



Head and Neck-Profile of Patients Undergoing Radiotherapy

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Introduction: Squamous cell carcinoma of Head and Neck is the commonest cancer globally WHO-2018. Worldwide it accounts for more than 9,00,000 new cases annually and 4,00,000 almost 50% deaths. It accounts about 3.5% cases of all cancer cases in United states and 14600 deaths. According to GLOBOCAN 2020, data about 13.24 million new cancer cases in which head and neck is commonest cancer among men and 4th common cancer in females in India. Oral Cancers contributed about 25% of all cancer related death in both sexes.

Material and Method: A retro specific analysis of patients who received radiotherapy in the department of State Cancer Institute, IGIMS Patna from March 2022 to March 2023. A total of 396 patients were included in this study. All locally advanced cases and operated cases were analyzed according to their age, sex, stage, histopathology and type of treatment received.

Discussion: In India nearly 200000 cases of head and neck cancer reported per year and associated with high morbidity like breathing difficulty, swallowing difficulty, speech, hearing, taste, smell and vision problem. Commonest symptoms were ulceration/swelling in tongue and buccal mucosa followed by dysphagia and change of voice depending upon area of involvement. Most common site in our study was Carcinoma Tongue. In our study about 81% patients were treated with curative treatment about 58% patient were treated with chemotherapy and radiotherapy.

Conclusion: Head and neck cancer is the commonest cancer in males in India. Our study shown middle aged male predominance due to tobacco chewing; commonest habit in our area. Oral cavity cancers were commonest in our analysis with Carcinoma Tongue commonly reported subsite. Patients usually presented in advanced stage with low general condition due to swallowing difficulty and pain during swallowing.

Keywords: Head and Neck; Patients; Radiotherapy

Introduction

Squamous cell carcinoma of Head and Neck is the commonest cancer globally [1] WHO-2018. Worldwide it accounts for more than 9,00,000 new cases annually and 4,00,000 almost 50% deaths [2]. It accounts about 3.5% cases of all cancer cases in United states and 14600 death [3]. According to Globacon 2020, data about 13.24 million new cancer cases in which head and neck is commonest cancer among men and 4th common cancer in females in India [4]. By 2030, the prediction is head and neck cases incidence will increase by 30%. [5]. Oral Cancers contributed about 25% of all cancer related death in both sexes [6].

In India among male's oral cavity cancer is most common cancer as reported by most population-based cancer registry [7]. Habit of alcohol and tobacco are considered most common etiological factor for carcinoma oral cavity, oropharynx, hypopharynx, and Laryngeal area. Human papilloma virus infection is also considered as a risk factor for squamous cell carcinoma head and neck [8]. Chronic exposure of these carcinogens can lead to premalignant condition and ultimately resulted into carcinoma [9]. Prevalence of the etiological factors cause different incidence rate in different areas of the world [9]. In developed and developing countries the incidence

of head and neck cancers are rising 10]. In Southeast Asia and Asia pacific region high incidence of oral cancers due to habit of chewing areca nut (betel grid) with or without addition of tobacco [11]. In USA and UK there is increased incidence reported of oropharyngeal cancer due to prevalence of human papilloma virus infections. Worldwide incidence of Laryngeal cancers reported 23% increase over ten years' time due to changing habits of smoking and alcohol intake [12-14]. Head and neck incidence shown male preponderance about two to four times more common in males than females about 20 per 100000 populations [15].

More than half million cases of head and neck cancer reported annually oral cavity, pharyngeal and Laryngeal carcinoma represent about 90% of head and neck squamous cell carcinoma [16,17]. The surveillance epidemiology and end result (SEER) data in United States consider radiotherapy. Radiotherapy responses clinical and functional outcome for cancer patients [18-20].

Risk factors

About 72% of head and neck cancer are caused by smoking and alcohol either separately or in combination [21]. Association and magnitude of these risk factor may vary with different sites of head and neck cancer like tobacco smoking in more responsible for Laryngeal cancer and oral cavity and oropharynx, alcohol is more responsible for cancer [22]. Some minor risk factors like inactivity and dietary habits, lifestyle and oral hygiene are considered as relatively minor risk factors. High risk factors specially HPV type 16 is considered as a major risk factor for oropharyngeal cancer [23].

