

## Anatomo-radiological correlation of prostate cancer: Experience within the University Hospital of Fez (about 36 cases)

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### Abstract

Prostate cancer is a real public health problem. It is the second most common cancer in men, due to longer life expectancy, especially in developed countries.

The diagnosis is confirmed by histology after the prostate biopsy, the latter also makes it possible to assess the severity by the Gleason score.

Multiparametric Magnetic Resonance Imaging (MRI) currently plays an important role in the detection and localization of intra- and extra-prostatic tumor foci by combining the 3 sequences (T2 sequence, diffusion sequence, perfusion sequence). This examination thus makes it possible to evaluate the severity of the tumoral lesion through the PIRADS score.

In our series, the PIRADS score varied between 3, 4 and 5.

We have illustrated through a review of the literature that multiparametric MRI data are correlated with prostate biopsy data. The presence of a clearly identifiable lesion on mpMRI is correlated with an increase in the Gleason score on the prostate biopsy.

In our study, it was shown that there is a statistically significant positive correlation between the PIRADS score and the Gleason score.

The use of multiparametric MRI of the prostate is therefore a good means of screening, diagnosis and locoregional extension of prostate tumors. However, its use remains limited by its availability and high cost.

**Keywords:** Prostate cancer; MRI; Gleason; Adenocarcinoma

### 1. Introduction

Prostate cancer is the most common cancer in men. Its partial prevalence at 5 years in 2012 is estimated according to the IARC (International Agency for Research on Cancer) at 3,857,500 cases worldwide and 5,935 cases in Morocco, i.e. respectively a proportion of 25.2% and 19.4% of human cancers, with mortality rates of 307,841 cases worldwide and 1,536 cases in Morocco.

Prostatic adenocarcinoma is the most frequent histological form, it constitutes between 90 and 95% of prostate cancers. It is a malignant transformation of glandular cells that gradually acquire the ability to multiply.

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At the early stage, this cancer is most often asymptomatic, hence the interest of screening by digital rectal examination and serum PSA assay in all people at risk.

At a more advanced stage, the disease can be revealed by non-specific symptoms or immediately by distant metastases.

Prostate biopsies confirm the diagnosis of prostate cancer and assess its aggressiveness using the Gleason score.

Multiparametric MRI has a dual interest: to diagnose and stage prostate cancer according to the PIRADS score, then to establish the indication to guide prostate biopsy.

Multiparametric MRI can detect intraprostatic tumor foci, and perform the loco-regional extension assessment. This is made possible thanks to the combination between these 3 essential sequences: T2 sequence, diffusion sequence and the dynamic sequence in three stages (arterial, portal and late)[2].

This is a retrospective epidemiological study which aims to establish the interest and the contribution of multiparametric MRI in the management of prostate cancer, as well as to study the correlation between the Pirads score resulting from prostate MRI and pathological Gleason score.

## 2. Material and methods

This is a descriptive retrospective study of 36 patients with one or more prostatic nodules between January 2019 and November 2022 who underwent multiparametric MRI and prostate biopsy at the University Hospital of Fez.

## 3. Results

**Table 1** Correlation between PIRADS and Gleason scores in the A. Fourcad series [1]

Score PIRADS	Score de GLEASON			
	No CaP	6	7	8-10
<2	67,1%	27,1%	2,9%	2,9%
3	66,7%	18,1%	15,3%	0
4	47,1%	13,7%	33,3%	5,9%
5	17,8%	20,5%	42,5%	19,2%
<b>TOTAL</b>	<b>49,6%</b>	<b>20,3%</b>	<b>22,9%</b>	<b>7,2%</b>

