EDITORIAL

Clinical

Transrectal prostate biopsy: easy, effective and safe

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Historically, the transrectal biopsy approach faced skepticism due to concerns about fecal contamination and subsequent infection, leading to a preference for the transperineal approach. The transition gained momentum in the 1950s, with increasing recognition of transrectal biopsy's potential for enhanced precision in prostate cancer detection. The advent of ultrasound imaging, notably described by Takashi and Ouchi in 1963, marked a pivotal moment, gradually supplanting other approaches. The 1980s witnessed a significant leap with the introduction of a 7 MHz transrectal ultrasound probe equipped with attachable needle guides, firmly establishing the technique in urological practice. As the landscape of prostate cancer diagnosis continues to evolve, two primary approaches, transrectal and transperineal biopsy, stand at the forefront of the debate. Contemporary guidelines exhibit a dichotomy in approach recommendations. The European Association of Urology (EAU) advocates for transperineal biopsy, citing lower infection risks and readmission rates, while the American Urological Association (AUA) maintains a neutral stance, citing a lack of randomized trials comparing infection rates [1, 2]. Ongoing debates fuel a dynamic landscape, necessitating continuous evaluation of the most suitable approach.

A comprehensive survey involving 658 urologists trained in both the United States and Europe unveiled a noteworthy revelation: fewer than half reported exposure to transperineal biopsy techniques. Intriguingly, this data exhibited considerable heterogeneity among the surveyed countries [3]. Moreover, those urologists who underwent training involving transperineal biopsy were significantly more inclined to express intent in conducting transperineal biopsies post-training. This correlation underscores the pivotal role of senior urologist-led training programs, highlighting their potential influence on shaping the future landscape of urological practices. Two recent protective randomized trials, PREVENT and ProBE-PC, provide insights into safety and infection rates associated with transrectal biopsy.

The PREVENT multicentric trial, encompassing 658 patients, compared transperineal and transrectal biopsies with a primary focus on post-biopsy infection rates at 7 days [4]. Noteworthy was the prescription of fluoroquinolone antibiotics in the transrectal arm, contingent upon rectal cultures showing no resistance. Approximately 15% of patients exhibited rectal culture-fluoroquinolone resistance, prompting alternative antibiotic administration based on sensitivities. The study revealed no significant difference in infection rates (0% vs. 1.4%, $p = 0.059$) and clinically significant prostate cancer (csPCa) detection rates (53% vs. 50%) between transperineal and transrectal approaches. A single case of urinary retention was reported in the transperineal arm, with peri-procedure pain resolving within 7 days.

The ProBE-PC monocentric trial, encompassing 753 patients, focused on the 30-day composite infection rate, including fever, genitourinary infection, antibiotic prescription, emergency visits, hospitalization, or sepsis [5]. In the transrectal arm, antibiotics were prescribed without rectal cultures, utilizing augmented oral therapy (i.e., ciprofloxacine 500 mg and SMZ-TMP 800–160 mg 1 h before and 12 h after) in 78% and intramuscular ceftriaxone in 23% of patients based on perceived resistance risks. Notably, four patients in the transperineal arm received antibiotics. The study reported no sepsis or hospitalization and found no significant difference in composite infection rates (2.7% vs. 2.6%, $p = 0.89$) between transperineal and transrectal approaches.

These trials collectively underscore the feasibility of targeted or augmented prophylaxis in transrectal biopsy, challenging traditional concerns about infection risks [6, 7]. The results suggest that, despite the backdrop of high fluoroquinolone-resistant E. Coli rates in the region of interest (i.e., 30–35% in the ProBE-PC population), effective prophylaxis strategies can mitigate infectious complications. However, caution is warranted in interpreting these results due to the absence of rectal cultures in the ProBE-PC trial, coupled with an unexpectedly low infection rate in the transrectal arm compared to previous studies [8, 9]. Moreover, only first-time prostate biopsy patients were included in the PREVENT trial and most of the patients in both trials were Caucasians, reducing the generalizability of the results.

The European Commission's stringent regulatory conditions have prompted a critical reevaluation of antibiotic prophylaxis protocols during prostate biopsy [10]. A key turning point emerged with the suspension of fluoroquinolone indications, prompting a shift away from conventional practices. The suspension, grounded in concerns over antibiotic resistance, has significant ramifications for the management of infection risks associated with transrectal biopsy. In response to these regulatory changes, EAU has adapted its guidelines, advocating for alternative options such as targeted and augmented prophylaxis, as well as alternative antibiotics (e.g., fosfomycin, cephalosporins and aminoglycosides) [1]. Aforementioned studies confirm the safety of these recommended antibiotic strategies.

In term of csPCa detection rate, the existing body of literature has predominantly relied on retrospective studies characterized by varying sample sizes. While no clear statistically significant difference between transrectal and transperineal approaches has emerged, a discernible trend suggests potential advantages in certain scenarios [11–13]. Indeed, studies suggest that the detection rates may be influenced by the precise localization of MRI-suspicious lesions within the prostate. Notably, lesions located at the apex or anterior part of the prostate, or those measuring less than 15 mm with MRI-suspicion (i.e., PI-RADS 4), exhibit a trend towards improved detection rates with transperineal biopsy. On the other hand, the advent of advanced magnetic resonance imaging (MRI)/ultrasound images fusion platforms has

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substantially improved the precision of transrectal biopsy [14, 15]. These technological advancements have particularly enhanced the ability to target suspicious lesions effectively, especially when located in apical or anterior regions.

The adoption of transperineal biopsy brings with it additional costs that warrant careful consideration. The shift necessitates investments in a new biopsy platform or at least software updates, dedicated ultrasound probes with eventually holding arms, tables with leg support for lithotomy positions, and specialized biopsy grids (e.g., PrecisionPoint®) [16]. Moreover, physicians, accustomed to years of practicing and perfecting the transrectal technique, face the challenge of abandoning established habits and navigating a new learning curve [17].

The prevailing trend in favor of local anesthesia for transperineal biopsies is evident, yet some practitioners persist in opting for general anesthesia, thereby contributing to extended procedural durations within the operating room [18]. For those who adhere to the practice of transperineal biopsies under local anesthesia, it is imperative to conscientiously consider the pain associated with this approach [19]. This pain may manifest both during the administration of anesthesia and the biopsy procedure, with a significant difference compared to the discomfort experienced in transrectal biopsies [4].

In conclusion, recent level 1a evidence reaffirms the safety and efficacy of transrectal biopsy, if a judicious antibiotic prophylaxis strategy is employed. Despite the ongoing debate surrounding the detection of csPCa, the lack of high-level evidence suggests a need for continued research. In this context, the transrectal approach remains an easy, effective and safe technique.

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AUTHOR CONTRIBUTIONS

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COMPETING INTERESTS

The authors declare no competing interests.