COMPARISON OF DENTAL HEALTH OF HEAD AND NECK CANCER PATIENTS RECEIVING IMRT VERSUS CONVENTIONAL RADIATION THERAPY

Victor M. Duarte, MD[1,3], Sassan Rafizadeh, PhD,[4] Tracey Tajima, DDS[2,3], Vishad Nabili, MD[1,3], Marilene B. Wang, MD[1,3]

[1]Division of Head and Neck Surgery, David Geffen School of Medicine at UCLA
[2]Department of Oral Medicine, School of Dentistry at UCLA
[3]West Los Angeles Veterans Affairs Hospital, Los Angeles, CA
[4]University of Toledo College of Medicine, Toledo, OH

Objectives: *To analyze the dental health of head and neck cancer patients who received comprehensive dental care before and after radiation.*

Study Design: *Retrospective study*

Methods: *282 Head and neck cancer patients at a single VA hospital who were treated with radiation between 2000 and 2010 were identified. All patients received conventional RT (Radiation Therapy) or IMRT (Intense Modulated Radiation Therapy).*

Results: *A complete dental evaluation was performed prior to radiation treatment, including periodontal probing, tooth profile, cavity check, and mobility. The dental treatment plan was formulated to eliminate current and potential dental disease, as well as preparing for possible future dental rehabilitation. Fluoride trays were done to minimize caries in remaining teeth. The rates of dental extractions, infections, and caries were analyzed and a comparison was made between patients with head and neck cancer treated with IMRT and those treated with conventional RT. The number of post-treatment extractions has been reduced with the advent of IMRT, and significantly more so with a complete dental evaluation prior to treatment. The rate of radiation caries was found to be less in patients treated with IMRT. In addition, radiation caries rate was reduced by the daily use of fluoride treatment in both groups who received RT and IMRT. Patients with more saliva were able to tolerate the prosthesis and dentures after treatment better than those with increased dryness and decreased saliva.*

Conclusion: *Head and neck cancer patients who had IMRT had significantly less radiation caries and more salivary flow, and less requisite post-treatment extractions compared to those patients with conventional RT.*

CONTACT

Victor M. Duarte, M.D.
UCLA Head and Heck Surgery
vduarte@mednet.ucla.edu

Poster Design & Printing by Genigraphics® - 800.790.4001

INTRODUCTION

Each year, approximately 500,000 new cases of head and neck cancer are diagnosed worldwide.[1]

Radiation Therapy (RT) plays an important role in management in treatment of head and neck cancer; however it can be associated with several undesired reactions.

Frequently, the salivary glands, oral cavity and mandible are included in radiation field.[1]

Changes induced by exposure to radiation to these sites may occur during and after completion of therapy, leading to poor dental hygiene and infection.

The precise incidence and prevalence of RT-induced side effects and sequelae especially in dental health is not readily available.[1]

Our goal was to examine the dental health of head and neck cancer patients after IMRT (intensity-modulated radiation therapy) compared to conventional radiation treatment to determine the progression of disease and best dental treatment practices.

METHODS

A retrospective study was performed by reviewing the charts of 115 VA tumor board patients with malignancy of the head and neck treated with radiation between 2003 and 2011.

All patients met with the dental team prior to radiation. Patients who were seen during and after treatment were patients who required further dental treatment.

The patient's dental treatment plan was developed upon referral by head and neck surgeons and radiotherapists before RT. Patients receive comprehensive treatment by a team composed of dentists.

Prior to RT, a complete dental evaluation was performed, including periodontal probing, tooth profile, cavity check, and mobility.

After the start of RT, the rates of candida, caries, mucositis, xerostomia, periodontitis, edentulous, extractions, fractures, ORN, use of fluoride trays was recorded, and a comparison was made between patients with head and neck cancer treated with IMRT and those treated with conventional RT.

The dental treatment plan was formulated to eliminate current and potential dental disease, as well as preparing for possible future dental rehabilitation.

