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CANCER'S CANVAS : A SPECTRUM OF MALIGNANT LESIONS

Histopathology

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ABSTRACT

Introduction After cardiovascular diseases, Cancer is the second most prevalent cause of mortality worldwide claiming lives of thousands in India. A large population is inaccessible to health care system and many seek assistance at a later point. Thus, the goal of the study is to investigate the prevalence of malignant lesions by histopathology. **Objectives:** To study the histopathological spectrum of malignancies in the region of Tumkur, Karnataka. **Methods:** A retrospective study was implemented on 120 malignancies in Pathology department of Sri Siddhartha Medical College and hospital, Tumkur for a period of 12 months. All biopsies and resected specimens were examined and histopathologically confirmed malignancies were accepted and the spectrum of diseases were studied. **Results:** Out of 120 malignancies, majority were females 64, 56 were males with a male to female ratio:0.88:1. The most common age group of presentation is in the range of 51-60yrs. The youngest patient was a 17 yrs old female. Squamous cell carcinoma (58,48.3%) was the most common malignancy observed followed by Adenocarcinoma (29,24.2%). Other malignancies were Invasive breast carcinoma (10,8.3%), Infiltrating carcinoma breast Nos (4,3.3%), Basal cell carcinoma (4,3.3%), Urothelial carcinoma (3,2.5%), hepatocellular carcinoma (1,0.83%), Clear cell Renal Carcinoma (1,0.83%), Papillary thyroid cancer (1,0.83%). Breast Carcinoma (19,15.8%) was the most prevalent cancer in females. Amidst men it was Oral Cavity cancer (22,18.3%). **Conclusion:** Most Prevalent cancer found in this study is oral cavity cancer followed by breast cancer. The most prevalent histological type observed was squamous cell carcinoma. Incidence of cancer increased after 50 years hence this group should be targeted for screening and health awareness for early diagnosis and treatment hence reducing mortality.

KEYWORDS

Cancer, Histopathological, Oral Cavity.

INTRODUCTION

Cancer has plagued the human race for a long time. In developing nations especially, non-communicable diseases like cancer have become a significant health concern due to changing lifestyles, longer life expectancies and better management of infectious diseases. One of the main causes of death globally , the burden of cancer is increasing.[1,2] Approximately 10 million individuals receive a cancer diagnosis on an annual basis, out of which 6 million face the inevitable death.In 1982, the Indian Council of Medical Research (ICMR) launched the National Cancer Registry Programme (NCRP) in India. It offers statistics regarding, the prevalence rates of various malignancies. It was projected that in the year 2008, there were 94 lakhs new instances of cancer in India, with an incidence rate of 98.5 per lakh people, and 5.3 lakh cancer- related deaths, with a morality rate of 68 per lakh population.[1] The three most common causes of cancer in men worldwide are stomach, lung and colorectal; in women , the top three most common malignancies are breast, lung & stomach.[1,2] There have been reported cases of every kind of cancer in the Indian population. Lung, head & neck (mouth, tongue & larynx), colorectal & esophagus constitute the top five causes in males, whereas breast, cervix, ovary, oral cavity and uterine cancer forms the most prevalent malignancies in women. [1,2]

In India, there exists notable regional disparities in the prevalence of cancer. Understanding the prevalence, pattern & histological variation of neoplastic lesions is crucial for determining the type and extent of cancer present in a given area.[2]Hence keeping this in mind the current study was undertaken to study the prevalence of histopathological spectrum of malignant lesions in the local region of Tumkur, Karnataka in a tertiary care hospital to learn the type and frequency of different types of cancers.

MATERIALS AND METHODS:

This was a retrospective and prospective study to determine the histopathological spectrum of malignancies carried out in the department of Pathology. A total of 120 cases of neoplasms received in 1 year's duration from 1st July 2023 – 1st July 2024. All patients with lesions that were histopathologically confirmed as malignancies were included while benign lesions were excluded from the study. Specimens were sent to the Department of Histopathology for histopathological examination which included biopsies and resected specimens received over a period of 12 months were carefully examined and processed as per standard protocol. Histopathology report of malignant lesions for each patient was studied carefully.

