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Manoeuvring through tumours of the head and neck An informative over view

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ABSTRACT

This overview provides basic information on the types and subtypes of head and neck tumours, emphasising the importance of early detection and treatment, it explores possible reconstruction options following surgical excision by offering insight into risk factors, symptoms, and reconstructive procedures, this overview enhances awareness and understanding of head and neck tumour management.

Key words: Head and neck tumours, Types, subtypes, Reconstruction options, Awareness

BACKGROUND

Head and neck cancers (HNCs) are a complex group of tumours that form a significant global disease burden. To date, they have been treated, for the most part, with combined traditional therapies (surgery, chemotherapy, and radiation therapy). In the last few years, researchers have focused on different therapies based on our current understanding of these diseases. In addition, advances in molecular biology allow for the dissection of HNC molecular landscapes, and they are likely to guide the implementation of effective targeted treatments. Pillars of evidence-based modern medicine, treatments include surgery, radiation therapy, and chemotherapy, alone or in different combinations. Overall, their prompt implementation has significantly increased the cure rate, especially in the early stages, as well as survivorship. By informing, orienting, and guiding the selection of the most effective interventions for individual patients, onco-genomics, as is the case for all other tumour types, represent the fundamental piece in the puzzle of HNC. While there are many review papers; some combining salivary glands tumours to HNC, or focusing mostly on nasopharyngeal tumours, the aim of this review was to focus purely on HNC.

Objectives

To share experience regarding the pattern of presentation of malignant tumour in head and neck: presenting size, presenting symptoms, Commonly affected areas, Commonly presenting

histopathological types, the pattern of distribution among age groups, gender, occupation, patient awareness regarding head and neck lesion.

METHODOLOGY

Study design :Prospective descriptive hospital based study.Single unit experience
Study period : 12months' duration
Study population :All patients presented with head and neck lesions that proved to be malignant by histopathology.
Follow up: 4 weeks after surgery for early complication.
Exclusion criteria :Patients with lesion that discovered to be benign
Data collection: The data collected by the researcher through an anonymised questionnaire.

Data analysis: The analysis of data through computer using statistical package for social sciences (SPSS) software and the results will be expressed in tables and figures.

RESULTS

Male patients were 62.8%, and female were 37.2% (fig1), male to female ratio 1.7-1.0. The most affected age group was 71-80 years 20.9%, minimum age 10 years, maximum 85, mean age 51 years (fig.2). Patient's jobs were 51.2% indoor and 48.8% outdoor (fig.3.). Lesions that arise denovo were 65.1%, while 34.9% arise on pre-existing lesions (tab.1). The commonest presenting lesions were painless lumps and bleeding ulcers, each of them 11%, then painful lumps, discharging lumps and ulcers, each was 7.0% (tab.2).