Material and Method

A retro specific analysis of patients who received radiotherapy in the department of State Cancer Institute, IGIMS Patna from March 2022 to March 2023. A total of 396 patients were included in this study. All locally advanced cases and operated cases were analyzed according to their age, sex, stage, histopathology and type of treatment received.

Age Group	Male	Female
<20	4	1
21-30	17	8
31-40	68	6
41-50	89	12
51-60	75	23
61-70	66	19
71-80	28	5
>80	11	3
Total	324	72

Table 1: Distribution of Patients according to age group and sex.

Stages	No. of patients
Stage I	25
Stage II	80
Stage III	160
Stage IV	170

Table 2: Distribution of total number of Patients according to Stages of Cancer.

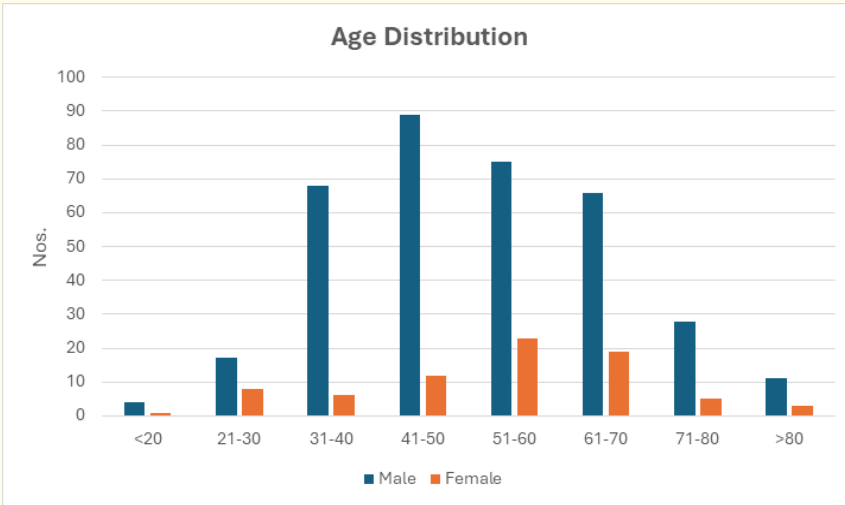


Figure 1: Distribution of Patients according to age group and sex.

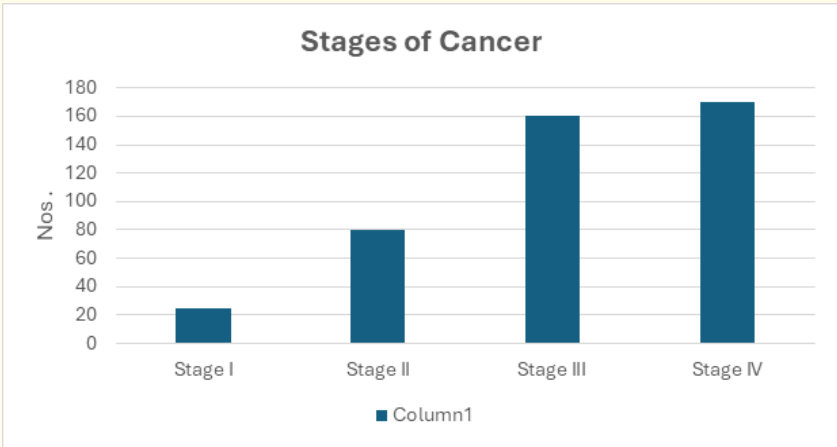


Figure 2: Distribution of total number of Patients according to Stages of Cancer.

Patient Characteristics	
Mean age	45 years
Male	324
Female	72
Disease:	
Oral Cavity	189
Buccal Mucosa	132
Tongue	144
Floor of Mouth	2
Hard Palate	4
Lower Alveolus	64
Soft Palate + Tonsil	13
Floor of Mouth	6
Retro Molar Trigone	5

Glottis + Supraglottic	57
Oropharynx + Hypopharynx	11
Nasopharynx + Nasal Cavity	9
Parotid	12
Others: Central arch	10
Salivary Gland	5
Angle of Mouth	3

Table 3: Table of Patient Characteristics.

Male	Female	Total
324	72	396

Table 4: Treatment Plan of Total Patients.