STATISTICAL ANALYSIS

All analyses were performed using SPSS software. Age and gender was expressed as mean ± standard deviation and numbers and percentage. Categorical variables were expressed as numbers and percentages.

RESULTS:

Out of 120 malignancies, majority were females 64, 56 were males with a male to female ratio- 0.88:1. The most common age group of presentation is in the range of 51-60 years. The youngest patient was a 17 year old female and the oldest patient was of 90yr male. Squamous cell carcinoma (58,48.3%) was the most common malignancy observed followed by adenocarcinoma (29,24.2%). Other malignancies were Invasive breast carcinoma (10,8.3%), Infiltrating carcinoma breast Nos (4,3.3%), Basal cell carcinoma (4,3.3%), Urothelial carcinoma (3,2.5%), hepatocellular carcinoma(1,0.83%), Clear cell Renal Carcinoma (1,0.83%), Papillary thyroid cancer(1,0.83%). Breast Carcinoma(19,15.8%) as described was the most prevalent cancer in females. Amidst men it was Oral Cavity cancer (22,18.3%) .

Table No.1 Histopathological spectrum of different malignant lesions. Squamous cell carcinoma of the oral cavity was the predominant malignancy observed, followed by colonic adenocarcinoma and breast carcinoma.

MALIGNANCIES	NO. OF CASES : n	PERCENTAGE %
Squamous cell Carcinoma-Oral cavity	58	48.3 %
Adenocarcinoma- Colon	29	24.2%
Invasive breast carcinoma(NOS)	10	8.3%
Infiltrating breast carcinoma	4	3.3%
Basal cell carcinoma	4	3.3%
Urothelial Carcinoma	3	2.5%
Hepatocellular Carcinoma	1	0.88%
Clear Cell renal Carcinoma	1	0.83%
Papillary thyroid Cancer	1	0.83%

Table No.2 Age (in years) distribution of malignant lesions: malignant lesions were predominant in the 4h and 5th decade.

AGE (in years)	No. Of Cases : n	Percentage : %
10-20	01	0.83 %
21-30	02	1.66%

31-40	13	10.83%
41-50	29	24.16%
51-60	38	31.66%
61-70	19	15.83%
71-80	15	12.5%
81-90	03	2.5%

Table 3: Distribution of malignant lesions according to different Sites

Site	Number of Cases	Percentage
Oral Cavity and Salivary glands	37	30.8%
Central Nervous System	0	0%
Respiratory System	03	2.5%
Thyroid	03	2.5%
Breast	20	16.6%
Cervix	11	9.16%
Gastrointestinal System	31	25.8%
Skin	05	4.16%
Soft tissue and bone	02	1.6%
Penis	04	3.33%
Kidney and Urinary tract	04	3.33%
TOTAL	120	

PICTOGRAPHY:

