

CASE STUDIES

# The correlation between the Gleason score of a transrectal prostate biopsy and a radical prostatectomy pathological report in patients with localized prostate cancer

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## ABSTRACT

**Background:** The Gleason score is a major factor in determining the progress and outcome of a patient who has undergone a radical prostatectomy. There can be a discrepancy between the pre- and post-operative Gleason scores. Knowing the reliability of the Gleason score prior to surgery is a key factor in providing better treatment.

**Objective:** The purpose of this study is to compare the degree of the histological differentiation of the Gleason score in a transrectal prostate biopsy with the pathological report of the surgical specimen for patients who had a radical prostatectomy operation.

**Materials and methods:** Of 33 patients who underwent a radical prostatectomy operation were included in a period from January 2009 to January 2014. These patients each had a pathological report of their transrectal needle biopsy (with a minimum of 10 cylinders) and of their radical prostatectomy as the surgical specimen. None of the patients had ever received oncology treatment prior to surgery. The Gleason score was used to observe the degree of differentiation. A comparison was performed between each patient's Gleason score from the transrectal biopsy and the post-surgical prostate specimen.

**Results:** In the transrectal biopsy, twenty-three patients (69.7%) received a Gleason score of 6, eight patients (24.2%) had a score of 7, and two patients (6.1%) had an 8. After the radical prostatectomy, fifteen patients (45.4%) showed a Gleason score of 6, eleven patients (33.3%) had a 7, six patients (18.2%) received a score of 8, and one patient (3%) showed a Gleason score of 9. No one received a Gleason score of 10.

**Conclusion:** Approximately 50% of the pre- and post-operative scores coincide. The transrectal biopsy tends to downgrade the Gleason score grade, as it is reported in the literature.

**Key Words:** Prostate-specific antigen, Gleason score, Transrectal biopsy, Radical prostatectomy, Pathological report

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### 1. BACKGROUND

The progress and outcome of a patient who has undergone a radical prostatectomy due to prostate cancer depends on several diverse factors. These include the prostate-specific antigen, whether it is organ-confined, if it has positive or negative surgical margins, and the specimen's degree of differentiation according to its Gleason score.<sup>[1,2]</sup> Both the prostate-specific antigen and the Gleason score are known prior to a radical prostatectomy. However, there can be a discrepancy in the pre- and post-operative Gleason scores, which could affect the patient's care plan.<sup>[3]</sup> It is essential to determine the reliability of the pre-operative Gleason score in order to provide the best treatment according to the patient's conditions. Due to this discrepancy, the objective of the study was to compare the degree of histological differentiation of the Gleason score from the transrectal prostate biopsy with the definitive pathological report from the surgical specimen in post-operative radical prostatectomy patients.

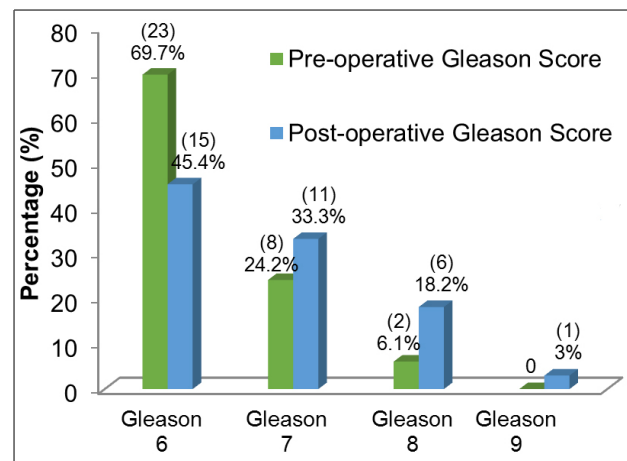
### 2. MATERIALS AND METHODS

The cases of 38 patients who received a radical prostatectomy from January 16, 2009 to January 16, 2014 were reviewed. Of the 38 patients in total, 36 received the operation through an open retropubic technique and 2 received a transperitoneal laparoscopic technique. Only 33 cases in total were considered in this analysis due to 3 of them not having a complete file and another 2 for the lack of neoplasm in the final specimen pathological report.

All of the remaining 33 patients had a pathological report for their transrectal biopsy with a minimum of 10 cylinder

samples (5 from each side, removed with an 18 gauge needle), as well as a report for the surgical specimen obtained from the radical prostatectomy procedure. None of the subjects received any type of oncology treatment prior to their surgery. The post-operative specimen slides were reviewed by a single pathologist. The degree of differentiation was determined with a Gleason score through the observation of the primary and secondary patterns. The highest Gleason score from the transrectal biopsy was reported, even though some specimens received a different score for each lobe of the prostate. The number of positive cancer cylinders and their respective percentages was recorded for each patient.

Contingency tables were used to express the frequencies and proportions in percentages.



**Figure 1.** Comparison of Pre-operative and Post-operative Gleason scores

**Table 1.** Comparison of Pre-operative and Post-operative Gleason scores

	Pre-operative Total	Gleason 6	Gleason 7	Gleason 8	Gleason 9
Gleason 6	23 (69.7%)	13 (39.4%)	6 (18.2%)	3 (9.1%)	1 (3.03%)
Gleason 7	8 (24.2%)	2 (5.7%)	4 (11.4%)	2 (5.7%)	0 (0%)
Gleason 8	2 (6.1%)	0 (0%)	1 (2.9%)	1 (2.9%)	0 (0%)
Gleason 9 and 10	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
Post-operative Total	33 (100%)	15 (45.4%)	11(33.3%)	6 (18.2%)	1 (3%)

### 3. RESULTS

The patients were initially classified according to the Gleason score from their transrectal biopsy. A Gleason score of 6 was reported for twenty-three of the patients (69.7%), a score of 7 for eight patients (24.2%), and a score of 8 for two patients (6.1%). No Gleason scores of 9 or 10 were obtained from the transrectal biopsy.

