SHORT REPORT

An insight into the histopathology of oral potentially malignant disorders and malignant neoplasms of head and neck

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Abstract

This retrospective, descriptive, cross-sectional study was planned to analyse histopathological variations in oral potentially malignant disorders and malignant tumours of the head and neck region. Incisional and excisional biopsies referred to the histopathology laboratory of Peshawar Medical College, Pakistan, between 2020 and 2022 were reviewed by two pathologists to confirm the diagnosis. The World Health Organisation criterion of diagnosis and classification was adopted to review and validate the histopathological features. A total of 16 oral potentially malignant disorders and 77 head and cancer biopsies were included. Among the disorders, lichen planus was common, presenting as subepithelial lymphocytic infiltration in 11(100%) cases. Among the head and neck tumours, oral squamous cell carcinoma was the foremost cancer in which cells were arranged in a nest pattern 37(84%), followed by basal cell carcinoma showing nodular type 10 (83%). The histopathological variations of the lesions identified may assist pathologists in better diagnosis.

Keywords: Histopathology, Head and neck cancer, Squamous cell carcinoma, Lichen planus.

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Introduction

Head and neck is a complex region of the body harbouring different malignancies with distinctive histological presentations. More than 500,000 new cases are reported every year, most of which are squamous cell carcinomata (SCC).[1] Oral potentially malignant disorders (OPMDs) are clinical presentations that carry a risk of cancer development in the oral cavity. Leucoplakia is the most common OPMD encountered in clinical practice.[2]

Timely diagnosis of head and neck cancer is vital for proper management aiming at increasing the survival rate of the patient. Despite a variety of diagnostic tools available, histopathology is still considered the gold standard for primary diagnosis. Histopathological assessment is an art to identify diseases by visual examination of any abnormal morphology of the tissues, and it requires in-depth knowledge of the pathological mechanisms involved in diseases, as well as experience and skills among the pathologists.[3]

A precise diagnosis of premalignant or malignant lesions depends on ample clinical information, the quality of the biopsy, and the correct interpretation of biopsy results. The current study was planned to analyse histopathological variations in OPMDs and malignant tumours of the head and neck region, with the aim of enhancing understanding and facilitating diagnosis.

Methods and Results

The retrospective, descriptive, cross-sectional study was conducted at the histopathology laboratory of Peshawar Medical College (PMC), Pakistan, from April 13 to December 30, 2022, after approval from the ethics review board of Prime Foundation, Pakistan. Tissue samples related to incisional and excisional biopsies from 2020 to 2022 were retrieved using non-probability convenience sampling technique. Histologically confirmed primary tumours of head and neck region were included, while secondary tumours and all cases with incomplete data were excluded.

Data including demographic and clinical details along with histological findings was documented. The slides stained with haematoxylin and eosin (H&E) were reviewed for histopathological spectrum of all the cases by 2 independent histopathologists using the World Health Organisation (WHO) criterion.[4] Data was analysed using SPSS 19.

A total of 16 OPMDs and 77 head and cancer biopsies were included. The mean age of the patients was 54.4±14.9 years (range: 3-100 years). The male gender was predominantly affected by malignancies of the head and neck region (Figure). The total number of diagnosed cases of oral squamous cell carcinoma (OSCC) were 48(62.3%), and 44(91%) of them were graded as well-differentiated SCC (WDSCC), 3(6.2%) as moderately-differentiated (MDSCC) and 1(2%) as poorly-differentiated SCC (PDSCC). The most common pattern in which the squamous cells were arranged was nests 37(84%), followed by cords 4(9%) and islands 3(7%) in WDSCC cases. Intercellular bridges were prominently seen in 25(56%) cases of WDSCC with features of dyskeratotic cells, while

