

of blunt trauma, then detection of ureteric injury is improved (although I wonder how much this would increase the number of CT scans performed in the trauma population...); 4)- All penetrating injury patients need ureteric imaging if they have gross hematuria, microhematuria, or a flank wound; 5)- One shot IVP can be helpful in identifying ureteric injury, but intraoperative inspection of the ureter should still be done if the missile path is close to the ureter; 6)- The authors suggest that patients too unstable to tolerate ureteral repair should have the ureter tied off with silk suture and postoperative percutaneous nephrostomy placed. Definitive delayed repair can be completed later. Interestingly, none of the 38 injured ureters required this approach!; 7)- Most upper and mid ureteral injuries can be treated by minimal debridement and uretero-ureterostomy; 8)- Most distal ureteral injuries should be treated by ureteroneocystostomy; 9)- Some patients with delayed presentation may respond to ureteric stenting at the time of retrograde pyelogram. If not, then open repair will be required.

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PATHOLOGY

Correlation of minute (0.5 mm or less) focus of prostate adenocarcinoma on needle biopsy with radical prostatectomy specimen: role of prostate specific antigen density

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Purpose: Few studies have examined the radical prostatectomy followup of a minute focus of adenocarcinoma on prostate needle core biopsy.

Materials and methods: We searched the surgical pathology data base (1999 to 2000) for patients with a minute focus of Gleason score 6 adenocarcinoma (defined as a single focus less than or equal to a 40x microscopic field) who subsequently underwent radical retropubic prostatectomy at our institution. Potentially insignificant tumors were defined as those with a radical prostatectomy tumor volume of less than 0.5 cc, Gleason score 6 or less and organ confined disease.

Results: A total of 54 patients (mean age 58 years, range 45 to 70) were evaluated. The average number of prostate cores per biopsy was 6.3. All had Gleason score 6 by study design. Mean prostate specific antigen (PSA) was 6.0 (range 0.8 to 15). Average tumor volume at radical prostatectomy was 0.39 cc. Of the 54 tumors 24 (44%) were 0.1 cc or less. Two-thirds of the tumors were clinically potentially insignificant. Using a PSA density (PSAD) cutoff of 0.15 we identified 30 of 36 patients (83%) with potentially insignificant tumors. Of those with a PSAD of 0.15 or less with clinically significant tumors, 5 of 6 still had relatively small, organ confined tumors with Gleason score less than 7.

Conclusions: In the era of PSA screening most patients with a minute focus of Gleason score 6 or less adenocarcinoma on needle biopsy had potentially insignificant tumors. However, one-third of patients had clinically significant tumors warranting definitive therapy. The smallest focus of cancer on needle biopsy is not a guarantee of a clinically insignificant tumor. PSAD may have some value within this group in guiding clinicians and patients as to the likelihood of having clinically insignificant tumors.

Editorial Comment

Epstein is the correspondent author of this paper from The Johns Hopkins Hospital. The study evaluated PSA density and pathologic findings in needle biopsies predictive of “insignificant” tumors in radical prostatectomies. In our opinion the term “insignificant” should not be used because it may imply that the tumor should be ignored. This is not the case. It means a minimal cancer judged by a volume of less than 0.5 cc representing an incipient phase either of a clinical or a latent carcinoma. Unfortunately there is not yet a marker for this distinction. A predictive positive value of 83% for minimal cancer (< 0.5 cc) in radical prostatectomy was found using a PSA density (PSAD) cutoff of 0.15 or less and a minute focus of carcinoma in the needle biopsy on one core less or equal to a 40X microscopic field (about 0.5 mm) with no Gleason grade 4 or 5. This kind of study addresses a very important question regarding information to the patient. It is absolutely necessary that the patient be informed by the urologist in this circumstance that there is a probability of 83% for the cancer to be minimal (less than 0.5 cc) in the radical prostatectomy specimen. As a consequence of this fact and depending on how the specimen is processed there is a possibility around 5% to be very hard to find the cancer and even not to be found at all (DiGiuseppe JA et al.: Increasing incidence of minimal residual cancer in radical prostatectomy specimens, *Am J Surg Pathol.* 1997; 21: 174-8).

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Should each core with prostate cancer be assigned a separate Gleason score?

