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"Prostate Biopsy: Emerging Concepts"

Tissue biopsy, reviewed by one or more pathologists, is the standard for diagnosing prostate cancer; nuances within the pathology report can help us advise the patient as to the severity/risk of his cancer and guide the man as to appropriate therapy, side effects thereof, and the chance of cure.

There are some men whom, without biopsy, we know have a 99+% chance of harboring a biologically significant prostate cancer. These individuals are often older and frail, and would not tolerate complications of a biopsy such as bacterial infection invading the bloodstream, without grave illness. They may have hard irregular prostates and high, escalating PSA's. Such men would not likely be curable with surgery or radiotherapy, but could die of the disease with no intervention. In my practice, I will offer such individuals hormonal therapy, e.g., with leuprolide acetate (depot Lupron) without requiring/abstracting a tissue biopsy first.

The whole issue of which (if any) men should be screened for prostate cancer and who benefits not only in terms of cure but extension of longevity (with hopefully a minimally altered quality of life) has been addressed by me in prior MEditorials and is obviously the subject on never-ending controversy. Let's just say that men with at least an otherwise (i.e., not considering that the subject may have prostate cancer) 15 year life expectancy--usually healthy men under 70—who have a biopsy showing any Gleason 4 or higher component, may be at risk for prostate-cancer related death; and therefore, be candidates for early treatment aimed at cure. The Gleason score is generated by the pathologist reviewing the processed biopsy cores under microscopic magnification and is comprised of two areas, each "graded" on a 1-5 scale, with "4" or "5" viewed as more aggressive in their cancer behavior. Since you can look at your Gleason score as two "dice" numbered 1 through 5, if one area has Gleason 4, the other rarely would have less than Gleason 3, so the threshold total (on a scale of 10) we are concerned about, usually "7" on a scale of "10", has been met.

The biopsy procedure, done under ultrasonic guidance, itself has evolved. Most are performed in the urologist's office, but some are done by radiologists and certain men require or benefit from the procedure being done in a surgery center or hospital under general anesthesia. In the office, I, but not all urologists, like to administer sedation to reduce anxiety and discomfort. I myself feel that the more relaxed patient is probably at less risk for post-biopsy pain and other complications like infection. Both topical numbing of the rectum and an initial transrectal prostate nerve block (both with xylocaine) before starting the biopsy help a lot. The numbers of tissue cores have been increased from what used to be a total of 6 (three per side) now to 10-12; but sometimes more if a large gland itself statistically requires more random sampling. Fewer cores may be needed if there is a discrete target, such as a lump by prostate exam or a nodule of altered echo-density noted during the ultrasonic scan. Prevention of significant infections seems very dependent on adequate rectal cleansing the day before with an enema [and less often with an oral-based bowel prep]. Fluoroquinolone antibiotics (Cipro or Levaquin) are often started the day before, but some practitioners just give a dose before the actual biopsy. I like "the day before and for a few days after" approach. Because of over-exposure of the population-at- large to drugs like Cipro, it is felt that fluoroquinolone-resistant bacteria residing in the rectum may be a reason for post-biopsy fevers/bacterial infections (perhaps 2-4% of all prostate biopsies); therefore, many--including myself--now like to add another antibiotic such as Ceftriaxone (Rocephin) intramuscularly before the procedure begins. The prostate biopsy, including the ultrasound, generally takes 15 minutes to complete.

Men ask me whether other tests especially stand-alone ultrasound or MRI can detect prostate cancer and perhaps eliminate the need for biopsy. A simple answer is "no"--but the results of these radiographic studies, as well as certain lab tests, can at least be suggestive of a prostate cancer, more so if they are abnormal. A more recently available lab test, PCA-3 (prostate cancer antigen-3), measures the amount of PCA-3 DNA (felt to be "overexpressed" by prostate cancer cells) versus PSA DNA, on a urine specimen taken after a somewhat vigorous prostate "massage". Studies suggest that over 90% of men with

prostate cancer have an abnormally high ratio of PCA-3 to PSA in the urine thus obtained. PCA-3 assays now are finding their place in men who have persistently high or rising PSA's DESPITE their already having had one or more negative biopsies. The results are helpful in advising whether yet another biopsy, perhaps with one of the techniques listed below, is worthwhile.

"Saturation" biopsy technique requires covering the entire gland with geographically closely placed biopsies, including some deeper cores of tissue into the so-called "transitional zone" (TZ) where cancers are less likely to occur than in the "peripheral zone" (PZ). Saturation technique may involve more than twice as many cores as a regular biopsy and may be better suited to a general anesthetic for comfort. Some studies suggest that at least 25% of men with previously negative (non-cancerous) biopsies may indeed have malignancy when more cores are taken.

MR (magnetic resonance) of the prostate with intravenous contrast is a great technology for detecting abnormalities not obvious by either digital rectal exam or ultrasound alone. MR Radiologists look for low magnetic signal intensity as well as "enhancement" by IV contrast material as features suggestive of prostate cancer. There is now computer software that can link (or "fuse") these abnormal MR findings to an actual ultrasound, so that the information incorporated allows precisely guided biopsies into areas that in reality look normal on ultrasound; but are "virtually" abnormal. Using this technology, biopsies are still done via transrectal ultrasound and not while the patient is inside the MRI machine. Not only has MR-US "fusion" detected more cancers, but getting back to my earlier point, it has much better yield that regular or saturation biopsies on [what appears to be a] normal gland for the more worrisome Gleason 7/10 or higher cancers, and a lower yield for prostate cancers that are felt to be low grade and thus less biologically a threat.

Working with Urology Specialists of Southern California (see my November, 2012 MEditorial), we are establishing a center here in OC to enable MR-US fused biopsies. The technology is expensive and for now, may have to be reserved for

those suspected of prostate cancer with previously normal biopsies--or as part of “active surveillance”. i.e., on those men whose choice of “observation” for their diagnosis of prostate cancer could be swayed by a more accurate type of follow-up biopsy indicating a prostate cancer more a threat to longevity.

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