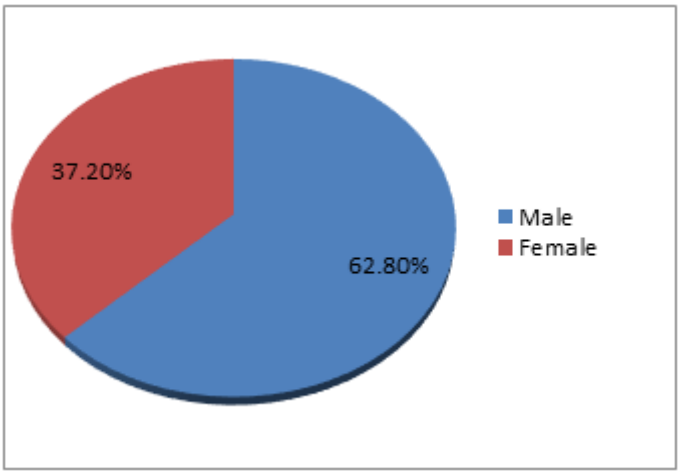

Figure 1: distribution of the disease between males and females

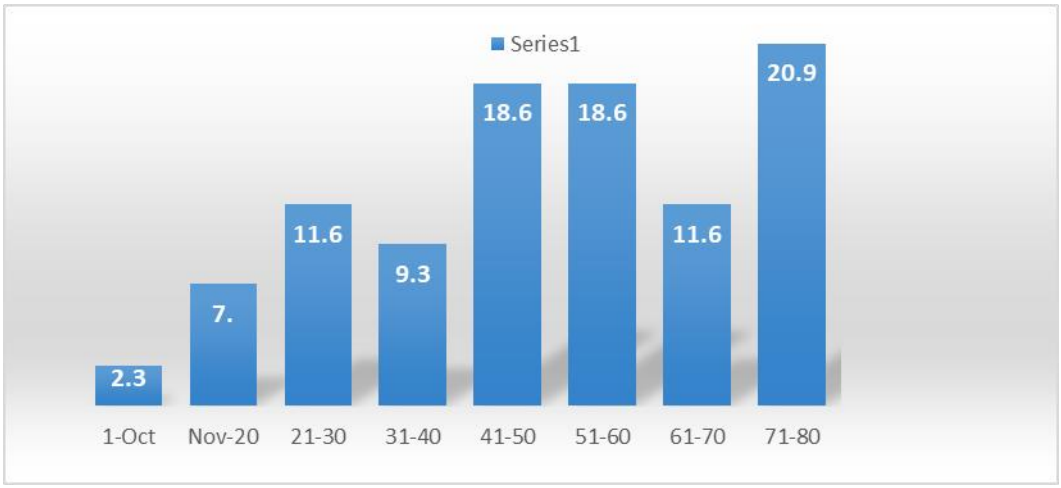

Figure 2: Age distribution of the patients

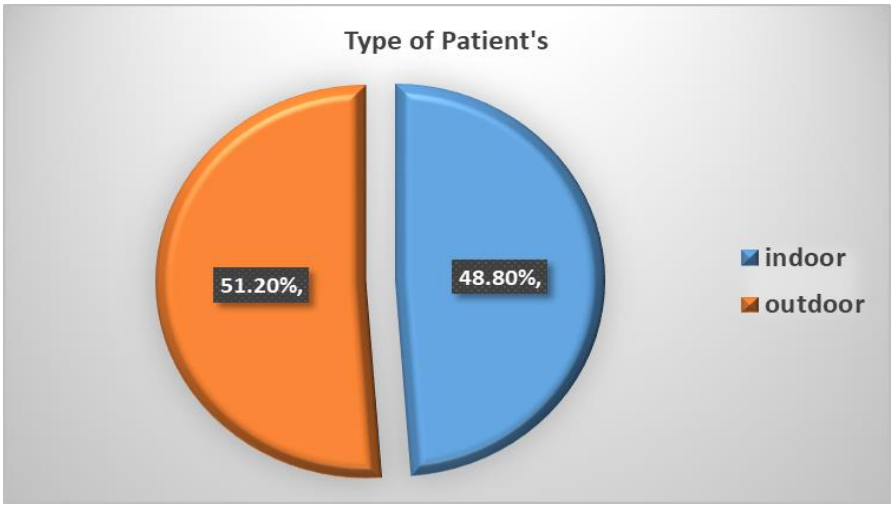

Figure 3: Type of patient's jobs

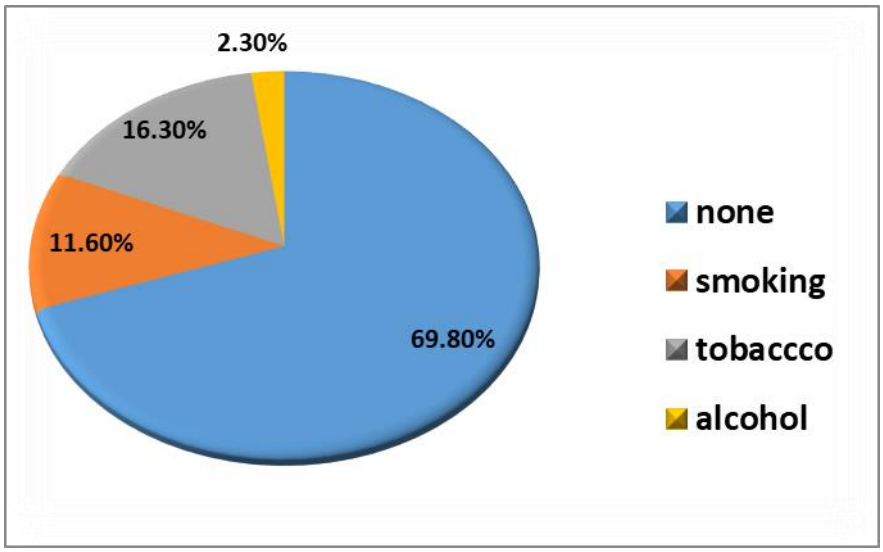

Figure 4: Habits of the patients

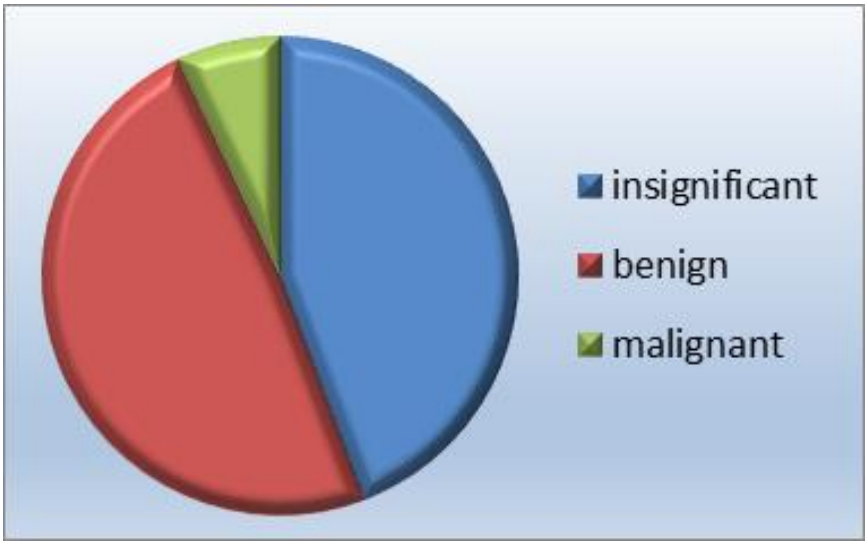

Figure 5 : Patient's first suspicion toward the lesion

Table 1: Pre-existing disease or lesion frequency among the patients

	Frequency	Percent
Mole	2	4.7
Neiva	2	4.7
Ulcer	2	4.7
imm.supp	1	2.3
Xeroderma	2	4.7
Albinism	1	2.3
Others	5	11.6
None	28	65.1
Total	**43**	**100.0**

Table 2: Frequency of presenting lesions in head and neck.

	Frequency	Percent
Lump	11	25.6
Ulcer	7	16.3
painful lump	7	16.3
bleeding ulcer	11	25.6
discharging lump	7	16.3
Total	**43**	**100.0**

Table 3: Percentages of types of head and neck malignancies

	Frequency	Percent
basal cell carcinoma	12	27.9
Scc	14	32.6
Mm	1	2.3
Parotid	8	18.6
submandibular	1	2.3
secondaries	4	9.3
Others	3	7.0
Total	**43**	**100.0**

Table 4: Frequency of distribution of malignancies in head and neck regions

Diagnosis	site						Total
	midface	forehead	Lower face	scalp	neck	oral cavity	
basal cell carcinoma	8	3	0	1	0	0	12
scc	4	1	2	1	0	6	14
mm	0	0	0	1	0	0	1
parotid	5	0	2	0	1	0	8
submandibular	0	0	1	0	0	0	1
secondaries	0	0	0	0	4	0	4
others	1	0	1	1	0		3
Total	18	4	6	4	5	6	43