Total 396 patients were included in this study. Male: Female ratio was 4.26:1 in our study. The Age ranges from 20 year to 85 years. The commonest age group was 51-60 years of age, followed by 41 to 50 years and 30-40 years. Commonest age group was 51-60 years in females, followed by 61-70 year. Tobacco addiction was reported in 304 patients while smoking was only in 81 patient. Habit of alcohol drinking reported in 38 patients. 23 patients reported with history of addiction of smoking, ganja, tobacco, chewing and alcohol intake 85.8% patients presented with history of any kind of addiction.

Amongst site of head and neck cancer Carcinoma Tongue was commonest site with 23%, 2nd commonest site was Buccal mucosa 21% followed by lower alveolus and Laryngeal area (9.8%). Commonest stage was stage III followed by Stage II. Among treatment schedule which was advised 66 Gy in 33 fractions with weekly chemotherapy Inj Cisplatin 40 mg/nm2 in 38% followed by 60 Gy in 30 fractions with weekly Inj Cisplatin in 29% 70 Gy in 35 fractions with weekly chemotherapy advised in 27% cases.

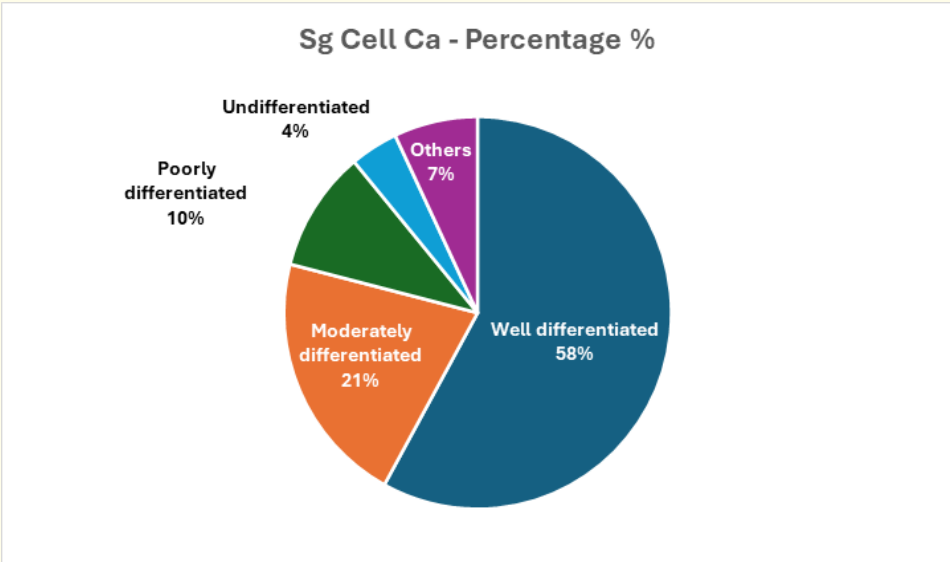


Figure 3: Distribution of Sg Cell Carcinoma.

Sg Cell Carcinoma	Percentage (%)
Well differentiated	58%
Moderately differentiated	21%
Poorly differentiated	10%
Undifferentiated	4%
Others	7%

Table 5: Pathological Distribution of Sg Cell carcinoma with percentage.

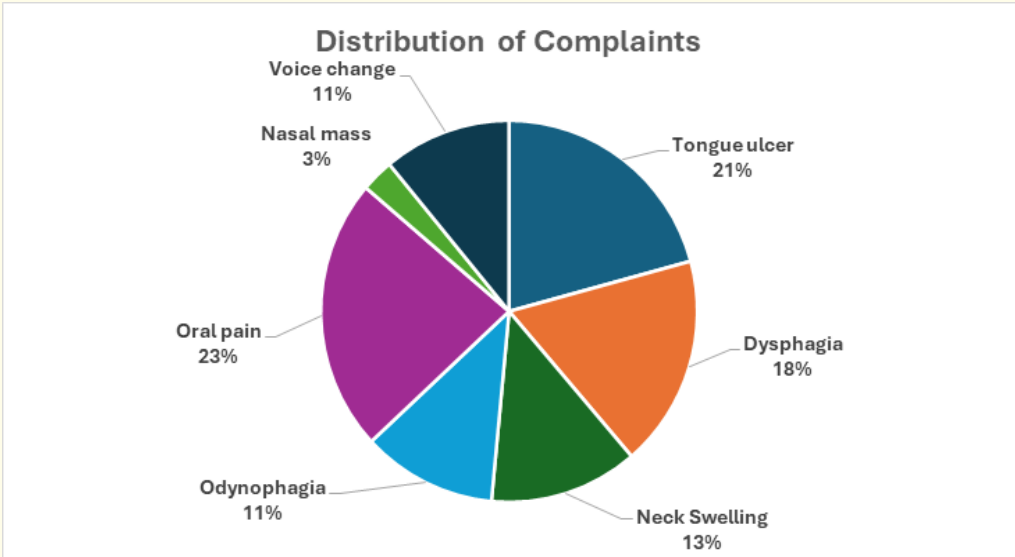


Figure 4: Graph of Distribution of Patients according to their complaints.

