

Comparitive Analysis of Broder & Bryne's Grading of Squamous Cell Carcinoma in Different Anatomical Sites

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Abstract: Squamous cell carcinoma (SCC) is an epithelial malignancy that occurs in organs that are normally covered with squamous epithelium. Development of early diagnostic and cost effective methods can reduce mortality. Bryne developed a simple morphological malignancy grading system that restricts the evaluation to the deep invasive front of the tumour. The present study was conducted in the Department of Pathology at Subharti Medical College and associated ChhatrapatiShivaji Hospital, Meerut, from June 2014– May 2017. Total 173 cases were collected. All the lesions were categorised according to anatomical sites. Maximum cases of moderately differentiated squamous cell carcinoma were in oral cavity (32.4%) and upper aerodigestive tract (23.1%). Tumours were classified according to Broder's and Bryne's classification. 12 cases graded as moderately differentiated by Broder's system were categorized as low-grade malignancy grade (grade I of Bryne's) in our study considering the histological invasive parts of tumour and other parameters. This new malignancy grading system can change the course of treatment of cancer patients and might give a better outcome. It would be more economical and will save time.

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I. Introduction

Squamous cell carcinoma (SCC) is an epithelial malignancy that occurs in organs that are normally covered with squamous epithelium which includes several different anatomic sites and is the most common cancer capable of metastatic spread.¹

Development of early diagnostic methods and novel therapeutics are important for prevention and mortality reduction¹. In 1927, Broder initiated histological quantitative grading of cancer based on the proportion of the neoplasm resembling normal squamous epithelium. On the other hand, Bryne developed a simple morphological malignancy grading system that restricts the evaluation to the deep invasive front of the tumour⁴.

II. Material And Methods

The present study was conducted in the Department of Pathology at Subharti Medical College and associated ChhatrapatiShivaji Hospital, Meerut. A Retrospective and Prospective study was done from June 2014 – May 2017. Total 173 cases were collected. Clinical details were recorded. The tissue was fixed in 10% buffered formalin.

Gross findings of the tissue were recorded, representatives sections were taken from specimens and biopsy was processed as such. Conventional histo-processing in automated tissue processor was performed. The paraffin embedded sections was cut at 4 to 5 micron.

Slides were stained by routine H&E staining technique. For retrospective study, clinical details, paraffin blocks and slides were taken from the archives and further analysed.

All the lesions were categorised according to anatomical sites-Oral cavity(Anterior 2/3 of tongue, buccal cavity, tonsil and alveolus), Upper Aerodigestive Larynx- (Epiglottis, Supraglottis, Glottis and Subglottis) Oropharynx (Base of tongue, Tonsils and Posterior 1/3 of palate), Lung, Skin, Male genital tract (penis), Female genital tract- (cervix), Gastrointestinal tract (Oesophagus and Anorectal junction), Eye-Conjunctiva.

Tumours were graded on H/E slides according to Broder's grading as well, moderate and poorly differentiated carcinoma, and in Bryne's as grade I (4-8), grade II (9-12), and grade III (13-16)⁵. For grading, the total score of Bryne's parameters were calculated (Table 1).

Table 1-Bryne's (1992) Invasive Tumour Front Grading System⁶

Morphologic feature	1	2	3	4
Degree of keratinization	Highly keratinized (>50% of the cells)	Moderately keratinized (5-20% of the cells)	Minimal keratinization (5-20% of the cells)	No keratinisation (0-5%)
Nuclear polymorphis	Little nuclear polymorphism (>75% mature cells)	Moderately abundant nuclear polymorphism (50-75% mature cells)	Abundant nuclear polymorphism (25-50% mature cells)	Extreme nuclear polymorphism (0-25% mature cells)
Pattern of invasion	Pushing, well delineated infiltrating borders	Infiltrating, solid cords, bands and or strands	Small groups of cords of infiltrating cells (n>15)	Marked and widespread Cellular dissociation in small groups of cells (n<15) and or in single cells
Host response (Lympho-plasmacytic infiltrate)	Marked	Moderate	Slight	None