The mean size of the lesion on presentation was 7.0 cm. Area of the mid face was the commonest affected site 44.2% followed by the oral cavity 16.3%, lower face 14%, forehead and scalp 9.3% each, and neck 7.0% . SCC was the commonest final diagnosis 32.6%, followed by BCC 27.9%, parotid carcinomas 18.6%, secondaries 9.3%, rare tumours 7.0%, malignant melanoma and submandibular gland carcinoma 2.3% each (tab.3 &4). BCC was the commonest of skin tumours; 12 out of 21 patients i.e. 57.9%. Patients who were operated on 95.3%, while 4.3% were very advanced and unfit for surgery.

After resection of the tumours; 41.9% of defects were amenable to primary closure while 55.9% of patients needed reconstruction of resulting defects (tab. 5)

Table 5: Types of surgical treatment

	Frequency	Percent
primary closure	18	41.9
Immediate reconstruction	22	51.2
Delayed reconstruction	2	4.7
none	1	2.3
Total	**43**	**100.0**

DISCUSSION

Skin cancers are a prevalent form of malignancy, particularly in the head and neck region which is subjected to significantly higher exposure to sunlight compared to other areas of the skin. Nearly half of head and neck cancers originate from the skin, with the most commonly affected age group being 60-80 years. The male to female ratio in these cases is 1.5 to 1. However, it is not uncommon for patients with skin cancers to seek medical attention at a much later stage in the progression of the disease. These types of cancers are often characterised as "advanced," "massive," "complex," . There are various reasons why patients present with such extensive tumours, including primary referral failure and patient neglect.