Chief Complaints	No. of patients	Percentage %
Tongue ulcer	104	20.76%
Dysphagia	90	17.96%
Neck Swelling	64	12.77%
Odynophagia	58	11.58%
Oral pain	116	23.15%
Nasal mass	14	2.79%
Voice change	55	10.98%

Table 6: Distribution of Patients according to their complaints.

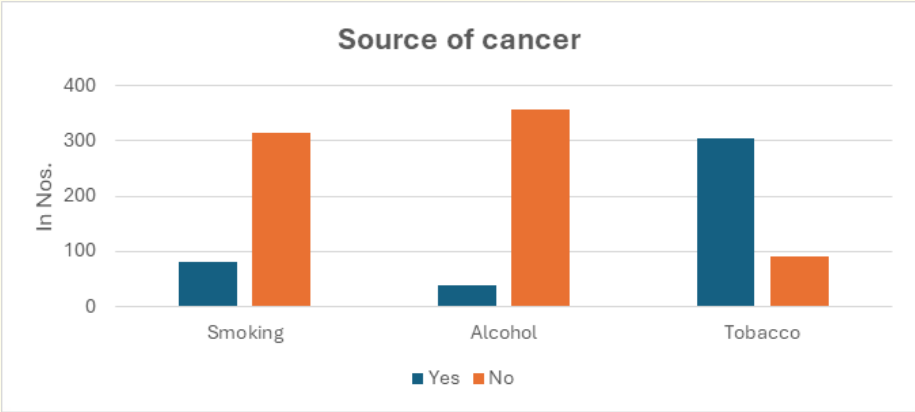


Figure 6: Distribution according to sources of Cancer.

Category	Yes	%	No	Years
Smoking	81	20.45%	315	15-25 years
Alcohol	38	9.60%	358	8-10 years
Tobacco	304	76.77%	92	12-28 years

Table 7: Distribution according to sources of Cancer.

Intent of therapy		%
Post Operated Cases		41%
Unoperated Cases		59%
Treatment Presented:		
Unoperated Cases		59%
	RT alone	5%
	CT+RT	16%
	Neo adjuvant CT+RT (Docetaxel + Cis-platin) (3-4 weeks)	28%
	Weekly nab Paclitaxel	3%
	Weekly Cisplatin	2%
	Docetaxel + Cisplatin	5%
Post operated cases		41%
	CT+RT	26%
	RT Alone	11%
	Reluctant for Chemotherapy	4%
Palliative Treatment		19%

Table 8: Table showing intent of therapy.

Discussion

In Asia head and neck cancer contributed about 57.5% of cases. In India nearly 200000 cases of head and neck cancer reported per year and associated with high morbidity like breathing difficulty, swallowing difficulty, speech, hearing, taste, smell and vision problem. Commonest age group was 50-60 years in our study, study done by Miyashi., *et al.* and Preetham., *et al.* shown 60-64 years and 61-70 years respectively [24]. Johnson., *et al.* reported commonest age group 51-60 in 39.3% patient while mean age at diagnosis was 52.1 years [25]. Gender distribution shown in our study was 4.5:1 and 82% patients were males, and 18% patients were female. Study done by Preetham reported 75% males and 25% females. Study done by Das Gupta., *et al.* showed male: female ratio was 2.7:1 with 73.15% males and 26.85% females [26]. Commonest Age Group reported by Michaelray., *et al.* was 54.4 ± 10.2 years, while Leigh., *et al.* reported 40-60 year age group in 47.6% of patients [27].

