Reevaluation of Unremarkable Prostate MRI in the Presence of Clinical Risk Factors

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Background

The Prostate Imaging Reporting and Data System (PI-RADS) assessment is associated with high expertise requirements and, consequently, considerable interobserver variability. The value of reevaluating multiparametric prostate MRI (mpMRI) without focal lesions in cases of persistent suspicion of prostate cancer (PCa) remains unclear.

Materials and Methods

Patients with clinical risk factors (e.g. suspicious PSA levels and/or rectal examination, positive family history for PCa; *Figure 1*) and an externally conducted MRI without focal lesions were referred for radiological reevaluation to our institution between January 2021 and July 2024. Following reevaluation, patients underwent either MRI fusion biopsy (FB) and systematic prostate biopsy (SB), SB alone (12–28 cores), or observation.

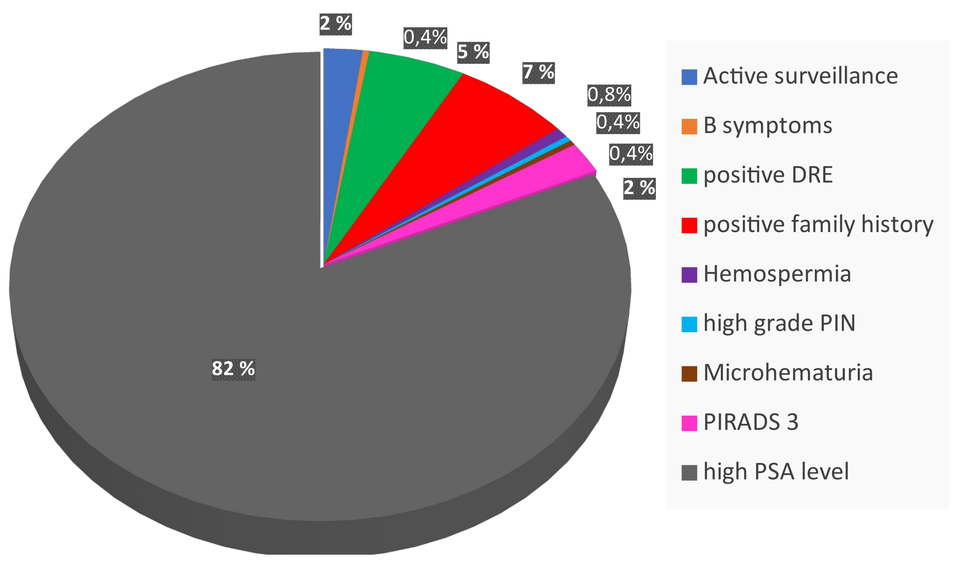
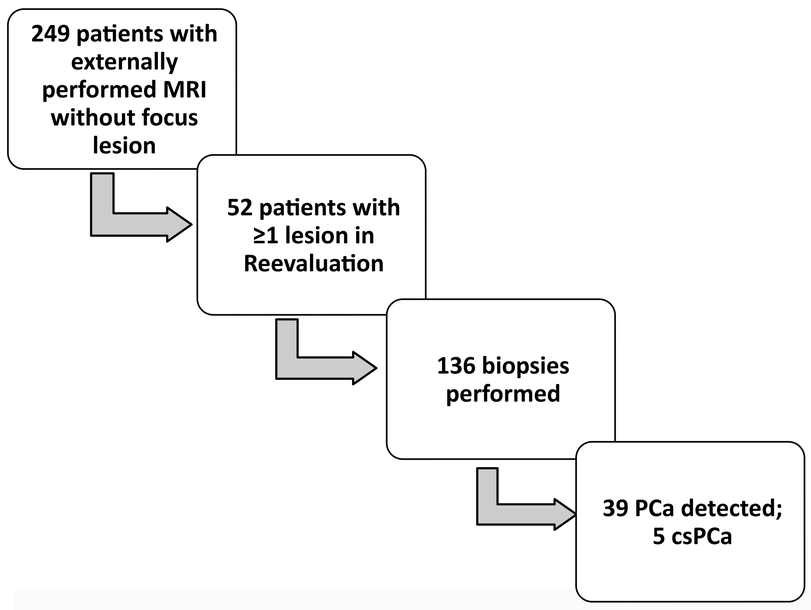


Figure 1: Reasons for admission

Results

- A total of 249 patients with an externally performed MRI without detected lesions were referred. In 52 patients, ≥1 focal lesion was identified and classified as PI-RADS 3 (n=34), 4 (n=17), or 5 (n=1). Biopsies were performed in 136 patients (median FB n=1.5, SB n=13). PCa was detected in 39 men, with clinically significant PCa (csPCa) in 5 men. (*Flowchart 1*)
- Neither the detection of a focal lesion in reevaluation nor the presence of csPCa post-FB/SB correlated with any of the initial referral risk factors.
- However, PSA density (csPCa 0.29 vs. no csPCa 0.13 ng/ml/cm³; p<0.001) and a PI-RADS upgrade in our reevaluation (p=0.007) were significantly associated with csPCa in men undergoing biopsy (*Table 1*)
- After biopsy, only increasing PSA density was associated with a higher csPCa risk in both univariate (p=0.005) and multivariate (p=0.02) analyses.



Flowchart 1: Reevaluation, performed biopsies and detected PCa

	Total study cohort (n=136)	csPCa (n=5)	No PCa (n=131)	p-value
cs PCa (%)	5 (4%)	5 (100)	131 (96)	
PSA level (median ± SD)	6 (± 4.3)	10 (± 6.4)	6 (± 4.2)	0.17
Prostate Density (median ± SD)	0.13 (± 0.1)	0.29 (± 0.2)	0.13 (0.08)	**<0.001**
Abnormal DRE	5(4)	0	5(4)	0.6
PCA family history (n,%)	17 (12.5)	1 (20)	16(12)	0.4
Upgrading PIRADS (n,%)	39 (29)	4 (80)	35(27)	**0.007**
Active Surveillance (n,%)	4(3)	0	4(3)	1

Table 1: Factors associated with detection of csPCa

Conclusion

- Following reevaluation of MRI scans without focal lesions in patients with clinical risk factors, a lesion was identified in one-fifth of cases. A clinically significant PCa was only detected in 4 %.
- Increased PSA density appears to correlate with csPCa detection.
- The number needed to screen (NNS) to detect one Patient with csPCa is 50.