Basal Cell Carcinoma:

Caucasian individuals could experience this specific type of skin growth that is relatively non-threatening. These growths typically expand slowly and tend not to metastasize. However, if they occur near the nose or eyes, they may reappear and pose more of a challenge. Thankfully, they are usually easily treatable, with a success rate of 90% for cases involving the head and neck. These growths come in various forms, such as nodular, superficial, pigmented, or morphoiec.

Squamous Cell Carcinoma

Around 20-30% of skin tumors and 90% of head and neck cancer. have the potential to spread, with a preference for growing vertically and becoming more

aggressive. These tumors are commonly found in areas of previous scars, on embryonic fusion plates (such as the nasolabial folds and inner canthus of the eye), non-sun exposed skin, and larger, deeper lesions. Recurrence rates are also higher in these cases.

Melanoma of the Head and Neck

Between 10% and 25% of melanomas are found in the head and neck region, with the most common sites being the skin of the cheek and the occipital scalp. Mucosal melanomas make up 6% to 10% of all head and neck melanomas, with the hard palate being the most common location. There are different types of these melanomas, including superficial spreading melanoma, nodular melanoma, lentigo maligna, and acral lentiginous melanoma.

SALIVARY GLANDS:

Parotid Gland Anatomy:

Positioned amidst the mandibular ramus and the external auditory canal, the parotid gland is partitioned into superficial and deep lobes by the facial nerve. Stenson's Duct, lined with basophilic, serous cells, traverses the masseter, the buccinator muscle, and eventually opens across from the second upper molar. The gland lies atop the masseter muscle anteriorly and the sternocleidomastoid muscle posteriorly.

Submandibular Gland Anatomy:

Below the mylohyoid muscle and above the digastrics, sits the submandibular triangle. The superficial layer of the deep cervical fascia encases the gland and holds the marginal mandibular nerve. The hypoglossal nerve runs beneath the digastric tendon and towards the deep layer of the deep cervical fascia. The facial artery comes from the external carotid artery, and traces a path medial to the posterior digastric muscle before entering the gland and exiting into the facial notch of the inferior mandible. The lingual artery runs alongside the lateral aspect of the middle constrictors, behind the digastrics, and forward and medially to the hyoglossus. The histological cell type of this gland is mixed, containing both serous and mucinous cells. Wharton's duct opens to the side of the frenulum in the front part of the floor of the mouth, behind the incisors.

Minor Glands and Sublingual Gland Anatomy:

The sublingual gland is situated in the submucosal layer of the floor of the mouth. There are numerous minor salivary glands also located in the submucosal layer of the oral cavity, oropharynx, nasopharynx, and hypopharynx. These glands consist of mucinous cells and are drained by the ducts of Rivinus, which empty at the sublingual fold or plica of the mouth floor.

SALIVARY GLAND MALIGNANCY:

Salivary gland neoplasms account for approximately 6% of head and neck tumors and are typically diagnosed in individuals over the age of 60. Indications of malignancy may include the presence of a slowly or rapidly enlarging mass, facial nerve involvement, persistent pain, and cervical lymphadenopathy. Various types of salivary gland malignancies exist, such as Mucoepidermoid Carcinoma, Adenoid Cystic Carcinoma (Cylindroma), Acinic Cell Carcinoma, as well as others like Squamous Cell Carcinoma, Lymphomas, Adenocarcinoma, Malignant Oncocytoma, Epithelial-Myoepithelial Carcinoma (Clear Cell), Salivary Duct Carcinoma, and Undifferentiated Carcinoma.

ORAL CANCER:

30% of all head and neck cancers affect the oral cavity, with oral cancer showing significant variations in incidence depending on geographical, cultural, and ethnic factors. This variation ranges from a low incidence of 1-2% in Japan to over 40% in Sri Lanka and 50% in India. The oral cavity has the highest rate of second primaries, and more than 90% of occult metastatic disease involves nodal groups I–III. The structure of the oral cavity and its sub sites, as well as the regional lymph node potential, play a crucial role in the development and treatment of oral cancer. Lips, buccal mucosa, alveolar ridge, retro molar trigone, hard palate, oral tongue, and floor of the mouth are common sites of oral cancer, each with its unique characteristics, such as lymphatic drainage, regional metastasis rates, and overall 5-year survival rates. The most common types of oral cancer include squamous cell carcinoma (SSC), verrucous carcinoma, and basal cell carcinoma, with other less common types including lymphoma, Kaposi’s sarcoma, salivary gland malignancies, and melanoma.