Male prepondence shown in our study and other studies also due to smoking, chewing and alcohol consumption habits are found more in males as compared to females. Commonest symptoms were ulceration/swelling in tongue and buccal mucosa followed by dysphagia and change of voice depending upon area of involvement. Study done by Preetham., *et al.* and Chauhan., *et al.* shown commonest symptoms was dysphasia 28.46% and 63% respectively followed by ulcer and lump in neck (28,29). Hoarseness of voice was reported in 50.76% cases and neck swelling in 49.23% by Das Gupta *et al.* [28]. Study done by Puthukidy PA shown dysphagia was commonest symptoms 38.46% followed by ulcer and neck swelling 23.08% , 17.31% respectively [28]. Chauhan., *et al.* so reported commonest presenting symptom dysphasia in 63% cases change in voice in 50.76% cases and neck swelling in 49.23% cases [29]. In our study, tobacco chewing was present in 76.76% patients in males. Smoking was present in 20.45% of cases and history of alcohol intake was in 9.5% cases.

Consumption of tobacco in either form by smokeless or smoking is more prevalent in Indian Population. Consumption of tobacco by oral route resulting absorption of carcinogens through oral mucosa causes irritation of tongue area and adjacent buccal mucosa can leads to ulceration or growth or both to that area reported damage and repeated repair can cause uncontrolled growth resulted magnificent change of mucosa. IARC – WHO reported high incidence of hypo pharyngeal cancer in Southern and Western part of India.

Study done by Das Gupta shown smoking in 58.3% cases, Tobacco/Betel nut chewing in 37.96% and alcohol consumption in 41.67% cases [25]. Puthikidy PA shown in his study 82.6% [28]. Patients had smoking habit, 76% of patients with habit of tobacco chewing. In our study, habit of tobacco chewing was commonest approximately in alcohol consumption in 9.6% and smoking in 20.45% patients. While 12% patients having habit of all type of addiction with alcohol, tobacco chewing and smoking. Study done by Puthukidy., *et al.* shown 82.6% patients had a habit of smoking 78% alcohol consumption [28] and 76% had history of chewing tobacco while Das Gupta., *et al.* reported smoking in 53.33% cases.

Most common site in our study was Ca Tongue followed by Ca Buccal Mucosa lower alveolus pharynx. Study done by Pathukidy., *et al.* shown commonest cancer was oropharynx 23.08%, Hypopharynx and Larynx 17.31%, 17.31% respectively [28]. While study done by Siddique., *et al.* shown common cancer was oropharynx cancer in North-East India [30]. Among subsite most common was Pyriform fosa (11.54%). Study done by Sanghvi., *et al.* with shown Ca Tonsil was commonest subsite in Ca oropharynx and Ca Glottis was commonest subsite in Laryngeal Ca [31]. Michaelray., *et al.* reported oral cavity was most commonly affected site [24]. Kalyani R., *et al.* reported in 2010, oral cavity was commonest gender-neutral site (24.2%). Among subsite Ca Larynx was commonest [32].

An epidemiological study conducted by Alam., *et al.* [33] in Uttar Pradesh reported oral cavity was commonest site in head and neck cancer. Ca Buccal mucosa was 2nd commonest sub site in our study while it was common subsite in Head and neck cancer in Indian Population [34]. Krishna., *et al.* [35]. also reported Buccal mucosa most commonly affected subsite in North India. In our study, average year of tobacco chewing was 12-28 years. Many of patients quit their habit of addiction after developing disease related symptoms approximately 38%.

Majority of Patients presented with ulcer oral cavity followed by dysphagia and neck swelling. Similar to reported by Chauhan., *et al.* due to habit of tobacco chewing is very common at our area [27]. Goud., *et al.* reported oral cancers are more common in some part of India and shown strong association with the habit of tobacco chewing (P value 0.01) [36]. Other study done by Pednekar., *et al.* in at Mumbai shows use of smokeless tobacco was associated with oral cavity and other cancers [37]. Use of smokeless tobacco in form of Khaini found in 51% of household in survey done in 0.1 million household [38].

Approximately more than 30 carcinogens were found in smokeless tobacco like nitrosamines aromatic amines. Polycyclic hydrocarbons, aldehydes and some metals [39]. Vitamin Deficiency and Iron Deficiency are also found to be etiological factors for hypopharyngeal cancer [32]. Habit of tobacco snuff also found. One of risk factor for development of hypopharyngeal and oropharyngeal cancer besides tobacco chewing [40]. Many epidemiological studies from Asian countries shown consumption of tobacco and alcohol are strongly related to Head and Neck cancer [35]. Dhule, *et al.* reported synergistic effect of alcohol and tobacco smoking in etiology of head and neck cancer [41].

