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GLEASON GRADING - SIMPLIFIED APPROACH TO PATEINT'S UNDERSTANDING OF PROSTATE CANCER

Pathology

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ABSTRACT

Despite significant changes in the clinical and histologic diagnosis of prostate cancer, the Gleason grading system remains one of the most widely accepted prognostic predictors in prostate cancer. The accurate diagnosis and grading of prostate cancer deeply impacts patient's prognosis and therapeutic options.

Method :- This retrospective study was conducted in a tertiary health care centre over a span of two years on patients earlier diagnosed with prostate adenocarcinoma were graded according to Gleason Grading of Prostatic carcinoma to the latest modifications from the 2014 International Society of Urological Pathology Consensus Conference on Gleason Grading of Prostatic Carcinoma. Follow up of patients was done to assess the prognosis and morbidity free survival.

Result – In our study out of 62 patients, highest frequency of 24 cases were assigned Gleason grade 5 and were associated with increased morbidity and reduced survival rate. Gleason score 7 (3+4) and Gleason score (4+3) were assigned Gleason grade 2 and 3 respectively. Gleason grade 2 had better prognosis than Gleason grade 3 patients.

Conclusion: As this new grading system is easy to understand and more accurately reflects prostate cancer disease progression, it is recommended by the World Health Organization (WHO) to be used in conjunction with Gleason score.

KEYWORDS

Prostate cancer, Grading, Prognosis

INTRODUCTION

The Gleason grading system for prostate adenocarcinoma originated in the 1970s from a pioneering randomized, well-controlled, prospective study initiated by Dr.Donald Gleason, in which over 2,900 patients were included. According to this system histological growth patterns were summarized as grades of prostate adenocarcinoma, and correlated with clinical data such as staging and prognosis.[1]

Although numerous other grading systems have been proposed or used over the last few decades. WHO has endorsed the latest Gleason grading system in the 2016 classification of prostate cancer, and it has also been incorporated into the AJCC/UICC staging system, as well as the NCCN guidelines as one of the key factors [together with serum prostate specific antigen (PSA) and staging] in treatment decision. [2]

The classical Gleason system comprises five histological growth patterns (grades). Gleason 1 represents the best differentiated with the most favourable prognosis, whereas Gleason 5 the least differentiated and associated with poor prognosis. As many prostate adenocarcinomas harboured two or more Gleason patterns, the Gleason score was developed, which was shown to correlate with the biological behavior of prostate adenocarcinoma even better. The sum of the primary (e.g., Gleason 3) and secondary (e.g., Gleason 4) patterns (grades) yields the Gleason score (e.g., Gleason score =3+4=7). In those cases with just one pattern, e.g., 3, the primary and secondary patterns are considered the same, yielding a Gleason score of 3+3=6.[3]

Reporting Gleason grade/score It is essential to recognize the basic rules of the modified Gleason system, as well as the differences in reporting on different types of samples.

The most important development of the meeting is the proposal of a new prognostic grade grouping system, which may have major impact on practicing pathologists and clinicians. In this new system, Gleason scores less than or equal to 6 are to be lumped into prognostic grade group I, Gleason score 3+4=7 to group II, Gleason score 4+3=7 to group III, Gleason score 4+4=8 to group IV, and Gleason score 9-10 to group V.[4] This is basically a new grading system, although it is based on Gleason patterns, together with which it is to be used for the time being. Since the new "Grade Group" system has been incorporated into the new edition of World Health Organization classification of prostate tumors (released in January 2016) clear understanding of the system by both pathologists and clinicians is essential.

METHODS:

This retrospective study was conducted in a tertiary health care centre over a span of two years on patients earlier diagnosed with prostate adenocarcinoma and classified on basis of Gleason Scoring were reclassified as per recently modified Gleason Grading system. Sixty two cases of Prostatic carcinoma biopsies were analysed. These included trucut biopsies and prostatectomy specimens.

Table 01 Age distribution

Age	Cases	%
50-60	9	14.51
61-70	27	43.54
71-80	16	25.8
81-90	10	16.2
TOTAL	62	100

In each case the architecture of acini, nuclear features, and stroma were studied and prostatic carcinoma cases were grouped into 5 grades according to Gleason scoring system.

Table 02 Distribution of prostatic carcinoma cases according to Gleason score

Gleason score	Cases	%
6	**1**	**1.61**
7	**11**	**17.74**
8	**21**	**33.84**
9	**24**	**37.8**
10	**05**	**8**

Table 03 Comparison of Gleason scoring with Gleason Grading

Gleason Score	Frequency	Gleason Grade
6	1	1
7 (3+4)	7	2
7 (4+3)	4	3
8	21	4
9	24	5
10	05	5

Gleason grading of prostatic adenocarcinoma can typically be performed using the 4x objective, although there may be certain instances (i.e. back-to-back glands vs. fused glands) that require higher magnification at 10x objective. Gleason scores should be reported as a mathematical equation, for example, Gleason score 4 + 3 = 7, so as to avoid ambiguity.

As per the new grading system the grading system includes five distinct Grade Groups based on the modified Gleason score groups. Grade Group 1 = Gleason score ≤ 6, Grade Group 2 = Gleason score 3 + 4 = 7, Grade Group 3 = Gleason score 4 + 3 = 7, Grade Group 4 = Gleason score 4 + 4 = 8, Grade Group 5 = Gleason scores 9 and 10.

In our study we had 11 cases which were given gleason score 7 but according to gleason grade 7 cases were assigned gleason grade 2 and 4

patients were assigned gleason grade 3. Upon follow up of patients 5-year risk-free survival for the 5 Grade Groups based on radical prostatectomy grade were 93, 87, 62, 49, and 25 %, respectively.

The Grade Groups were in conjecture with prognostic curves on biopsy in men treated with radiation +/− hormonal therapy as well as radical prostatectomy.

DISCUSSION

Although timely revisions have improved the Gleason grading system, it continues to have limitations. Modifications made in Gleason grading system (2005) made it much more complex than its original version. This complexity made it confusing for patients and clinicians. For instance, Gleason score 6 is recommended as the lowest grade to be assigned on prostate biopsy. This is counterintuitive in that the Gleason scale ranges from 2 to 10. Patients may assume that a diagnosis of Gleason score 6 on biopsy means their tumor is towards the aggressive range rather than having the best prognosis. In addition, many former Gleason score 6 tumors are now reclassified as Gleason score 7 in the modified system. Modern Gleason score 6 tumors have a much better prognosis than reported in the older literature. Studies shown that Gleason score 6 tumors are rarely associated with disease recurrence after radical prostatectomy and and also lacks the potential for lymph node metastases.[5-6]

In our study also patients having gleason grade 2 (3+4) had better prognosis than the patients having gleason grade 3 (4+3) which was associated with significantly increased morbidity.

Using this new system, patients could be reassured that they have a Grade Group 1 tumor on biopsy that is the lowest grade tumor possible, which in most cases can be followed with active surveillance. These Grade Groups were shown to be more accurate in predicting progression than the Gleason risk stratification groups (≤6, 7, 8–10). The Grade Groups showed similar prognostic curves on biopsy in men treated with radiation +/− hormonal therapy as well as radical prostatectomy. As this new grading system is simpler and more accurately reflects prostate cancer biology, we recommend using it in conjunction with Gleason score.This new grading system has been accepted by the World Health Organization (WHO) for the 2016 edition of Pathology and Genetics: Tumours of the Urinary System and Male Genital Organs[2]

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