CANCER OF THE NECK:

The majority of neck tumors are caused by the spread of cancer from other areas of the body, accounting for about 85% of cases. Primary tumours that originate in the neck are less common, making up approximately 15% of cases. These can come from salivary glands,

thyroid, or lymph nodes. When other cancers spread to the lymph nodes in the neck, it accounts for 14% of head and neck cancers. Regional metastasis, where cancer spreads to surrounding tissue and blood vessels, is common in areas like the base of the tongue, supra glottis, ventral tongue, and soft palate. This process involves cancer cells invading blood vessels and lymphatic tissue using enzymes. While most cancer cells that enter the blood vessels are destroyed, some can become trapped in the lymph nodes and continue to grow.

Nodal Levels

I The area below the chin and under the jaw
II Above the hyoid bone or carotid bifurcation to the bottom of the skull; containing the upper jugular lymph nodes
III Middle section, above the omohyoid muscle to the carotid bifurcation; containing the middle jugular lymph nodes
IV Lowest part, above the clavicle to the omohyoid muscle; containing the lower jugular lymph nodes
V Back of the neck
VI Front neck, between carotid sheaths

Lymphoma:

Factors contributing to the development of these disorders include exposure to irradiation, the Epstein-Barr virus (linked to Burkitt's lymphoma), human immunodeficiency virus (HIV), immunosuppression, exposure to organic toxins like phenols and benzenes, infection with human T-cell lymphotropic virus (HTLV-1, associated with T-cell malignancies), and immunological conditions such as rheumatoid arthritis and celiac disease. Hodgkin's Lymphoma is characterised by a bimodal incidence curve, with peaks in teenagers and middle-aged adults.

Reconstruction of head and neck defects

In order to have a successful reconstruction, it is essential to carefully assess the patient and create a personalized treatment plan. Factors such as the stage and prognosis of the tumour, the patient's age, sex, and body type, as well as functional status and reconstructive donor sites, must all be taken into consideration. Understanding the patient's psychosocial background is also important for a comprehensive approach to their care. The main aims of surgical treatment for head and neck cancer are not only to completely remove the tumour but also to restore both function and aesthetics in a single-stage operation. Current techniques, such as pedicled flaps and free tissue transfer, have revolutionised the field of reconstructive surgery and have set a new standard of care.

No reconstructive procedures should come before adequate tumour resection, as the primary priority in head and neck cancer reconstruction is always safety. With the proper tumour removal protocols in place, reconstructive techniques can be utilised effectively and with optimal outcomes. The reconstructive ladder serves as a helpful guide for planning, encompassing a range of methods that can be employed based on the specific needs of each patient. From primary closure to free tissue transfer, there is a variety of options available that can be tailored to individual cases.

Advancements in medical technology and innovative surgical approaches have led to the development of various types of grafts and materials that can be used in reconstruction, each with its own set of advantages and disadvantages. Local and regional pedicled flaps have emerged as effective reconstructive techniques and have proven to be reliable options for addressing a wide range of defects. However, the development of microvascular free flaps has truly transformed the landscape of head and neck cancer reconstruction.

These advanced techniques allow for the transfer of healthy tissue from remote sites with their own dedicated blood supply, facilitating single-stage procedures with high levels of success. While these methods have numerous benefits, it is also important to acknowledge the potential challenges that may arise. Microsurgical expertise is essential in performing these intricate procedures, ensuring the optimal outcome for the patient.

A holistic approach, led by a multidisciplinary team of specialists, can help mitigate these challenges and provide the patient with the best possible care and outcomes in head and neck cancer reconstruction. Through collaboration and comprehensive evaluation, every aspect of the patient's needs can be addressed to ensure a successful outcome.

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Authors contribution

Ramy Aly: Literature search and review, formal analysis, writing the original draft, review and editing.

Hulla Mohammed: Conceptualisation, Investigation, Methodology.

Tarek Eltantawy : Review and editing.

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