

Smarter, Not More: The Rationale for Reducing Systematic Cores in the MRI-Targeted Biopsy Era

We read with great interest Deng et al.'s study¹ comparing sextant (6-core) and 12-core systematic biopsy in the MRI-targeted era, which valuably challenges the "more cores = higher accuracy" dogma by proposing a precision sampling strategy based on prostate cancer's spatial distribution, aligning with personalized diagnosis trends. Methodologically, the 6-core protocol is a rational optimization (not arbitrary reduction): as 70%–80% of clinically significant prostate cancer (csPCa) localizes to the peripheral zone (PZ), 20%–30% to the transition zone (TZ), and over 80% of multifocal lesions cluster in bilateral PZ/midline, its "bilateral PZ (2 cores each) + TZ (1 core each)" design targets these high-risk areas, laying an anatomical basis for non-inferiority to 12-core biopsy. Clinical validation confirms this: comparable csPCa detection rates (54.3% vs. 54.8%); the 6-core group's lower additional diagnostic value (2.0% vs. 4.0%) was statistically insignificant with only low-risk missed cases (ISUP GG \leq 2); and similar biopsy-pathology grade concordance ($\kappa = 0.50$ vs. 0.55) and extra-index csPCa detection (29.3% vs. 30.8%). Consistent with the "saturation threshold" theory (minimal csPCa detection gain beyond 8 cores but increased complications), the 6-core protocol balances diagnostic efficacy and patient safety, supported by acceptable complication rates (70.6% vs. 66.1%) and postoperative VAS pain scores (3.0 vs. 2.0).

Nonetheless, the study has critical limitations that merit in-depth discussion, and further core reduction (to 4 or 2 cores) faces inherent clinical challenges.^{2,3} While reducing core numbers may theoretically minimize procedural discomfort and lower pathological processing costs (a 33.3% cost reduction was reported in the 6-core group), Deng's study lacks site-specific positivity rates, which limits the accurate assessment of the feasibility of further reduction. More importantly, it remains unclear whether csPCa detected by systematic biopsy but missed by targeted biopsy are adjacent to targeted lesions, raising a key clinical question about the rationality of replacing whole-gland systematic biopsy with ipsilateral regional biopsy or perilesional sampling.⁴⁻⁶ Specifically, three major barriers preclude hasty core reduction: first, multiparametric MRI (mpMRI) has limited sensitivity (~65%) for detecting non-index lesions, making systematic biopsy indispensable for compensating imaging omissions—for instance, 7.1% of patients with MRI-suggested unilateral lesions had actual bilateral disease, and 15.0% of csPCa were detected via contralateral PZ sampling in the 6-core group; second, multifocality and non-index lesions have significant clinical implications, with 91.1% of radical prostatectomy specimens showing bilateral disease and 29.3% harboring extra-index csPCa (which correlates with extracapsular extension and elevated biochemical recurrence risk), and reducing to 4 cores would lower PZ sampling proportion from 66.7% to 50%, increasing the risk of missed diagnosis in the PZ upper-outer quadrant and apex; third, the 6-core protocol may represent the "minimum effective threshold" for initial biopsies, and its efficacy may be compromised in specific populations such as patients with multifocal MRI lesions, prostate-specific antigen <10 ng/mL, or previous negative biopsies.

Thus, further core reduction is not optimal, and personalized sampling based on individual patient features should be prioritized.⁷ Key optimizations include imaging-guided dynamic core adjustment, biomarker-integrated reduction, and biopsy history-stratified sampling. In conclusion, Deng et al.'s study provides valuable

evidence for prostate biopsy optimization, and future studies should develop multidimensional models integrating imaging, biomarkers, and clinical features to advance personalized biopsy, with prospective multicenter trials validating these strategies' generalizability and long-term oncological impact.

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