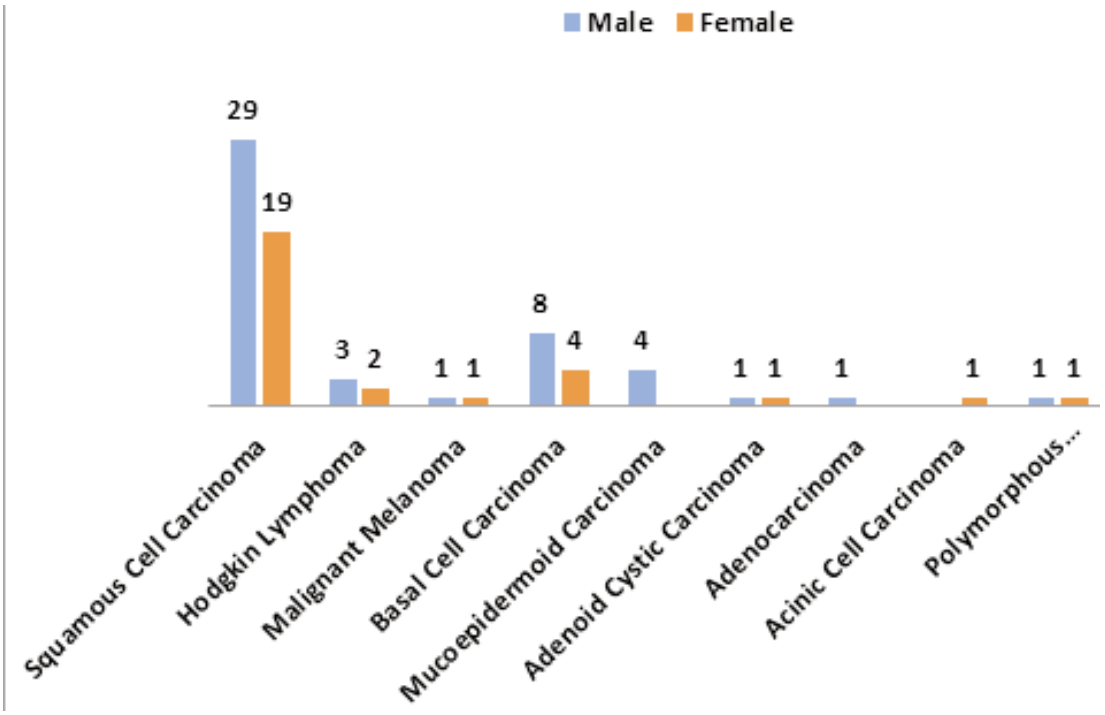

Figure: Distribution of head and neck cancer with respect to gender (n=77)

Table-1: Microscopic features of OSCC and their grades.

Microscopic Features	Well Differentiated	Moderately Differentiated	Poorly Differentiated	Total (48)
Pattern				
Nests	37	03	01	41
Cords	04	0	0	04
Islands	03	0	0	03
Intercellular Bridges				
Prominent	25	0	0	25
Absent	19	03	01	23
Dyskeratotic Cell and Squamous Pearls				
Prominent	38	01	0	39
Absent	06	02	01	09
Cellular and Nuclear Pleomorphism				
Mild	0	0	0	0
Moderate	11	01	01	13
Marked	33	02	0	35
Mitotic Figures	36	0	01	37

OSCC: Oral squamous cell carcinoma.

squamous pearls were found in 38(86%) cases. Prominent mitotic figures were seen in 36(75%) WDSCC cases (Table 1). A total of 16 OPMDs were confirmed on the basis of both clinical and histopathological features. The oral cavity was the frequent site of occurrence 15(93.7%) for OPMDs, while the site of 1(6.2%) case was skull base. Among them, 11(68.7%) cases were diagnosed as oral lichen planus, 3(18.7%) were leucoplakia and 2 (12.5%) were smokeless tobacco keratosis. The microscopic findings were noted (Table 2).

Table-2: Microscopic features of oral lichen planus.

Histological Findings of Oral Lichen Planus as per WHO criterion[4]	No of Cases (%)
1 Hydropic degeneration of basal layer	04 (36.3)
2 Plasma cells in the connective tissue	01 (9.0)
3 Band-like sub epithelial lymphocytic infiltration	11 (100)
4 Fibrin deposit in the epithelium	0 (0)
5 Epithelial hyperkeratosis	09 (81.8)
6 Acanthosis	03 (27.2)
7 Civatte bodies	02 (18.1)
8 Necrotic keratinocytes in epithelium	0 (0)
9 Epithelial hyperplasia	01 (9.0)
10 Flattening of epithelial crest	0 (0)
11 Hypergranulosis	04 (36.3)

WHO: World Health Organisation.