- **Prostate biopsy**

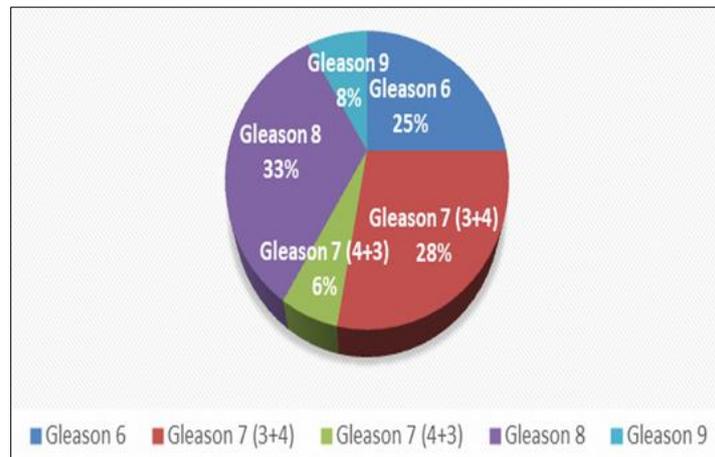
In our series, the histological type found is prostatic adenocarcinoma.

The number of cores taken for each patient is 12.4 on average (+/- 3.01) varying between 7 and 14 biopsies.

- **Gleason score**

The Gleason score is specified for our patients in all the anatomopathology reports.

The breakdown is as follows: (Figure 1)



**Figure 1** Gleason score of our patients

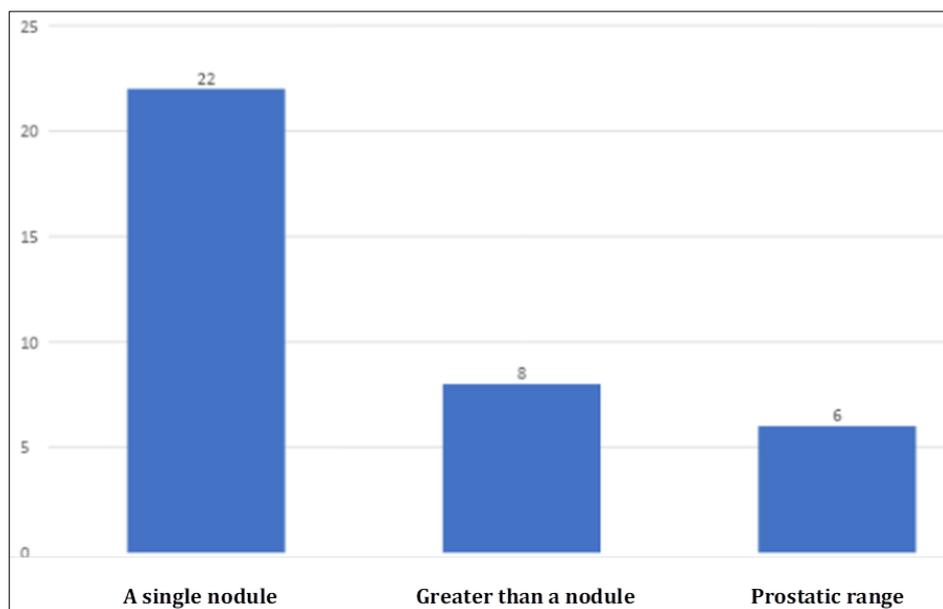
### 3.1. Multiparametric MRI data

Multiparametric MRI is performed in all patients in our series including: a T2 weighted sequence; a diffusion sequence and a contrast injection sequence.