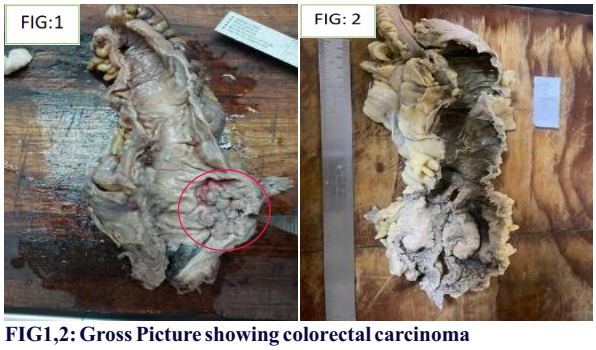

FIG1,2: Gross Picture showing colorectal carcinoma

MICROSCOPY

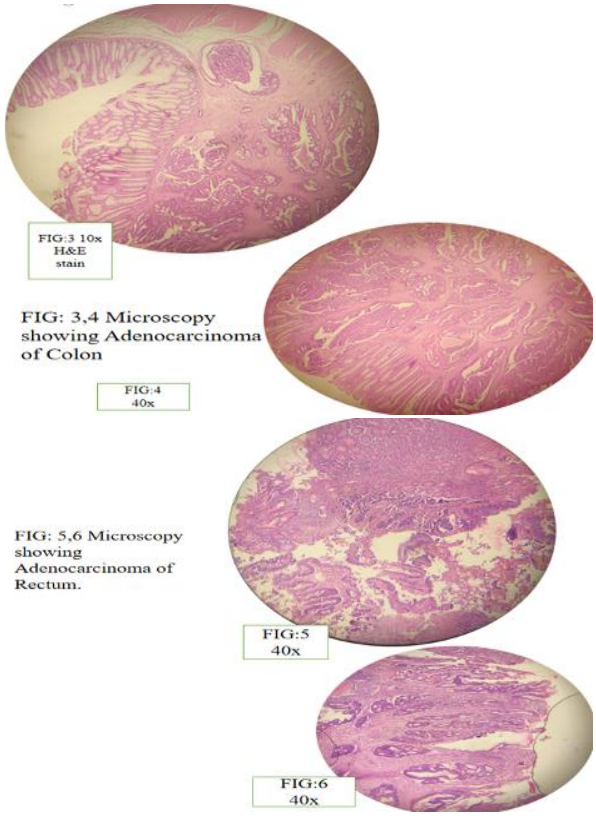

FIG:10 Gross Picture showing carcinoma breast

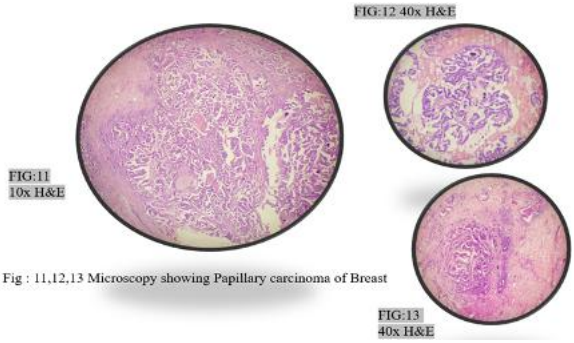

Fig : 11,12,13 Microscopy showing Papillary carcinoma of Breast

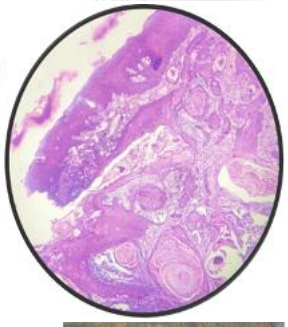

FIG 9: Microscopy showing Well-differentiated Squamous cell carcinoma

FIG7,8:Gross Picture showing oral cavity carcinoma

DISCUSSION:

- The number of cancer diagnoses a hospital receives each year is typically used to determine the severity of the cancer problem in that hospital or area.
- A total of 120 malignant lesions taken in our study were given histopathological diagnoses of malignancy.
- Age wise distribution of malignancies explained in (Table 2) with the most common age group being 5th decade. One major risk factor for cancer is advancing age. Although it can affect at any age, cancer is predominantly seen in elderly.
- In our study, minimum age of patient with cancer diagnosis is 17yr female and maximum age is 90 yr male.
- In general cancers are commonly witnessed in males compared to females. But the incidence of malignancies in present study was

higher in females (64) with male (56) to female ratio 0.88:1.