III. Result

Out of 173 cases the maximum cases were from oral cavity (32.4%) followed by upper aerodigestive (23.1%) and skin (12.1%). Lung and Female genital tract accounted for (11.6%) each. While male genital tract, gastrointestinal tract and eye (conjunctiva) constituted 4.6%, 3.5% and 1.2% cases respectively. According to Brode's grading system, out of 173 cases, moderately differentiated squamous cell carcinoma were 72.3%, well differentiated squamous cell carcinoma were 23.7% and poorly differentiated squamous cell carcinoma were 4.0%. (Table- 2)(Graph 1).

According to Bryne's classification (table 3)(Graph 2): 1. Degree of keratinization- score four (28.3%), score three (48.0%), score two (13.9%) and score one (9.8%).

2. Nuclear polymorphism- score four (3.5%), score three (38.2%), score two (34.7%) and score one (23.7%).

3. Pattern of invasion- score four (7.0%), Score three (10.4%), score two (61.3%) and score one (21.9%).

4. Host response (Lympho-plasmacytic infiltrate) - score four (5.7%), score three (19.7%) score two (34.1%) and score one (40.5%).

On the basis of total scoring, Group I includes 53/173 (30.6%), group II includes 113/173 cases (65.3%), while the rest of the cases fall in group III 7/173 cases (4.0 %). In correlation of histological grade (bryne's) with Broder's -grade I 41/53 cases were of well differentiated SCC and rest were of moderately differentiated SCC. Grade II has all 113 cases of moderately differentiated SCC. Grade III consists of 7 cases of poorly differentiated SCC.

DIFFERENTIATION	Well	%	Moderate	%	Poor	%	Total	%
ORAL CAVITY	18	32.1	36	64.3	2	3.6	56	32.4
UPPERAERODIGESTIE	2	5.0	36	90.0	2	5.0	40	23.1
SKIN	10	47.6	7	33.3	1	4.8	21	12.1
LUNG	1	5.0	17	85.0	2	10.0	20	11.6
MGT	5	62.5	3	37.5	0	0.0	8	4.6
FGT	4	20.0	16	80.0	0	0.0	20	11.6
GIT	1	16.7	5	83.3	0	0.0	6	3.5
EYE	0	0.0	2	100.0	0	0.0	2	1.2
TOTAL	41	23.0	125	72.3	7	4.0	173	100.0

Table-2 Grading Of Squamous Cell Carcinoma In Anatomical Site According To Broder's

Graph 1: Grading Of Squamous Cell Carcinoma In Anatomical Site According To Broder's

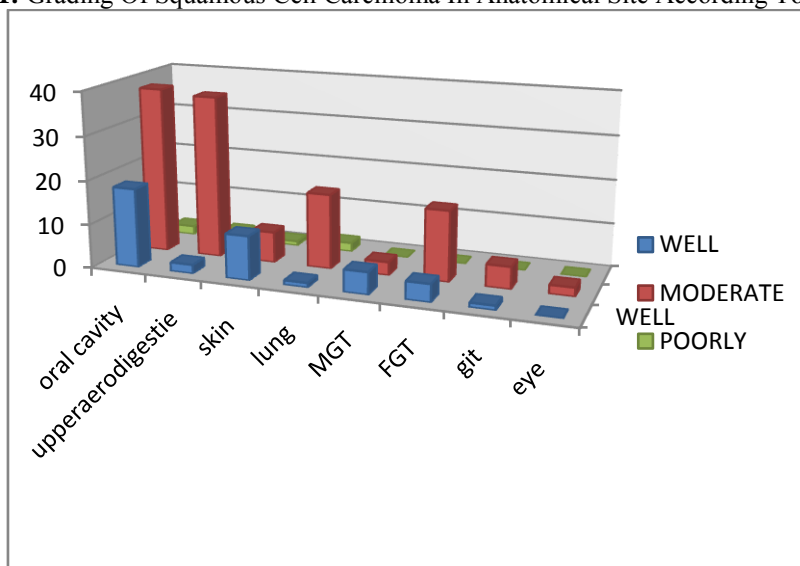
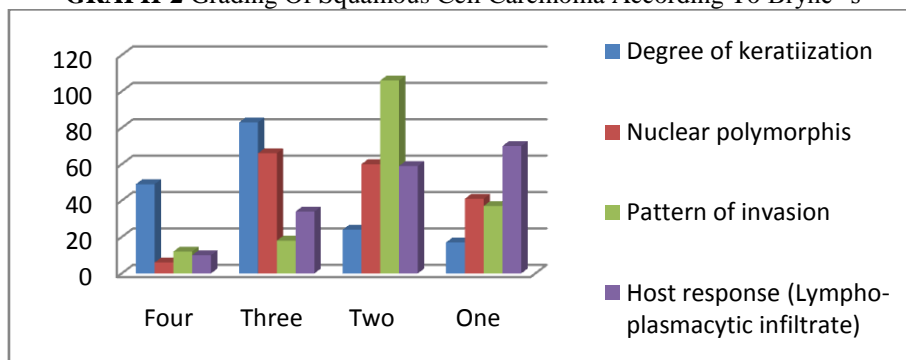