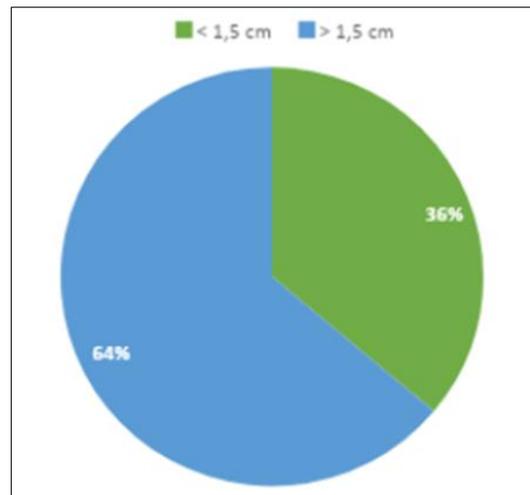
Description of the lesion and Focality:

In our series of 36 patients, 45 foci were detected and were distributed as follows:

- Twenty-two (22) patients have a single prostatic nodular focus.
- Six (06) patients had a prostatic patch.
- Eight (08) patients had more than one intra-prostatic nodular focus; of which seven (7) had two nodules and one had three nodules. (Figure 2) (Figure 3)



**Figure 2** Aspect of the MRI focal points in our patients



**Figure 3** Distribution of identified households by size in broadcast sequence

#### 4. Discussion

The age of our patients varies between 51 and 86 years old, with an average age of 70 years old. The majority of our patients present with urinary symptoms. Fourteen (14) patients have an abnormal rectal examination against nine (9) patients have a normal rectal examination, while thirteen (13) patients have no precision on the examination of the rectal examination.

The average PSA for our series is 52.7 ng/ml; with extremes ranging from 1.12 to 522.76 ng/ml

All our patients have benefited from prostate biopsy. The number of cores taken for each patient is 12.4 on average (+/- 3.01) varying between 7 and 14 biopsies

The Gleason score varies between 6 and 9.

25% of patients have a score of 6(3+3), 28% of patients have a score of 7(3+4), against 6% have a score of 7(4+3). 33% of patients have a score of 8(4+4), and 8% have a score of 9(4+5).

All our patients underwent multiparametric MRI. 64% of patients presented lesions of peripheral location, against 36% of lesions of central location. Most patients (89% of cases) presented a hyposignal in T2 sequence. Thirty-two (32) nodules appeared in marked hyperintensity on the high-b diffusion sequence versus four (4) nodules in discrete hyperintensity. 91% of patients showed early enhancement after the contrast injection sequence. [6]

The prostatic capsule is invaded in 56% of patients.

The seminal vesicles are invaded in eighteen (18) patients, of whom twelve (12) present an invasion of the left seminal vesicle and six (6) patients have an invasion of the right vesicle. Peri-prostatic fat is affected in 44% of patients in our series. 25% of patients present suspicious-looking adenopathies.

The PIRADS score varies between 3.4 and 5.

8% of patients are classified PIRADS 3 against 28% of patients classified PIRADS 4 while 64% of patients are classified PIRADS 5.

Eight (8) patients or 22% are classified as cT2b, ten (10) patients or 28% are classified as cT2c. Only one patient is classified as cT3a, nine (9) patients or 25% are classified as cT3b and eight (8) patients or 22% are classified as cT4.

According to our results, it was demonstrated that there is a positive correlation between the PIRADS score and the Gleason score. The absence of a clearly identifiable lesion on MRI is in favor of a low-risk tumor, conversely the presence of an identifiable lesion on MRI is correlated with an increase in the Gleason score on confirmatory biopsies.

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It has also been demonstrated that the risk of having secondary localizations for the PIRADS 5 score is higher than the PIRADS 4 score with an average of 57% versus 25% respectively. [5]

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## 5. Conclusion

The use of multiparametric MRI of the prostate in patients suspected of prostatic neoplasia based on clinico-biological criteria makes it possible to diagnose prostate cancer, to specify its locoregional extension, and to assess its severity by the PIRADS score. The new recommendations recommend the use of MRI before a series of biopsies for a better characterization of the lesions and their locations in order to optimize the results of the biopsies, but its application in our current practice remains limited by the high cost of this examination.

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## Compliance with ethical standards

### *Acknowledgments*

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### *Disclosure of conflict of interest*

No conflict of interest.

### *Statement of informed consent*

Informed consent was obtained from all individual participants included in the study.

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