Effectiveness of fluoride varnish application as cariostatic and desensitizing agent in irradiated head and neck cancer patients

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INTRODUCTION

Radiation caries (RC) is highly destructive lesion with rapid onset, progression and non specific localization. Main risk factor being radiation induced xerostomia.

- **An ideal approach to prevent RC:**
  - **Quantitative modification of saliva:**

    By excluding major and minor salivary glands from irradiation field.
  - **Qualitative modification of saliva:**

    Topical fluorides which buffers ph of saliva, reduces oral cariogenic flora & remineralizes tooth structure.

- **For high risk patients (ADA Recommendation) :**
  - **Fluoride varnish should be applied 2-4 times per year.**
  - **The fluoride varnish has been found to be effective in preventing caries in high risk patients.**

- **Protocol for FVA at TMH:**

  Thorough oral prophylaxis, followed by application of slow release alcohol based topical 5% NaF varnish is done pre-radiation and at six month follow up.

OBJECTIVES

- To study the effect of fluoride varnish application on RC in HNC patients.
- To study the effect of fluoride varnish application on dental sensitivity in HNC patients.
- To assess the compliance of patients to three monthly fluoride varnish application (FVA).

MATERIALS AND METHODS

- 190 patients (138 males & 52 females) were randomly selected and reviewed.
- Patient's demographics, tumor location, staging, histopathology, radiation dosage and surgery were recorded.
- The patients were divided into three groups depending on their radiation dose namely Group 1: < 50Gy, Group 2: 50-60Gy and Group 3: >60Gy.
- Pre-radiotherapy and follow up decayed missing filled teeth index (DMFT), dental sensitivity, compliance to three monthly FVA was recorded till 15 months follow up.
- Statistical calculations were performed by using Mann Whitney U test or Kruskal Wallis test (as appropriate) for continuous variables and Chi-square test or Fisher's exact test for categorical variables.

RESULTS

Tumor site

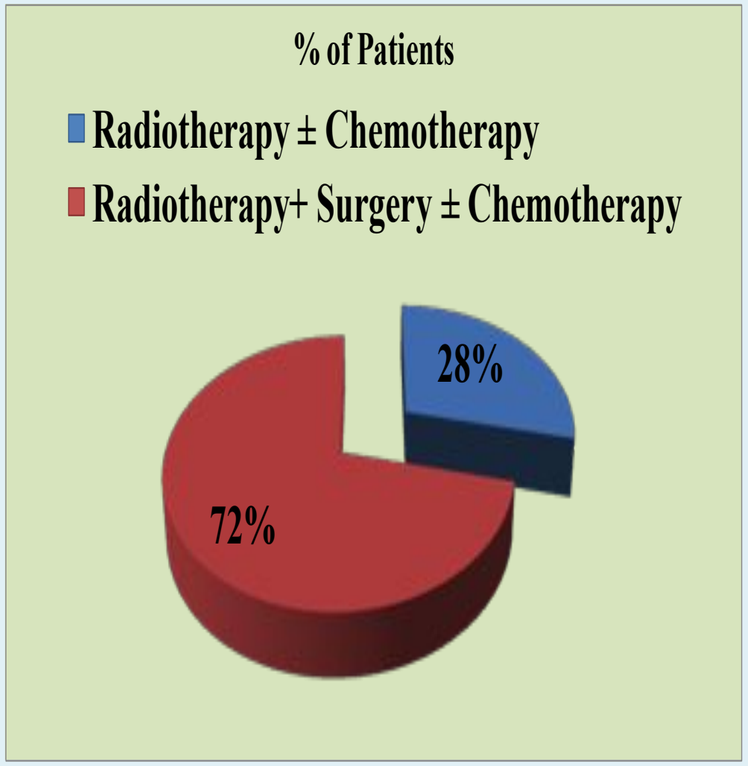
Site of primary tumor	No. of patients
Oral cavity	108
Oropharynx	35
Salivary glands	12
Para nasal sinus	20
Others (Larynx, Nasopharynx, Unknown primary)	33

Histopathology

Type of primary tumor	No.
Squamous cell carcinoma	156
Salivary gland tumor	15
Undifferentiated carcinoma	04
Others	15

RESULTS

Treatment



Radiation Dose	No. of patients
Group 1: < 50Gy	10
Group 2: 50-60Gy	95
Group 3: >60Gy	36
Radiation dose not known	49

DMFT index

	Before RT	3 Months	6 Months	9 Months	12 Months	15 Months
Mean	4.12	4.28	4.46	4.83	5.04	5.14
SD	4.35	4.42	4.85	5.15	5.31	5.36
Max.	32	32	32	32	32	32
Min.	0	0	0	0	0	0
p value		*.188*	*.725*	*.028*	*.003*	*.002*

DMFT across the study period with respect to:

Sex & Surgery — Statistically not significant *(p = .952, .107).*

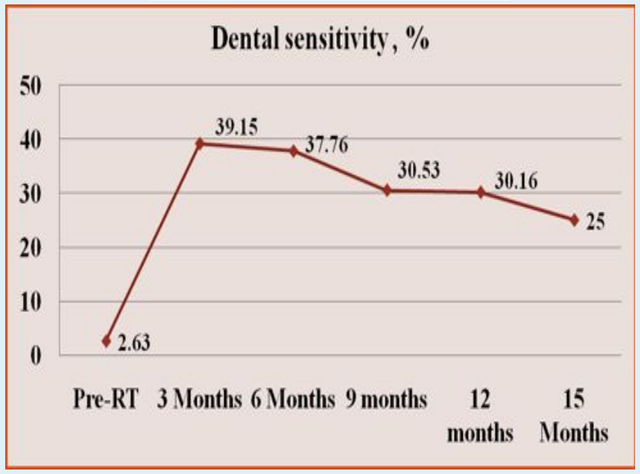
Site of disease & Radiation dose — Statistically significant *(p = .038, .015).*

Radiation caries

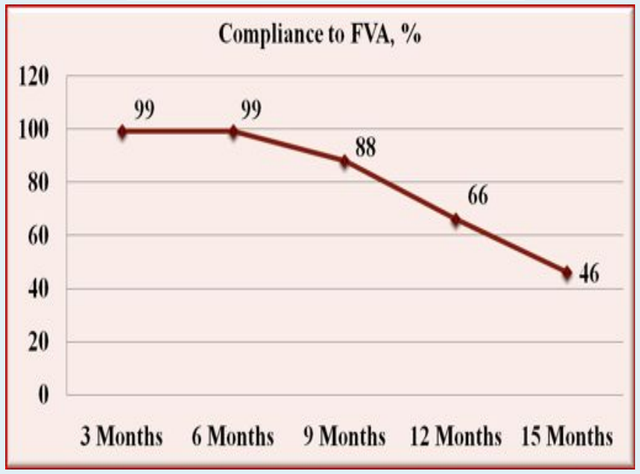
Caries incremental rate

- Pre-radiotherapy to six months- 1.34/month (8.02%)
- Six months to fifteen months – 1.71/month (15.35%)
- Pre-radiotherapy to fifteen months - 1.64/month (24.6%).

Dental Sensitivity



Compliance to FVA



CONCLUSION

- Radiation caries is the late effect of radiotherapy.
- Three monthly FVA helps in decreasing the incidence of RC.
- It also helps in decreasing the radiation induced dental sensitivity.
- Effective alternative to daily fluoride gel application
- Though compliance with 3 monthly FVA is good, there is still a need to educate and reinforce these patients about need of FVA.