Because I have not been convinced that suprapubic tubes cause a significant number of orthopedic infections, I do not hesitate to use them when necessary. Those times when I must place an open suprapubic tube (perhaps for posterior urethral distraction injury when I am unable to place a catheter endoscopically) I do modify the way I perform the operation, attempting to keep the catheter as far away from the broken pelvis as possible. I tunnel the catheter out the dome of the bladder, through the peritoneal space, and bring it out of the skin at the most superior location possible - sometimes even supraumbilically.

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PATHOLOGY

Vascular invasion is an independent prognostic factor in prostatic adenocarcinoma

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Background: Prostate cancer is a significant cause of cancer morbidity and mortality in North American men. Tumor grade and stage are well-accepted prognostic factors. Histologic demonstration of tumor in vascular spaces has been associated with poor prognosis in many tumor types. Whether vascular invasion represents an independent prognostic factor for disease progression is uncertain in prostate cancer.

Design: 504 cases of prostatic adenocarcinoma from patients undergoing radical prostatectomy were reviewed for the presence of vascular invasion. Clinical followup data was available for 459 cases.

Results: Vascular invasion was identified in 106 (21%) of the cases. Univariate analysis showed a significant association between vascular invasion and PSA recurrence, tumor stage, Gleason grade, extraprostatic extension, seminal vesicle invasion, lymph node metastasis, surgical margins, perineural invasion, and preoperative serum PSA level (all $p \leq 0.001$). No association was observed between vascular invasion and age at surgery, prostate weight, or the presence of high grade prostatic intraepithelial neoplasia. Vascular invasion is an independent predictor of PSA recurrence after controlling for tumor stage and Gleason grade in the multivariate analysis.

Conclusions: Vascular invasion can be seen in approximately 20% of prostate cancers. Vascular invasion is an independent risk factor for PSA recurrence.

Editorial Comment

This paper emphasizes the importance of vascular invasion in radical prostatectomies. Most of the pathologists do not report this finding because it does not alter staging of the tumor. The same occurs in kidney and urinary bladder tumors except in testicular neoplasias. Since the 1997 edition of the TNM system for classification of malignant tumors, testicular neoplasms limited to the testis but with vascular invasion are classified as pT2 tumors.

The study from the Indiana University showed that vascular invasion seen in approximately 20% of prostate cancers is an independent predictor of PSA recurrence after controlling for tumor stage and Gleason

grade in the multivariate analysis. It was shown that vascular invasion is important and should be reported by pathologists. We hope that this finding is confirmed by other studies and considered in future staging systems.

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The combined percentage of Gleason 4 and 5 is the best predictor of cancer progression after radical prostatectomy

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Background: Clinical outcome is variable in prostate cancer patients treated by radical prostatectomy. The Gleason histologic grade of prostatic adenocarcinoma is one of the strongest predictors of biological aggressiveness of prostate cancer. We evaluate the significance of relative proportion of high grade cancer (Gleason pattern 4 and/or 5) in predicting cancer progression in prostate cancer patients treated by radical prostatectomy.

Design: Radical prostatectomy specimens from 364 consecutive prostate cancer patients were totally embedded and whole mounted. Various clinical and pathologic characteristics were analyzed. All the data were collected prospectively.

Results: The primary Gleason grade, secondary Gleason grade, Gleason score sum, the presence of Gleason grade 4, % of Gleason grade 4, the presence of Gleason grade 5, % of Gleason grade 5, and the combined % of Gleason grade 4 and 5 were all predictive of PSA recurrence (all P value <0.001). However, based on the Likelihood Ratio Test statistic the combined % of Gleason grade 4/5 is the best predictor of PSA recurrence. In a multivariate analysis that included the combined % of Gleason grade 4/5, Gleason score sum, tumor stage (T2 vs. T3), and surgical margins, only the combined % of Gleason grade 4/5 (P = 0.005) and surgical margins (P=0.01) were independent predictors of PSA recurrence.

Conclusions: The combined percentage of Gleason 4 and 5 is one of the most powerful predictors of patient outcome. We recommend that the combined percentage of Gleason 4 and 5 be evaluated in radical prostatectomy specimens.

Editorial Comment

As a measure of intrinsic biologic aggressiveness, Gleason grading may be enhanced by both structural (morphologic and morphometric) and functional means (by using gene expression profiling, for example). One proposed morphologic approach is quantitation of the amount of high-grade (percentage Gleason grade 4/5) carcinoma.

This paper clearly showed that the combined percentage of Gleason 4 and 5 is one of the most powerful predictors of patient outcome. We have recently evaluated in our Department 88 patients submitted to radical prostatectomy with a follow-up period of 12 to 63 (median = 26 months).Our data showed that comparing Gleason score (< 7 vs. = 7) and Gleason predominant grade (< 4 vs. 4/5) in the surgical specimen, only Gleason grade 4/5 was a statistically significant predictor of progression (recurrence and/or metastases) following radical prostatectomy.

Urologists should differentiate high-grade Gleason score 4 + 3 = 7 from 3 + 4 = 7. They have different biological significance. Pathologists should always report grade 4/5 in radical prostatectomy specimens even if it corresponds to a tertiary grade.

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INVESTIGATIVE UROLOGY

The distribution of neuronal and inducible nitric oxide synthase in urethral stricture formation

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Purpose: The distribution of neuronal (n) and inducible (i) nitric oxide synthase (NOS) may have a role in the maintenance of normal urethral spongiosum and during the development of spongiofibrosis in urethral stricture disease.

Materials and Methods: Eight normal and 33 strictured human bulbar urethras were studied by histological and immunohistochemical techniques for the neuronal markers S-100, nNOS and iNOS. The smooth muscle-to-collagen ratio was calculated by morphometric analysis of Masson's trichrome sections. Immunohistochemical staining patterns of the neuronal markers in normal urethral tissue was compared to that in urethral stricture tissue with spongiofibrosis.

Results: The smooth muscle-to-collagen ratio was significantly lower in the strictured urethra compared to that in the control group ($p = 0.001$). In the strictured bulbar urethra nNOS immunoreactivity was decreased compared to that in normal urethral tissue. The severity of spongiofibrosis corresponded to the loss of nNOS immunoreactivity. iNOS immunoreactivity was found in strictured urethral epithelium and spongiosal tissue, whereas the control group was nonimmunoreactive to iNOS.

Conclusions: Urethral stricture formation is a fibrotic process associated with significant changes in NOS metabolism. Abnormal collagen synthesis following urethral trauma may be stimulated by inappropriate iNOS activity. A functional nerve supply to the urethral spongiosum seems to be crucial in the maintenance of the unique ultrastructure of the urethral spongiosum.

Editorial Comment

It is well known that in the strictured urethra the main changes are found in the extracellular matrix. As well as in other tissues, the normal urethra and spongiosal tissue must have an adequate blood supply and nerve innervation to maintain its elastic and compliant characteristics. To our knowledge, this is the first study to analyze the quality of the nerve supply of the urethral spongiosum in the normal and strictured urethra. The authors investigated the changes of neuronal and inducible nitric oxide synthase (NOS) immunoreactivity in strictured bulbar urethras with different degrees of spongiofibrosis.

Structural differences in spongiosal tissue were described previously stating that biomechanical properties required for normal urethral function differ in the spongiosal tissue of glanular, penile and bulbar segments. For this study, the authors consistently used the bulbar urethra in the stricture and control groups.