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# Clinical Significance of MRI in Prostate Cancer Diagnosis

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## Description

Before practically any prostate biopsy, Magnetic Resonance Imaging (MRI) is advised as it has emerged as a crucial test in the diagnosis of Prostate Cancer (PCa). In an effort to improve the diagnosis of clinically Significant PCa (csPCa), research teams have recently merged MRI with prostate-specific membrane antigen positron emission tomography/computed tomography (PSMA PET/CT). Given the cost of PSMA PET/CT and its unavailability in some nations, its cost-effectiveness and viability as an addition to the MRI-based diagnostic method remain in doubt. Nevertheless, combining two sensitive tests offers, at least theoretically, one significant benefit: patients with negative results on both exams might be able to skip biopsy without risk.

Heetman is published in the October 2022 issue of European Urology Open Science. The possibility of treating patients with highly positive MRI results (e.g., a Prostate Imaging-Data and Reporting System [PI-RADS] score of 4-5) and PSMA PET/CT results (e.g., a maximal standardized uptake value [SUVmax] of 8 mSv) without tissue confirmation.

Based on a retrospective analysis of 459 patients who underwent both an MRI and a PSMA PET/CT at their institution, either for staging purposes or as part of an active surveillance trial, scientists come to their conclusion. A total of 185 patients (40.3%) demonstrated both positive PSMA PET/CT (SUVmax 8 mSv) and positive MRI (PI-RADS 4-5) results. 181 (97.8%) of the 185 patients had cancer that was Grade Group (GG) 2 by the International Society of Urological Pathology at the time of the biopsy.

In addition, 62 (88.5%) of the 70 patients with a PI-RADS grade of 4-5 on MRI and SUVmax 16 mSv on PSMA PET/CT had GG 3 malignancy. The concept of treating patients without histological evidence of cancer is not novel in medicine, although being controversial. The majority of renal masses are surgically removed without first undergoing a biopsy, as stated by the authors. Hepatocarcinoma can be detected in the existence of cirrhotic liver using computed tomography criteria without a biopsy.

Before treating patients merely on the basis of concordant prostate MRI and PSMA PET/CT findings, however, a number of variables urge caution. First, the analogies between the examples of renal masses and hepatocarcinoma are invalid. In cirrhotic persons, liver biopsy is associated to significantly higher morbidity than prostate biopsy, and hepatocarcinoma is highly common in cirrhotic livers. Because many benign renal masses grow over time and because robot-assisted nephron-sparing surgery does have a low morbidity, it is considered appropriate to extract a suspicious small renal mass that proves turned out to be benign. Radiation therapies for the prostate and radical prostatectomy on the other hand are associated with significant morbidity; subjecting a patient without PCa to these treatments does not seem appropriate. In light of this, PCa treatment without histological confirmation should only be considered in cases when the imaging diagnosis is almost certain. Is this a true statement?Indicate a Positive Predictive Value (PPV) of 97.8% (181/185) for GG 2 cancer with specificity of 96.6% (112/116) and sensitivity of 52.8%(181/343).

These outcomes are positive. But are they adequate? Would the urological community agree to have two out of every 100 patients undergo inappropriate chemotherapy or surgery for the prostate only to avoid a biopsy? Moreover, the prevalence of GG 2 cancer was high (74.7%, 343/459) due to the fact that every patient in the series studied by Heetman had been diagnosed with PCa. This is not typical of cohorts of patients who have been diagnosed with PCa, where the incidence of csPCa typically ranges from 35% to 55%. Sadly, the mathematical value of PPV declines with prevalence. The PPV for combining MRI and PSMA PET/CT in a population with a csPCa prevalence of 45% would be 92.7% when 52.8% sensitivity and 96.6% specificity are taken into account. Even though this remains relatively good, seven out of every 100 patients would now be undergoing unnecessary medication.

Nevertheless, this is perhaps an optimistic forecast. We should also evaluate the PSMA PET/CT, which is good but not perfect, and prostate MRI, whose inter-reader repeatability is at best moderate. Therefore, there is no assurance that less experienced institutions will be able to match the outstanding diagnostic specificity of combined MRI and PSMA PET/CT reported by expert centers in recent research. The csPCa is not a homogeneous entity, to sum up. The prognosis and required care vary among GG 2 cancers with cribriform/intra-ductal architecture, GG 2 cancers without cribriform/intra-ductal architecture, and GG 5 cancers.

Prostate biopsy can disclose guidelines on tumour activity that imaging is unlikely to disclose, at least in the near future, even though it is not a perfect method due to sample errors. As the authors point out, immunotherapy will lead to an increase in the use of DNA testing, and surgery is not the only option for treating PCa. Without a biopsy, no pathology information would be accessible following radiation or ablative therapy, which could be harmful if metastatic development occurred. The urological community is definitely faced with a significant issue in reducing the amount of needless prostate biopsies. Selecting the right patients for a biopsy can and will be aided by modern technology.

However, this will primarily be accomplished by better identifying patients who are at an extremely low risk of csPCa and who can safely forgo biopsy. Should patients who have extremely suspect imaging findings forgo biopsy as well? Given the generally safe profile of prostate biopsy, we think there is more to lose than gain in this situation. It is perhaps also important to keep in mind that medicine is about treating individuals, not their scans, in a time when images permeate every aspect of our lives.