buccal mucosa cancer.

Initial Treatment: VMAT delivering 60 Gy in 30 fractions.

Weight Loss: Noted a 10% weight loss due to mild dysphagia and changes in taste perception.

Seroma Formation: No significant seroma observed; mild localized swelling at the surgery site.

Management: Emphasis on maintaining hydration and nutritional intake; no intervention for seroma needed.

Outcomes: Weight loss was addressed with diet adjustments, and the patient maintained stable health throughout treatment.

Case Study 35

Patient Profile: 65-year-old male, Stage III buccal mucosa cancer.

Initial Treatment: VMAT delivering 68 Gy in 34 fractions with concurrent chemotherapy.

Weight Loss: Experienced a 20% weight loss over six weeks due to severe oral mucositis and anorexia.

Seroma Formation: Developed a seroma in the right neck region after surgery.

Management: Initiated enteral nutrition and addressed the seroma with aspiration and compression dressings. Pain management was enhanced to improve oral intake.

Outcomes: The patient gradually regained weight and the seroma resolved with continued care.

Solutions to Mitigate Side Effects^{[6][7]}

Oral Care Protocols

Maintaining oral hygiene is essential for preventing complications. Recommended protocols include:

- Use of antimicrobial mouth rinses to reduce the risk of infections.
- Regular dental check-ups and cleanings during treatment to monitor oral health.

Nutritional Support

Dietary recommendations for patients experiencing side effects include:

- High-calorie, soft diets to facilitate easier swallowing and nutrition.
- Nutritional supplements as necessary to ensure adequate caloric intake.

Pain Management

Effective pain management strategies involve:

- Topical analgesics for localized pain relief in cases of oral mucositis.
- Systemic pain relief options, such as opioids or NSAIDs, for more severe pain.

Salivary Substitutes And Stimulants

Saliva substitutes and medications like pilocarpine can significantly alleviate symptoms of xerostomia, improving comfort and oral function.

Rehabilitation And Support Services

A multidisciplinary approach, including speech therapy and psychological support, is crucial for comprehensive patient care. This approach addresses the physical and emotional aspects of treatment, enhancing overall patient well-being.

CONCLUSION

Managing the side effects of radiation therapy in buccal mucosa cancer is vital for improving patient quality of life. A holistic, multidisciplinary approach that involves ongoing support and education can lead to better outcomes and enhanced patient satisfaction. Continued research and adaptation of management strategies based on patient feedback will further enhance care for individuals undergoing treatment.

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