Revisiting prostate cancer: Can we separate the wheat from the chaff?

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Prostate cancer remains a leading cause of death among men. It has always been a heterogeneous disease, the natural history being widely variable. There are many who, though diagnosed with the disease, die with cancer and not because of it and yet, the aggressive variants often metastasize early and are invariably fatal despite therapy.

The challenge has always been to detect and treat clinically significant prostate cancer. Early detection will entail effective screening and a confirmed diagnosis. The means to do this still remains controversial. Prostate-specific antigen (PSA) has been much maligned as a screening tool.[1] It is neither specific for cancer nor confirmatory. Raised values will require biopsy confirmation.

The technique of the standard transrectal ultrasound (TRUS)-guided prostate biopsy was initially demonstrated in the pre-PSA era, the late 1980s when prostate cancer was mostly a high volume, palpable disease.[2] Apart from the addition of extra cores in an extended biopsy technique, the technique remains essentially the same; systematic and nontargeted. It samples only 0.04% of an average size prostate, mainly the posterior gland. There is inadequate sampling of anterior, midline, and the apex of the prostate.[3] Transperineal biopsy is an alternative systematic technique where saturation biopsy is possible. It may require anesthesia and both these techniques can increase the detection of insignificant prostate cancer by chance. Furthermore, in TRUS biopsy, 47% of lesions >0.5 ml and 79% of lesions of 0.2–0.5 ml size can be missed.[4]
Targeted biopsy of the prostate using multiparametric magnetic resonance imaging (mp-MRI) combined with conventional TRUS fusion shows promise. A combination of high-resolution morphological imaging using T2-weighted images and functional imaging with diffusion-weighted imaging and dynamic contrast-enhanced perfusion has demonstrated sensitivity of 74% with a specificity of 88%. Reports indicate that it was more effective in detecting small volume Gleason pattern ≥4 cancer, reducing chances of missed high-grade cancer. It has a lower sensitivity for lower grade (Gleason 3 + 3) lesions. There are also indications that functional imaging can predict tumor aggressiveness.\(^5\)

Magnetic resonance spectroscopy was a part of the initial protocol of mp-MRI. It is time consuming to process and expensive with low overall cost–benefit ratio. It is not commonly used as a part of the current mp-MRI protocols.\(^6\)

The real value is of mp-MRI directed fusion biopsy is perhaps in patients with a persistently raised or rising PSA despite previous negative TRUS biopsy.

Despite advantages of MRI-TRUS fusion biopsy, there are significant areas of concern. There is still not enough evidence to lay down clear guidelines for its use in routine patient care.

An ideal biopsy technique should detect high-grade cancers, avoid overdiagnosis, and reduce morbidity. At the moment, all centers using TRUS fusion biopsy the suspicious mp-MRI directed foci in addition to the 12-core standard systematic sampling. At present, the technique adds to the cores of a standard TRUS biopsy, negating the advantages of MRI targeting and increasing chances of harm. It requires a 1.5, preferably 3 Tesla MRI which may not be available at all centers. The heterogeneity of imaging quality between centers, the variable magnet strength, and the availability of endorectal or a surface coil (pelvic array) all add to the varying results and difficulty. The different machines used for TRUS fusion, software upgrades, protocols, and the nonavailability of skilled radiologists are significant challenges. There is a definite learning curve for prostate mp-MRI reporting.\(^7\) The standards for reporting are also being revised for accuracy and reproducibility. The current Prostate Imaging – Reporting and Data System version 2 differs significantly from the initial version.\(^6\) It is imperative for the radiologist to upgrade skills to be comfortable with the new technology.

Multiparametric-MRI imaging and its incorporation in TRUS fusion biopsy offers advantages over conventional biopsy. It is not, however, the panacea for all the ills of prostate screening. It is definitely not a screening tool despite the efforts of market forces to portray it as such. It is however likely to be quite useful in active surveillance protocols.

In this issue of the journal, Bansal \textit{et al.}\(^8\) have described their experience regarding the usefulness of mp-MRI TRUS fusion biopsy in Indian patients and compared it to traditional TRUS biopsy. Further evidence and clearer guidelines in the future will enable us to better define its role in prostate cancer treatment.

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REFERENCES