FIGURE 1

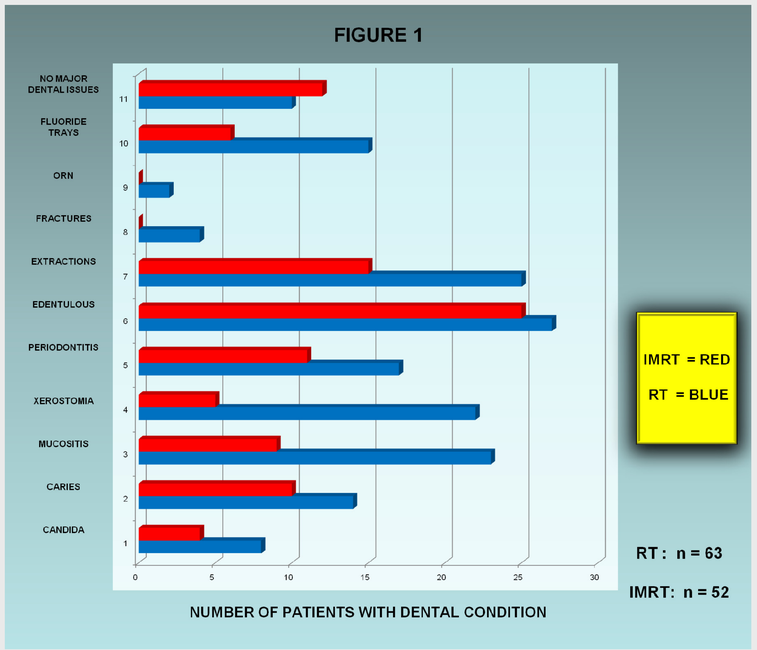
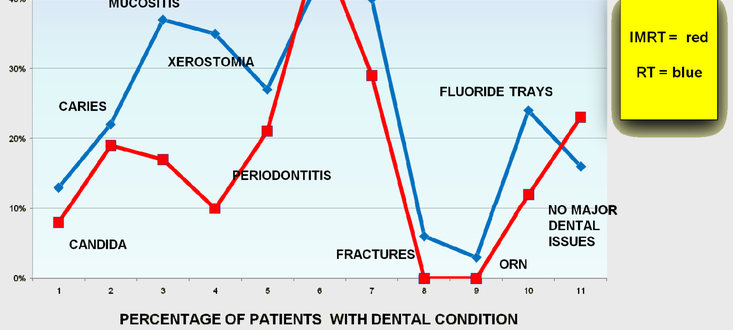


FIGURE 2



RESULTS

Number of patients in study: 115 (114 Males, 1 Female)
Number of RT treated patients: 63
Number of IMRT treated patients: 52
Age range of patients: 24-91
Radiation dose to primary site ranged from 37-80 Gy

Rates for RT and IMRT group (Table 1):

	RT GROUP	IMRT GROUP
TOTAL PATIENTS	63	52
DENTAL CONDITION		
CANDIDA	8	4
CARIES	14	10
MUCOSITIS	23	9
XEROSTOMIA	22	5
PERIODONTITIS	17	11
EDENTULOUS	27	25
EXTRACTIONS	25	15
FRACTURES	4	0
ORN	2	0
USE OF FLUORIDE TRAYS	15	6
NO MAJOR DENTAL ISSUES	10	12
CANDIDA	13%	8%
CARIES	22%	19%
MUCOSITIS	37%	17%
XEROSTOMIA	35%	10%
PERIODONTITIS	27%	21%
EDENTULOUS	43%	48%
EXTRACTIONS	40%	29%
FRACTURES	6%	0%
ORN	3%	0%
USE OF FLUORIDE TRAYS	24%	12%
NO MAJOR ISSUES	16%	23%

DISCUSSION

Previous studies have shown that between 68% and 97% of the patients examined just before RT need immediate dental care.[1]

Xerostomia is the most common oral sequelae from RT.[1]

The rate of radiation caries was found to be slightly less in patients treated with IMRT when compared to the RT treated patients (see Figure 1,2, Table 1).

The use of fluoride treatment reduces the likelihood of developing caries in patients receiving radiation.

In addition, the rate of mucositis, xerostomia, and periodontitis was less in the IMRT group.

The number of dental extractions at anytime during treatment (either before RT or IMRT, during, or after radiation) has been reduced with the advent of IMRT, and significantly more so with a complete dental evaluation prior to treatment.

Patients with dental extractions prior to RT rarely required follow up by the dental team. Less dental issues were seen in patients who had pre-treatment extraction.

Data from these patients was gathered on a review of a brief note from the RT team regarding their status during, and or, immediately after RT.

In the future, we plan to do a prospective study evaluating dental health during and after treatment. One key issue is the ability to get the patients in for dental follow-up during or after RT.

To get real time data of the dental status of the patients, a monthly schedule will need to be set up to allow the patients to come in for screening.

A multidisciplinary team approach in the management of these patients minimizes post-treatment dental complications and improves the overall quality of patient care.

CONCLUSIONS

Head and neck cancer patients who had IMRT had less radiation caries and more salivary flow, and less requisite treatment extractions compared to those patients with conventional RT.

REFERENCE

1. Jham BC, Reis PM, Miranda EL, Lopes RC, Carvalho AL, Scheper MA, Freire AR. Oral Health Status of 207 Head and Neck Cancer Patients Before, During and after Radiotherapy. Clin Oral Invest, 2008. 12: 19-24.