- According to a recent study, lung cancer is the most commonly diagnosed cancer in men followed by colorectal and prostate cancer. Breast cancer is the most frequently diagnosed cancer in women making it the primary cause of cancer-related mortality 6.
- In the present study, most commonly diagnosed cancer is oral cavity cancer (30.8%), followed by gastrointestinal cancer (25.8%).
- Among males the most common site involved is oral cavity followed by GIT, whereas in females the most common sites are Breast followed by cervix. The distribution of malignancies based on site is depicted in (Table:3).
- Oral Cavity cancer included sites from buccal mucosa, salivary glands, lower alveolus, maxilla, mandible, tongue, gingiva buccal sulcus which were found in total 37 cases. Among them Squamous cell carcinoma was the most common histological type. Most of the oral cavity cancers were reported in the age group of 20-90 yrs with predominance of 51-60 yrs of age.
- The youngest patient was a 17 year old female diagnosed with Invasive ductal breast carcinoma (NOS) and the oldest was a 90 year old male diagnosed with Basal cell carcinoma .
- In case of all gastrointestinal malignancies the most common affected site was colorectal (colon:10 cases, rectum: 6 cases) diagnosed with adenocarcinoma which was the most common histological type. The other site involved in gastrointestinal tract was esophagus with 5 cases diagnosed as squamous cell carcinoma and 2 cases diagnosed a adenocarcinoma.
- In case of breast malignancies, Invasive ductal Carcinoma (NOS) (10 cases,8.3%) was the most common histological type diagnosed followed by infiltrating ductal carcinoma (4 cases, 3.3%).The breast cancers were reported in the age group of 15-80 yrs. Most of the breast cancer cases were reported in the age group of 51-60yrs.
- Among all malignancies considered in the study, squamous cell carcinoma was the predominant histological type. Most common site being oral cavity.
- Majority of the cases of SCC were well-differentiated subtype. The other sites were SCC occurred were cervix, esophagus, penis, skin.
- Malignancies of skin comprised (5 cases,4.16%) of all malignancies. Most of them diagnosed as Basal cell carcinoma and the others were squamous cell carcinomas.
- Malignancies of kidney & urinary tract included 4 cases which were diagnosed as clear cell renal cell carcinoma (1,0.83%) and invasive urothelial carcinoma (3 cases, 2.5%) consecutively.
- 3 cases of thyroid malignancies were included in our study which revealed diagnosis of follicular variant of PTC (1,0.83%), Anaplastic carcinoma of thyroid (1,0.83%), Nodular Hashimoto's thyroiditis papillary carcinoma (1,0.83%)

Site	Ravi Mehrotra et al [3]	Mehmet Tahtabasi et al [4]	Sanjay Khandekhar et al [2]	Kanchana Narayan et al [1]	Present Study.
Oral Cavity and salivary glands	11.8	5.9	23	4.76	37
Central nervous system	0	1.6	0	4.76	0
Respiratory system	3.2	10.2	04	30.95	2.5
Thyroid	0	05	7.55	2.38	2.5
Breast	06	7.3	19.55	4.76	16.6
Cervix	6.1	6.7	08	16.6	9.16
Gastrointestinal System	22.7	23.11	9.77	9.52	25.8

Table 4:Comparison of distribution of malignancies with other studies.

Contd.

Site	Ravi Mehrotra et al [3]	Mehmet Tahtabasi et al [4]	Sanjay Khandekhar et al [2]	Knachana Narayan et al [1]	Present Study.
Kidney & urinary tract	2.1	5.3	3.11	0	3.33
Skin	3.2	2.8	04	14.2	4.16
Soft tissue &Bone	0	5.3	2.66	7.14	1.6
Testis	0	0.5	2.66	0	0
Ovaries	0	1.5	4.88	0	0
Prostate	2.4	4.3	3.11	0	0
Penis	0	0	0	0	3.33
Others	42.5	18	4.16	0.17	0

Table 4:Comparison of distribution of malignancies with other studies.

- The present study evaluated the histopathological distribution of malignancies across different organ systems and compared the findings with previously published studies by Ravi Mehrotra [3], Mehmet Tahtabasi [4], Sanjay Khandekhar [2], and Kanchana Narayan [1]. The comparison demonstrates both similarities and regional variations in the pattern of malignancies.

- In the present study, malignancies involving the **oral cavity and salivary glands** constituted the most common group, accounting for **37%** of cases. This finding was considerably higher than those reported by Ravi Mehrotra et al. [3] (11.8%), Mehmet Tahtabasi et al[4] (5.9%), and Kanchana Narayan et al. [1] (4.76%), but was relatively comparable to the findings of Sanjay Khandekhar et al[2]. (23%). The higher prevalence of oral malignancies in the present study may be attributed to increased consumption of tobacco, betel nut chewing, smoking habits, alcohol intake, and poor oral hygiene practices prevalent in the studied population. Squamous cell carcinoma of the oral cavity formed the predominant histological subtype, which is consistent with established epidemiological patterns reported in Indian studies.