Study done by Addala, *et al.* in Andhra Pradesh [42] shown habit of smoking, alcohol consumption and tobacco chewing were most common risk factor in both sexes. The study conducted in Netherlands for 17.3 years reported the consumption of alcohol and smoking are important risk factor for carcinogenesis in head and neck cancer [43]. The study conducted in Afro Caribbean population also shown alcohol and tobacco commonest risk factor in head and neck cancer [44]. Intake of tobacco either as chewing or smoking or any other form are commonly used by rural population reported by national sample survey India [45]. The study reported by Michealray, *et al.* shown 72.6% cases of head and neck cancer are associated with habit of tobacco chewing [46]. In our study 76.77% of cases associated with habit of tobacco chewing.

50 Patients were subjected to HPV testing but none of them shown positivity. It shown low cancer prevalence of HPV positivity in Bihar primarily, but large population testing is required to comment further. Study done by Michealray, *et al.* 10.5% positivity in their study. Ghiet, *et al.* shown study done in Central Asia reported HPV positivity in 15.7% cases [47]. However, one studies from South India reported very low positivity or Zero positivity in Head and neck cancer [48,49]. 29.2% patients were planned for 60 Gy/30 fraction in 6 weeks. Patients were planned for 66 Gy/33 fraction in 38% in 6 weeks and 27.2% patients were planned for 70 Gy/35 fraction in 7 weeks. 2 patients were planned for high dose radiotherapy 74 Gy/35 fraction in 7 weeks.

Paclitaxel carboplatin were given in 24% of patients every 21 days, 3-4 cycles chemotherapy received with and followed by concurrent chemoradiotherapy. Study done by Ray, *et al.* shown in 26% Patients received radiotherapy or concurrent chemo-radiotherapy after surgery. Surgery alone in 6.8% cases neo adjuvant chemotherapy chemoradiation in 11% of patients. Regarding compliance of radiation therapy in Head and neck cancer, in our study

was 68% with IMRT. In 13% patients, treatment was interrupted for one week due to grade 3 mucositis, wet desquamation, Anemia dysphagia. Mohanti, *et al.* reported only 56% compliance with their patients [50]. Sharma, *et al.* reported compliance in 62% [53=1]. Pandey, *et al.* shown 76.54% compliance stage of disease was not associated with compliance ECOGPS and intent of It in their study [52]. Older age and higher stage patients shown poor compliance. Higher stage patients shown poor survival in patients of Head and neck cancer patients reported by John, *et al.* [53].

In our study about 81% patients were treated with curative treatment about 58% patient were treated with chemotherapy and radiotherapy. 41% Patients were received radiotherapy alone after surgery and 9% patients received Radical Radiotherapy alone after neo adjuvant chemotherapy. 19% Patients received Palliative treatment in which 6% Patients received radiotherapy alone 30 Gy/10 fraction in 2 weeks' time which 13% patients were treated with palliative radiotherapy and weekly chemotherapy. In concurrent chemo radiotherapy 26% patients received cisplatin 40 mg/nm2 weekly, 37% patients received weekly Paclitaxel 100 mg/nm2 weekly. In neo adjuvant chemotherapy 57% patients received Docetaxel 80 mg/nm2 every 21 days interval 3 to 4 cycles. The majority of nasopharyngeal cancer presented about 60% with advanced disease shown residual disease after completion of treatment. Advanced stage Ca Tongue patients also presented with residual disease. After completion of treatment on radiological examination 11 Patients died within 6 months of their follow up due to prognosis of disease and chemotherapy induced hematological toxicity.

Conclusion

Head and neck cancer is the commonest cancer in males in India. Our study shown middle aged male predominance due to tobacco chewing; commonest habit in our area. Oral cavity cancers were commonest in our analysis with Carcinoma Tongue commonly reported subsite. Patients usually presented in advanced stage with low general condition due to swallowing difficulty and pain during swallowing. Surgery can be feasible in few patients. Concurrent chemo radiation in only treatment can be advised with these patients. Implementation of cancer prevention programmes, screening, early detection, maintenance of oral hygiene. Awareness of tobacco free life are the methods we can reduce the incidence of head and neck cancer.

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