Other head and neck malignancies included salivary gland tumours, such as mucoepidermoid carcinoma 4 (5%), adenoid cystic 2 (2.5%), polymorphous adenocarcinoma 2 (2.5%), acinic cell 1 (1.2%), adenocarcinoma 1 (1.2%), basal cell carcinoma 12 (15.5%), Hodgkin's lymphoma 5(6.4%) and malignant melanoma 2 (2.5%). The histological patterns and grades were also noted (Table 3).

Table 3: Other malignant neoplasms of the head and neck region (n=29).

Type	Grades/Morphological patterns (n)					Total (29)
Mucoepidermoid Carcinoma	Low Grade (3)	Intermediate Grade (0)	High Grade (1)			04
Adenoid cystic carcinoma	Cribriform (2)	Tubular (0)	Solid (0)			02
Acinic cell carcinoma	Microcystic (1)	Solid (0)	Follicular (0)			01
Polymorphous Adenocarcinoma	Cribriform (1)	Lobular (0)	Trabecular (1)	Solid (0)	Papillary-cystic (0)	02
Adenocarcinoma	Low Grade (0)	Intermediate Grade (1)	High Grade (0)			01
Basal cell carcinoma	Nodular (10)	Micronodular (1)	Infiltrating (1)			12
Hodgkin lymphoma	Mixed cellularity classical Hodgkin lymphoma (2)	Lymphocyte predominant Hodgkin lymphoma (1)	Nodular sclerosis classical Hodgkin lymphoma (2)			05
Malignant Melanoma	Not specified					02

Discussion

The mean age of the patients in the current study was 54.4 years, with a male predominance. Similar results have been reported by Badola et al.[5]

Among OSCC, the well-differentiated grade was the most frequent, with atypical squamous cells in a nest arrangement. A study revealed islands as the dominant pattern.[6] The distribution of tumour cells in cords was found in 4 cases, which is in line with a study in Romania.[6] Other features, like dyskeratotic cells and keratinisation, were prominent in 86% of well-differentiated and 33% of moderately-differentiated grades in the current study. No keratinisation was observed in poor grades of OSCC. In contrast, Shavlokhova et al. reported 22% keratinisation in well-differentiated, and 43% in poorly-differentiated OSCC, with none in moderately-differentiated cases. The disparity might be due to the sample which largely consisted of poorly-differentiated grade in the earlier study.[7] Another study reported keratinisation in most WDSCCs, with intracytoplasmic keratinisation in 31% OSCC cases.[6] The characteristic of moderate to mark cellular and nuclear pleomorphism was present in 100% cases in the present study. Interestingly, prominent mitotic figures in 75% of WDSCC cases were noted compared to none reported by Shavlokhova et al. across all OSCC gardes.[7]

Regarding OPMDs, oral lichen planus (68%) was frequently observed in the current study, presenting band-like subepithelial lymphocytic infiltration in 100% cases as the common histological finding, followed by epithelial hyperkeratosis in 81% cases, and hydropic degeneration of basal layer and hyper granulosis in 36% cases. One study showed band-like subepithelial lymphocytic infiltration in all cases, but hydropic degeneration of the basal layer seen in 100% cases was is in contrast to the current findings.[8]

The morphological patterns and grades of salivary gland tumours, basal cell carcinoma and Hodgkin's lymphoma were also reviewed in the present study. Among salivary gland malignancies, mucoepidermoid type was the most common, presenting as low-grade tumours, followed by adenoid cystic arranged in cribriform pattern. Bobati et al. reported similar findings.[9] The majority of basal cell carcinoma (83. 3%) presented as nodular lesions in the current study, while a study showed a high number of the cases as nodular type.[10] Regarding presentation of Hodgkin's lymphoma, the current study found equal number of cases (40%) as mixed cellularity and nodular sclerosis subtypes. In contrast, Konkay et al. reported maximum number (67%) of mixed cellularity classical Hodgkin's lymphoma.[11]

The current study has limitations as data related to a single centre. Multicentre studies are needed to validate the current findings.

Conclusion

The diagnosis of the patients with OPMDs and malignant neoplasms of the head and neck region poses a great challenge because of its unique and diverse histopathological features. Therefore, clinical examination, biopsy and histopathology are needed together for professional diagnosis.

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AUTHORS' CONTRIBUTIONS:
FI: Concept, design, data acquisition, analysis, interpretation and agreement to be accountable for all aspects of the work.
NB: Drafting, revision and final approval.