- The **gastrointestinal system** represented the second most commonly affected site in the present study with **25.8%** of cases. Similar observations were reported by Ravi Mehrotra et al. (22.7%) and Mehmet Tahtabasi et al. (23.11%), suggesting a relatively consistent burden of gastrointestinal malignancies across studies. However, lower frequencies were observed in the studies conducted by Sanjay Khandekhar et al. (9.77%) and Kanchana Narayan et al. (9.52%). The predominance of gastrointestinal malignancies may reflect changing dietary habits, sedentary lifestyle, obesity, chronic inflammatory disorders, and improved diagnostic facilities leading to increased detection rates.

- **Breast malignancies** accounted for **16.6%** of cases in the present study and showed comparable findings with Sanjay Khandekhar et al. (19.55%). Lower frequencies were observed in the studies by Ravi Mehrotra et al. (6%), Mehmet Tahtabasi et al. (7.3%), and Kanchana Narayan et al. (4.76%). The increasing burden of breast carcinoma observed in the present study may be related to delayed childbearing, reduced breastfeeding duration, hormonal influences, urban lifestyle changes, and improved awareness and screening practices.

- **Cervical malignancies** constituted **9.16%** of cases in the current study, which was intermediate compared to previous studies. Kanchana Narayan et al. reported a comparatively higher prevalence (16.6%), whereas Ravi Mehrotra et al., Mehmet Tahtabasi et al., and Sanjay Khandekhar et al. reported frequencies of 6.1%, 6.7%, and 8% respectively. Variations in cervical cancer prevalence may be explained by differences in HPV exposure, socioeconomic conditions, accessibility to screening programs, and vaccination coverage.

- **Respiratory system** malignancies represented only **2.5%** of cases in the present study, which was markedly lower than the 30.95% reported by Kanchana Narayan et al. This discrepancy may be due to geographical variations in smoking prevalence, occupational exposure, environmental pollution, and referral patterns between institutions.

- The incidence of **thyroid malignancies** in the present study was **2.5%**, which was lower than the frequencies reported by Mehmet Tahtabasi et al. (5%) and Sanjay Khandekhar et al. (7.55%). Similarly, **skin malignancies** accounted for **4.16%** of cases, which was comparable to the findings of Ravi Mehrotra et al. and Sanjay Khandekhar et al., but significantly lower than the 14.2% reported by Kanchana Narayan et al.

- Malignancies involving the **kidney and urinary tract** constituted **3.33%** of cases in the present study, showing results comparable with previously published literature. Soft tissue and bone tumors were relatively infrequent, accounting for **1.6%** of cases, which was lower than the rates documented in other comparative studies.

- Interestingly, no cases involving the **central nervous system, testis, ovaries, or prostate** were encountered in the present study. This may be attributed to the limited sample size, shorter study duration, referral bias, or regional variation in disease distribution.

- Overall, the present study demonstrates that oral cavity malignancies continue to represent a major cancer burden in the

studied population, followed by gastrointestinal and breast malignancies. The observed variations in comparison with other published studies may be influenced by demographic factors, lifestyle patterns, environmental exposure, genetic predisposition, healthcare accessibility, and institutional referral trends. The findings of the present study emphasize the importance of region-specific cancer surveillance, early screening programs, lifestyle modification strategies, and public health awareness initiatives for reducing cancer-related morbidity and mortality.

CONCLUSION

- Among males, the common site involved was oral cavity followed by gastrointestinal system whereas in females the common sites affected were breast followed by cervix. Squamous cell, carcinoma was the most common histopathological type among all the cancers at different sites.
- Invasive ductal carcinoma (NOS) was common among women in this study.
- With cancer incidence increasing after 50 years, this group is the susceptible group for health education and promotion and screening so that early diagnosis and timely treatment can be given.
- This will reduce cancer related deaths all over the country. Based on this current study we see that there is requirement for cancer screening programs like self breast examination for any abnormalities, endoscopic biopsies for both males and females, ultrasonograms/ mammograms, cervical pap smear examination in females for the population in the age group of 50 and above.

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