IMAGING

Prospective comparison of computerized tomography and excretory urography in the initial evaluation of asymptomatic microhematuria

Gray Sears CL, Ward JF, Sears ST, Puckett MF, Kane CJ, Amling CL
Naval Medical Center San Diego, San Diego, California, USA, and Naval Hospital Okinawa, Okinawa, Japan

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Purpose: The ideal imaging study for evaluation of the upper urinary tract in patients with macrohematuria has been debated. We retrospectively compared the diagnostic yield of computerized tomography (CT) to excretory urography (IVP) in the initial evaluation of asymptomatic microhematuria.

Material and Methods: Between December 1998 and June 2001, 115 patients presenting with asymptomatic microhematuria underwent CT and IVP before cystoscopy. Helical CT images with 5 mm. adrenal and kidneys slices with and without contrast material were followed by delayed 5 mm. ureteral contrast images through the bladder base. Each CT and IVP was examined by a radiologist who was blinded to the result of the other imaging study. Diagnostic yields of the imaging techniques were compared using the test of 2 proportions and chi-square analysis.

Results: Radiographic abnormalities were noted on CT or IVP in 38 patients. Sensitivity was 100% for CT and 60.5 for IVP, and specificity 97.4% for CT and 90.9% for IVP. CT accuracy was 98.3% compared to IVP accuracy which was 80.9% ($p<0.001$). A total of 40 nonurological diagnoses were made by CT, including 3 abdominal aortic aneurysms and 1 iliac artery aneurysm. No additional diagnoses were made by IVP. Fewer additional radiographic studies were recommended after CT than after IVP.

Conclusions: The use of CT in the initial evaluation of asymptomatic microhematuria results in better diagnostic yield. In addition, more nonurological diagnoses can be made and less additional radiography is needed to confirm a diagnosis.

Editorial Comment

Radiological imaging plays an important role in the initial evaluation of patients with painless micro- or macrohematuria. Helical CT is the method of choice for evaluation of the kidneys and urinary collecting system, including renal masses, infection, trauma, and urinary calculi. This method, however, has limitations

for demonstrating the urothelium, and thus IVP still remains the initial imaging procedure for evaluating hematuria in many centers. Recently, a new technique called CT-urography has been developed, and successfully used for evaluating the urothelium. CT-urography can be performed with a single detector CT, or preferably with a multi-detector row CT (multi-slice CT). With multi-slice CT, multiple channels of data are acquired simultaneously, allowing thinly collimated images to be obtained through the entire urinary tract in a single breath hold. For better demonstration of the entire ureters, usually a supplemental infusion of normal saline can be used in order to obtain maximum distension, and consequently optimal visualization of the normal anatomy of the renal pelviocalyceal system, ureters, and entire bladder .This technique also provides high resolution multiplanar and 3D image reconstructions, which are similar to the conventional IVP films. This article is significant because it shows that an excellent degree of accuracy (98.3%) compared to IVP (80.9%), can be obtained with single slice helical CT. Obviously the single detector CT-urography must be used under strict diagnostic criteria. Obviously multi-detector row CT offers better image resolution than single slice helical CT. In our opinion , there is no doubt that in the near future CT-urography will completely replace the IVP for the evaluation of patient with hematuria. Besides urological abnormalities, CT-urography can detect several causes of non-urological diseases causing hematuria. IVP is an insufficient imaging method for a complete evaluation of a patient with hematuria, and isolated — or even associated —complementary radiographic studies are usually recommended.

Reference

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Dr. Adilson Prando
Department of Radiology
Vera Cruz Hospital
Campinas, São Paulo, Brazil

Prostate biopsy: indications and technique

Matlaga BR, Eskew LA, McCullough DL
From the Department of Urology, Wake Forest University School of Medicine, Winston-Salem, North Carolina, USA

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Purpose: The last decade has seen numerous modifications in the way prostate cancer is diagnosed. We review the current indications for and methods of prostate biopsy.

Materials and Methods: The English language literature was reviewed regarding major indications for and methods of prostate biopsy. Pertinent peer reviewed articles were collated and analyzed.

Results: The most widely accepted indication for prostate biopsy is a prostate specific antigen (PSA) value of greater than 4.0 ng./ml. However, some investigators advocate prostate biopsy for men with a PSA value in the 2.5 to 4.0 ng./ml. range, believing that use of this parameter results in detection of a greater number of cases of curable disease. Age specific PSA range, percent free PSA and presence of prostatic intraepithelial neoplasia or atypia are all considered to be relative indications for prostate biopsy. The current literature describes a trend toward increasing the number of cores obtained and the sites biopsied beyond those of the standard sextant technique. The additional cores in many series are obtained from more lateral regions of the gland.

Conclusions: Although several criteria are used as indications for initial prostate biopsy, all are based on PSA level and/or abnormal digital rectal examination. Future improvements in currently used prostate cancer markers may result in better selection of cases to biopsy. There is no universally accepted technique of prostate gland biopsy. The current literature supports use of more extensive biopsy techniques to increase the likelihood of prostate cancer detection.

Editorial Comment

In the recent years, much has been written about how to optimize the indications and the techniques of transrectal ultrasound-guided biopsy for the detection of prostate cancer. This important compilatory study, nicely answered the most common questions about prostate biopsy, such as the following questions listed below: 1)- Decrease or not the PSA cutoffs to enhance prostate detection? To biopsy a patient with PSA of 2.5 to 4.0 ng/mL, would be advisable only in patients with family history, increased age-adjusted PSA, or abnormal digital rectal examination. 2)- Is intrarectal lidocaine jelly a good choice for local anesthesia? No, local anesthesia (periprostatic nerve block with 1% lidocaine) is far superior than that achieved with intrarectal lidocaine jelly. 3)- How many cores do we have to take during the biopsy? Although there is no consensus about the name of the approach of taking a larger number of cores from the far lateral portions of peripheral zone, it is clear that at least 12-13 cores are necessary. Interesting enough is that this number of cores has the same accuracy as the recent and invasive method called "saturation technique". This saturation technique has the drawback of requiring a general anesthesia. 4)- Can we use endorectal magnetic resonance (MR) to improve the prostate biopsy accuracy? Yes, The overall accuracy of endorectal MR imaging to improve prostate cancer detection rate was 70%. So the finding of an abnormal area of hypo-intensity in T2-weighted images for a patient with previous negative biopsy is very suspicious and should be biopsied accordingly. 5)- Do we need to biopsy the transition zones routinely? No, there is not enough data to support this approach. The transition zones should be biopsied only in patients with previous negative biopsy, and in those with negative DRE and elevated PSA levels (>15 ng/mL).

Unfortunately the authors did not mention the utility of color-Doppler ultrasound, particularly "power Doppler with echo-contrast", which has been shown to be a useful method detecting 8-16 % of isoechoic neoplasms (1,2). This is particularly useful in patients with large prostates. The use of the 5 regions technique (13 cores) in patients with different gland sizes showed that the cancer detection rate was 43%, 27%, and 24% of men with prostate volumes <30 cc, 30 to 50 cc and >50 cc, respectively (3).Color Doppler ultrasound would certainly increase the cancer detection rate in this group of patients.

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Dr. Adilson Prando
Department of Radiology
Vera Cruz Hospital
Campinas, São Paulo, Brazil