TABLE-3 Grading Of Squamous Cell Carcinoma According To Bryne's

Score	Four	Three	Two	One
DOK	49	83	24	17
NP	6	66	60	41
PI	12	18	106	37
HP	10	34	59	70

GRAPH-2 Grading Of Squamous Cell Carcinoma According To Bryne's



IV. Discussion

In our study histological grade in majority of the tumors were moderately differentiated tumors (125/173 cases -72.3%) followed by the well differentiated tumours 41/173 (23.7%). Similar finding were observed in Sharma M et al³ study conducted on 198 patients in which 160 (81%) were moderately differentiated squamous cell carcinoma, 33 (16.5%) were well differentiated and 5 cases (2.5%) were poorly differentiated squamous cell carcinoma. Ramasamy Pet al⁷ documented in their study that many classifications are available, but the WHO classification (Broder's grading) is the widely used classification system in clinical practice.⁸ In our study, grading of carcinoma was done according to Bryne's classification- maximum cases were with minimal degree of keratinization followed by no keratinization. Abundant to moderate nuclear polymorphism was commonly seen (score two and score three). Most common pattern of invasion was cords and sheets type of cells (score two). Host response (Lympho-plasmacytic infiltrate) was low in majority of cases (score one followed by score two). Our finding coincided with Dissanayake U et al⁹ study, where degree of keratinization (score four) was common (85%). In nuclear polymorphism common score was two and three (36.6% and 31.6%). Host response (Lympho-plasmacytic infiltrate) was minimum (score one). But our finding differs in pattern of invasion as in our study common score was two whereas in their study score four and score three was commonly encountered. But our finding coincided with Odell WE et al¹⁰ where score two (for pattern of invasion) was assigned to maximum cases (45.0%). Grouping was done on the basis of total score. Our findings were similar to Dissanayake U et al⁹ study -maximum cases were in group III followed by group II. 12 cases were graded as moderately differentiated by Broder's system which in our study were upgraded to

grade I of Bryne's system. According to Vasconcelos MG et al¹¹ study cases with a total score of 4 to 8 (grade I) were classified as low-grade malignancy, and cases with a total score higher than 8 were classified as high-grade malignancy. This indicates that histologically invasion of tumors cells may change the course of treatment which may result in better outcome⁵. Due to this new malignancy grading system which considers the histologically invasive parts of tumour-Bryne's classification was superior to Broders' system for the grading of SCCs.

V. Conclusion

SCC most commonly involves the oral cavity and Bryne's malignancy grading system can be performed on any routine H&E section of SCC, in any laboratory without any special techniques. It is economical, superior to Broder's system and less time-consuming technique which is most crucial for prognosis and can contribute for the better treatment of patients.

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