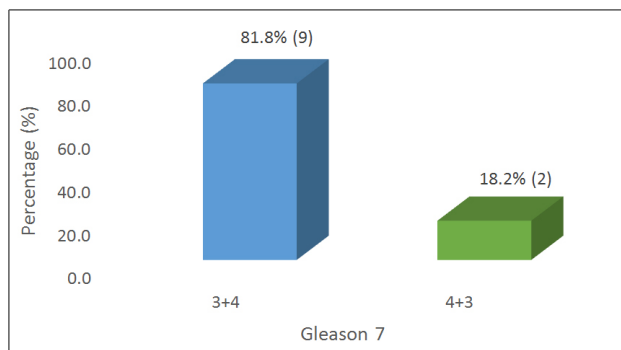
After the radical prostatectomy, the Gleason scores were calculated according to the surgical specimen received. Thirteen

patients (39.4%) were reported to have a Gleason score of 6, six patients (18.2%) with a score of 7, three patients (9.1%) obtained an 8, and one patient (3.03%) was reported with a score of 9. No patients received a Gleason score of 10 (see Figure 1, Table 1).

Of the 23 total patients who classified as pre-operative with a Gleason score of 6, only 56.5% (13) were classified with the same Gleason score after surgery. However, 26.1% (6) of them saw an increase in their Gleason from a 6 to a 7, 13.0%

(3) of the patients had an increase to an 8, and 4.3% of (1) of them increased to a 9. Of the eight patients initially classified as a pre-operative Gleason 7, 50% (4) remained at the same score of 7, 25% (2) increased to a Gleason 8, and the other 25% (2) saw a decrease in their Gleason score from an 8 to a 7. Of the two patients who originally received an 8 as their Gleason score, 50% (1) remained at the initial classification, while 50% (1) were downgraded to a Gleason score of 7.

Of the eleven patients who had a 7 as their post-operative Gleason score, 81.8% (9) of them classified as a Gleason 7 (3+4), while 18.2% (2) classified as a Gleason 7 (4+3) (see Figure 2).



**Figure 2.** Post-operative Gleason 7

#### 4. DISCUSSION

The correlation between the Gleason score from a transrectal biopsy and from the specimen of a radical prostatectomy rounds to 50%.<sup>[4]</sup> However, since the mid-1990s few studies have been conducted to demonstrate this correlation.<sup>[5]</sup> Algaba *et al.* reported that 45% of patients with a Gleason score of 6 retained the same classification, and 72.7% of patients with a Gleason 7 also retained their same score.<sup>[6]</sup> The largest series in the literature included 7,643 patients and showed that 36.6% of the patients with a Gleason score of 5-6 saw an increase in their score.<sup>[7]</sup>

A total of 56.5% (13) of the patients classified in this study as a Gleason 6 from the transrectal biopsy maintained their same score of 6 after the radical prostatectomy, while 43.4% (10) of them received an upgraded Gleason score. Epstein *et al.* showed that half of the cases with a 7 remained at the same score.<sup>[7]</sup> Algaba *et al.* reported a greater number in the consistency of cases with a Gleason 7 as 72.7%, where 77% were downgraded and 56% upgraded.<sup>[6]</sup> In this study of patients with a Gleason score of 7 from the transrectal biopsy, 50% (4) maintained the same score of 7, 25% (2)

were lowered to a 6, and 25% (2) of them were elevated to a Gleason 8. Epstein *et al.* reported that 66.7% of the transrectal biopsies originally scored at an 8 increased to a Gleason 9-10 in the pathological report from the prostate specimen.<sup>[7]</sup> In this study of the 2 patients with a Gleason score of 8 for their biopsy, 50% (1) were downgraded to a 7 and 50% (1) remained at the same score after their radical prostatectomy. This also correlated with the results reported by Donohue *et al.*,<sup>[8]</sup> which mention that 45% of the patients with a transrectal biopsy Gleason score from 8 to 10 are downgraded to a Gleason 7 or lower in the pathological report of the radical prostatectomy specimen. Similar to Donohue *et al.*,<sup>[8]</sup> Brimo *et al.* reports that 48% of the patients with a transrectal biopsy of a Gleason 8-10 are lowered to a Gleason score of 7 in the radical prostatectomy specimen. These results show that the number of cylinders involved with a higher degree of differentiation and the percentage of each cylinder are important factors to predict the final Gleason score of the radical prostatectomy specimen.<sup>[9,10]</sup> The incidence of vanishing prostate cancer is variable, from 0.86% reported by Sepúlveda *et al.*<sup>[11]</sup> up to 5.2% as reported by Truskinovsky *et al.*<sup>[12]</sup> However, this report shows an impact on 5.7% (2) of patients who continue to be monitored.

#### 5. CONCLUSION

Approximately 50% of the pre-operative scores coincide with the post-operative scores in this study, which are similar results as those found in the literature. However, it was shown that some specimens with an initial Gleason score of 7 and 8 were classified with a lower Gleason score after the radical prostatectomy.

The transrectal biopsy tends to be downgraded compared to the final Gleason score of the prostatectomy specimens, which shows the importance of considering this lower score upon implementing proper treatment for the patient.

The scoring of the transrectal biopsies before the radical prostatectomy allows the treating physicians to make more informed decisions regarding treatment options, as well as having a better understanding of the prognosis. Due to these reasons, standardizing the procedure of a transrectal biopsy is suggested.

#### CONFLICTS OF INTEREST DISCLOSURE

In no way were the authors sponsored during the completion of this article. The authors also declare that there are no conflicts of interest.

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