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Background: If multiple biopsy cores contain prostate cancer with differing Gleason scores, should an overall Gleason score be assigned, or should each core be graded separately?

Design: We obtained data on 127 men with prostate cancer on needle biopsy who underwent subsequent radical prostatectomy at our institution. We compared the Gleason scores found on needle biopsy with the grade and stage (organ-confined, extra-prostatic extension, positive seminal vesicles or lymph nodes) at radical prostatectomy.

Results: On biopsy, 40 men had a pure Gleason score of $4 + 3 = 7$, 25 men had a Gleason score of $4 + 3 = 7$ with a Gleason score of $3 + 3 = 6$ on a separate core of the biopsy specimen, 27 men had a pure Gleason score of $4 + 4 = 8$, and 35 men had a Gleason score of $4 + 4 = 8$ with separate cores containing Gleason pattern grade 3. A Gleason score of $4 + 4 = 8$ with pattern grade 3 in other cores had a more advanced stage than a pure Gleason score of $4 + 3 = 7$ ($P = 0.008$). There was no clear pattern analyzing pathological stage of men with a pure Gleason score of $4 + 3 = 7$ in comparison with those with Gleason scores of $4 + 3 = 7$ and $3 + 3 = 6$ in other cores. The group with a Gleason score of $4 + 4 = 8$ and Gleason pattern grade 3 on other cores had a higher overall grade on radical prostatectomy than the group with a pure Gleason score of $4 + 3 = 7$ ($P = 0.001$). If one had assigned an overall Gleason score, then a biopsy with Gleason score $4 + 4 = 8$ on 1 or more cores and some pattern grade 3 in other cores, would be designated as a Gleason score of $4 + 3 = 7$.

Conclusions: Based on our findings, patients with a Gleason score of $4 + 4 = 8$ on one or more cores with pattern grade 3 in other cores should be given a final Gleason score of $4 + 4 = 8$ instead of $4 + 3 = 7$, because these patients are more likely to have higher stage and grade on radical prostatectomy, comparable to

a pure Gleason score of $4 + 4 = 8$. Each core should be assigned a separate Gleason score, especially in cases with high Gleason score cancer on at least 1 core.

Editorial Comment

In our Institution each core with prostate cancer is assigned a separate Gleason score, e.g., slide #1: normal prostatic tissue; slide #2: focal atrophy; slide #3: adenocarcinoma Gleason $4 + 4 = 8$; slide #4: adenocarcinoma Gleason $3 + 3 = 6$; slide #5: focal atrophy; and, slide #6: normal prostatic tissue. This paper answers a frequent question by the urologist. Why assign each core separately instead of an overall Gleason score? In our example the overall Gleason score would be $4 + 3 = 7$. Kunz and Epstein answer this question. A Gleason score of $4 + 4 = 8$ with pattern grade 3 in other cores had a more advanced stage than a pure Gleason score of $4 + 3 = 7$ ($p=0.008$) and the group with a Gleason score of $4 + 4 = 8$ and Gleason pattern grade 3 on other cores had a higher overall grade on radical prostatectomy than the group with a pure Gleason score of $4 + 3 = 7$ ($p=0.001$). The authors conclude that each core should be assigned a separate Gleason score, especially in cases with high Gleason score cancer on at least one core. We fully agree with this conclusion and highly recommend urologists to ask from their pathologists to grade separately each core in case the pathology report is given as an overall Gleason score.

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INVESTIGATIVE UROLOGY

Reperfusion injury of the rat bladder is worse than ischemia

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Purpose: Previous studies have demonstrated that in vivo and in vitro ischemia of the bladder results in decreased contractile responses. However, to our knowledge the effect of reperfusion following ischemia of the bladder is not known.

Materials and Methods: Adult male rats were subjected to bilateral bladder ischemia and varying periods of reperfusion. In vivo ischemia was created for 4 hours by reversibly clamping the 2 vesical arteries for 4 hours. Reperfusion was produced by removing the clamps and allowing the animals to recover for 1 day, 1 week or 1 month after surgery. Following recovery bladders strips were studied using field stimulation (FS), carbachol and KCl. The maximal contractile response and rate of response generated were recorded digitally and analyzed.

Results: The maximal responses to FS, carbachol and adenosine triphosphate (ATP) were not decreased by 4-hour ischemia alone, whereas the response to KCl was decreased significantly. The contractile responses