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Radical prostatectomy findings in patients in whom active surveillance of prostate cancer fails

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Purpose: Little data are available on radical prostatectomy findings in men who experience disease progression following active surveillance.

Materials and Methods: A total of 470 men in our active surveillance program underwent annual repeat needle biopsies to look for progression defined as any Gleason pattern grade 4/5, more than 50% cancer on any core or cancer in more than 2 cores. Slides were available for review in 48 of 51 radical prostatectomies with progression.

Results: The average time between the first prostate biopsy and radical prostatectomy was 29.5 months (range 13 to 70), with 44% and 75% of the patients showing progression by the second and third biopsy, respectively. There were 31 (65%) organ confined cases, of which 25 (52%) were Gleason score 6. Of 48 cases 17 (35%) had extraprostatic extension, 3 had seminal vesicle/lymph node involvement and 7 (15%) had positive margins. Mean total tumor volume was 1.3 cm³ (range 0.02 to 10.8). Of the 48 tumors 13 (27%) were potentially clinically insignificant (organ confined, dominant nodule less than 0.5 cm³, no Gleason pattern 4/5) and 19% (5 of 26) of the radical prostatectomies with a dominant tumor nodule less than 0.5 cm³ demonstrated extraprostatic extension, 4 with Gleason pattern 4. All 10 tumors with a dominant nodule greater than 1 cm³ were located predominantly anteriorly.

Conclusions: Most progression after active surveillance occurs 1 to 2 years after diagnosis suggesting under-sampling of more aggressive tumor rather than progression of indolent tumor. Even with progression most tumors have favorable pathology (27% potentially insignificant). A small percentage of men have advanced stage disease (pT3b or N1). The anterior region should be sampled in men on active surveillance.

Editorial Comment

The criteria for insignificant prostate cancer in the present study were absence Gleason pattern grade 4 or 5, less than 50% cancer on any core or cancer in no more than 2 cores (1,2). It is better to consider these criteria as probabilistic predictors of small volume cancer with favorable pathologic findings. The term insignificant may be interpreted as the latent carcinoma of the prostate. Unfortunately, there is no marker so far to predict the biologic behavior of the prostate cancer. Even small volume cancers with favorable pathologic findings at the time of diagnosis may progress as clinically significant cancers.

The study showed that most progression after active surveillance occurred 1 to 2 years after diagnosis and even with progression most tumors had favorable pathology (27% potentially insignificant). The authors

suggest that occurred under sampling in the needle biopsy of more aggressive tumors by the time of diagnosis rather than progression of indolent tumor.

This is an important observation. The pathologist must be aware and inform if a sample is representative of the region biopsied. The criteria for insignificant prostate cancer (or small volume cancer with pathologic findings) should be applied only in well representative needle biopsies otherwise a rebiopsy should be performed.

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BASIC AND TRANSLATIONAL UROLOGY

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Uropathogen interaction with the surface of urological stents using different surface properties

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Purpose: Ureteral stents commonly become infected or encrusted. Various coatings have been developed to decrease bacterial adherence. To our knowledge there has been no in vitro testing of coating with heparin to date. We determined the effects of heparin coating on bacterial adherence of common uropathogens and physical stent properties.

Materials and Methods: Heparin coated Radiance ureteral stents (Cook) and noncoated Endo-Sof control stents were tested against triclosan eluting Triumph(R) stents and noneluting Polaris control stents for adherence of *Escherichia coli*, *Klebsiella pneumoniae*, *Enterococcus faecalis*, *Staphylococcus aureus* and *Pseudomonas aeruginosa* for 7 days. Adherent bacteria were determined and biofilms were visualized using fluorescent dyes. Radial, tensile and coil strength of the Radiance and Polaris stents was compared to determine the effect of heparin coating on physical stent characteristics.

Results: Heparin coating did not decrease bacterial adhesion compared to its control. *E. coli* adhesion was limited by all stents tested. The Polaris stent showed significantly greater resistance to bacterial adherence for *Klebsiella*, *Pseudomonas* and *Enterococcus* than the Endo-Sof and Radiance stents but was more susceptible to *S. aureus* adherence. The Triumph stent resisted all bacteria except *Pseudomonas* and *Enterococcus*. Mature biofilms were observed on all stents with lower viability on the Triumph stent. Radiance stents showed higher tensile and lower compression strength than its control.

Conclusions: Heparin coating does not decrease bacterial adherence to ureteral stents. Drug eluting antimicrobials have an inhibitory effect on bacterial adherence and the Polaris stent showed the least bacterial adherence of the nondrug eluting ureteral stents tested.