

Impact of Biopsy Strategy on Prostate Cancer Detection Rates

Emiliozzi P, Scarpone P, DePaula F, et al. The incidence of prostate cancer in men with prostate specific antigen greater than 4.0 ng/mL: a randomized study of 6 versus 12 core transperineal prostate biopsy. *J Urol* 2004;171:197–9.

Study Overview

Objective. To compare cancer detection rates from 6- and 12-core transperineal biopsies in patients with elevated prostate-specific antigen (PSA) levels.

Design. Prospective, randomized trial.

Setting and participants. 214 consecutive patients with PSA values > 4.0 ng/mL presenting to a Rome, Italy, hospital between February 2001 and December 2002.

Methods. Patients were randomized to either 6- or 12-core transperineal biopsy. All patients underwent prebiopsy evaluation with digital rectal examination (DRE) and transrectal ultrasound (TRUS). Positive DRE was defined as a firm, palpable nodule and/or prostate enlargement. Positive TRUS was defined as a distinct hypoechoic peripheral nodule or extensive hypoechoic band involving the whole peripheral zone. Biopsies were performed on an outpatient basis using a fan technique with 2 puncture sites slightly above the rectum (1 per lobe) under TRUS guidance. Cores were taken from all peripheral areas. In the 12-core technique, additional intermediate cores were obtained. DRE, TRUS, and biopsies were performed by the same urologist.

Main outcome measure. Cancer detection rates.

Main results. The 6- and 12-core biopsy groups were comparable in terms of age (median age, 67 and 68 years, respectively) and PSA level (median, 8.2 and 8.0 ng/mL, respectively). The positive DRE rate for the 6-core biopsy group was 26 of 107 cases (24%) versus 31 of 107 (29%) for the 12-core biopsy group ($P = 0.185$), and the positive TRUS rate was 27% versus 33% ($P = 0.219$) for the 6- and 12-core groups, respectively. PSA was between 4.1 and 10 ng/mL in 65% of the 6-core group and in 67% of the 12-core group ($P = 0.386$). The overall cancer detection rate was 38% for the 6-core biopsy group and 51% for the 12-core biopsy group ($P = 0.0272$). In patients with PSA between 4.1 and 10 ng/mL, the cancer detection rate was 30% for the 6-core group and 49% for the 12-core group ($P = 0.016$). The median

Gleason score was 6 (range, 5–9) for the 6-core group and 7 (range, 5–10) for the 12-core group ($P = 0.292$). The complication rate was similar in both groups. Mild and transient (1–7 days) initial hematuria occurred in 43% and 45% of patients in the 6- and 12-core groups, and recurrent hematospermia up to 3 months in duration occurred in 74% and 79%, respectively. No patient had postoperative fever or urinary retention or required hospitalization.

Conclusion. The 12-core transperineal prostate biopsy is superior to 6-core biopsy. Six-core prostate biopsy techniques should be avoided and considered outdated.

Commentary

Over 220,000 men are diagnosed with prostate cancer each year. Diagnosis often is based initially on an elevated PSA level or abnormal examination and confirmed with biopsy. However, some men with elevated PSA levels go on to have false-negative prostate biopsies. Biopsies consisting of less than 6 cores or small tissue specimens may lead to underdiagnosis and an increase in false-negative rates. Therefore, TRUS-guided sextant biopsies have been standard in the evaluation of suspected prostate cancer. Recently, studies have suggested that increasing the number of core biopsies leads to improvements in cancer detection rates, leading to a shift in practice [1,2]. However, another prospective randomized study of over 200 men with abnormal PSAs and/or DREs comparing 6- and 12-core transrectal biopsy strategies found identical cancer detection rates (26% and 27%, $P = 0.9$) [3].

Emiliozzi et al reexamine this issue using a newer transperineal fan approach. This study essentially addresses 2 important issues: the “6 versus 12” biopsy strategy and the

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role of a transperineal approach. In terms of 6 versus 12, taking more cores resulted in a statistically significant improvement in the rate of cancer detection. Specifically, the 12-core technique found a higher number of tumors in patients with negative DRE and TRUS findings. Importantly, in patients with positive DRE and/or TRUS results, the 12-core strategy did not improve the rate of cancer detection.

The study's primary strength is its randomized prospective design, which helped balance the groups in terms of baseline PSA levels and DRE/TRUS findings. However, several points should be considered when interpreting the results and conclusions. First, it is not clear whether the results are influenced by operator technique. Improved detection rates may have more to do with the technique of a skilled urologist who is able to perform a complicated 12-core technique (a technique uncommon in America) than with the number of biopsies itself. As well, is it surprising that the 12-core strategy found more cancer than the 6-core strategy? Looking harder for cancer should result in finding more cancer. The real questions are: What qualifies as a "thorough search" that ensures the gland has been adequately surveyed? More importantly, is it safe for patients? What is the "ceiling" in terms of biopsy number, short of a radical prostatectomy? Lastly, this was not a study comparing transper-

ineal and transrectal approaches. Perhaps a transperineal approach, which places greater attention on sampling apical/peripheral regions of the prostate where more cancers develop, will always outperform transrectal approaches regardless of biopsy number. Historical data suggest this may be true.

Applications for Clinical Practice

Increasing the number of core biopsies likely improves cancer detection rates. A transperineal biopsy approach is feasible and safe but is not yet standard in America.

—Review by David R. Spigel, MD

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