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of the phallus. If the same hospitalized patient would rather die or lose the penis than to reveal his homosexuality, it is ludicrous to suggest that this information could have been obtained before an elective circumcision in the office. How was an HIV test obtained when law requires written and informed consent from this patient who denied high risk behavior?

Respectfully,
John T. Hotter
1085 Fairhaven Boulevard
Bloom Grove, Wisconsin 53122

RE: HISTOPATHOLOGICAL AND CYTOPATHOLOGICAL CORRELATIONS OF PERCUTANEOUS TESTIS BIOPSY AND OPEN TESTIS BIOPSY IN INFERTILE MEN

D. N. Kessaris, P. Wasserman and B. C. Mellinger

To the Editor: While there is no question that testicular biopsy can be reduced to a percutaneous method that will provide excellent histopathological and cytopathological information, it is also true that by obtaining the biopsy percutaneously the opportunity to examine the epididymis with magnification (loupes) is lost. Performance of a testicular biopsy with a spermatic cord block using intravenous sedation with diazepam through a small transverse scrotal incision in the office affords the opportunity to evaluate the epididymis visually in addition to obtaining biopsy material. The appearance of the epididymis provides extremely valuable information to help define obstruction involving the vasa efferentia. This is 1 instance when I argue against oversimplifying a technique.

Respectfully,
James H. Nelson, III
Buckeye Urology & Andrology, Inc.
Physician's Tower, Suite 1601
Park Medical
1492 East Broad Street
Columbus, Ohio 43205-1546

Reply by Authors. The visual appearance of the epididymis may often suggest obstruction. However, visual inspection is certainly not conclusive. An obstruction can only be determined adequately at surgical exploration. An obstruction is present when the testis has been determined to produce mature sperm and when no sperm can be identified in the vasal fluid distal to the site of obstruction. A small incision into the hemiscrotum, which would permit adequate visual inspection, may also subsequently lead to significant adhesions that may make reconstructive microsurgery somewhat more difficult. Most infertility specialists also advocate using the “window” technique when performing open testicular biopsy, since this may lessen the incidence of postoperative adhesions. The purpose of testicular biopsy is only to determine whether there is relatively normal spermatogenesis. Ductal obstruction is conclusively demonstrated at subsequent surgical exploration.

Reply by Authors. The authors on their perseverent work to develop an automated program measuring total prostate volume from ultrasonic images. The accuracy of this computerized planimetric method was excellent compared to off-line hand-drawn planimetric volumetry using the identical ultrasonic images as the computer. The planimetric volume described as the transverse plane (reference 3 in Letter) was less accurate due to the clinical on-line situation of the ultrasonographer.

The authors chose planimetry as a standard because of its accuracy in the literature. Step-section planimetry, however, appears to be the most reproducible of the various volumetric methods, especially when used transrectally instead of the suprapubic method described by Fegr and Knönagel. We really wonder about the reproducibility of the various volumetric methods applied by the authors, since their data show that the ultrasonographer in their study interpreted the volume of a prostate on an identical set of ultrasonic images to be approximately 40% smaller and with a large variation compared to the off-line situation in which the reference volumes were created. In addition, we are interested to learn whether the automated volume is reproducible when an identical prostate is measured from a second or third set of ultrasonic images because these ultrasonic slices will hardly ever be identical to the first set. In step-section planimetry it has been illustrated that various volumetric errors may be induced due to small changes in position of the ultrasonic probe in relation to the prostate. Moreover, the interobserver variation between urologists, possibly depending on their expertise, using the automated system compared to off-line planimetry in a standard clinical situation needs further evaluation.

Hopefully the authors will continue to create a similar program measuring the volume of the adenomatous tissue. Although the total prostate volume has been used to illustrate response to therapy, an even more important feature of prostate volumetry is the volume adjustment of serum prostate specific antigen (PSA) values. Various articles have shown that the transition zone is far more important than the peripheral zone with regard to the increase of specificity to detect prostate carcinoma by PSA adjusted for the transition zone compared to PSA density.

Respectfully,
Chris H. Bangma and Fritz H. Schröder
Department of Urology
Academic Hospital Rotterdam
Molewaterplein 40
3015 GD, Rotterdam
The Netherlands


Reply by Authors. Bangma and Schröder are concerned about the reproducibility of various volumetric methods in sets of images of identical prostates, especially the reproducibility of the methods used for planimetric volumetry, since step-section volumetry appears to be the most reproducible method. The differences described in our article occur because different methods were used to obtain the volumes. The clinical and transverse volumes were obtained at the clinic using the built-in volumetry method of the Kretz Combius ultrasound scanner. The differences reported between the longitudinal and transverse volumes indicate the limitations of this method. The area for capturing ultrasound images is limited to 150 cc. Contour following with the track ball can easily lead to displaced contours. At our clinic routine outlining has been performed in the longitudinal plane to overcome the “salami” effect that may occur in the transverse plane (reference 3 in Letter). Interpretation differences may be introduced using different planes. The clinical intersection distance (or step size) was not fixed but selected manually and errors may occur in clinical outlining due to time pressure. These reasons will lead to a large variability for the built-in volumetry of the echo scanner. The results were compared to the off-line outlining.
Another point of discussion is the reproducibility of the automated method when an identical prostate is measured using another set of images. The quality of planimetric volumetry can be expressed by the accuracy and reproducibility. We are aware of the limitations of numerical integration influencing the accuracy and reproducibility. Possible influences are first step effect, step size and "salami" effect. Testing the reproducibility of the automated method is also a test for the reproducibility of prostatic ultrasound. From a computer analysis, we concluded that in theory the accuracy error for 4 mm. step size is 2.3 to 1.8%, depending on the selection of the first section and the length of the prostate. Also, rotational movements leading to a tilted prostate axis compared to the probe axis can be an influence. From this analysis, we can conclude that several sets of images from 1 patient will have a theoretical accuracy of more than 97%. The objective of our study, however, was to compare the computer outlining in prostatic images to the manual outlining by an experienced urologist. For the computer it makes no difference whether new set of images is taken from a new or former patient. The computer has no memory nor has it learned from other images. Since the reference volume is obtained from the corresponding set of images. The quality of planimetric volumetry can be expressed by the accuracy and reproducibility. We are aware of the limitations of numerical integration influencing the accuracy and reproducibility. Possible influences are first step effect, step size and "salami" effect. Testing the reproducibility of the automated method is also a test for the reproducibility of prostatic ultrasound. From a computer analysis, we concluded that in theory the accuracy error for 4 mm. step size is 2.3 to 1.8%, depending on the selection of the first section and the length of the prostate. Also, rotational movements leading to a tilted prostate axis compared to the probe axis can be an influence. From this analysis, we can conclude that several sets of images from 1 patient will have a theoretical accuracy of more than 97%. The objective of our study, however, was to compare the computer outlining in prostatic images to the manual outlining by an experienced urologist. For the computer it makes no difference whether new set of images is taken from a new or former patient. The computer has no memory nor has it learned from other images. Since the reference volume is obtained from the corresponding set of images, new data points are obtained. We can assume that the accuracy of these points will be in the same range as the accuracy presented in the article for 55 patients.

A question raised by Bangma and Schröder concerns the inter-observer variation when different urologists use the automated method. The expertise of the examining urologist can be of influence in the results of the automated method but this influence is limited to the first and last step-sections, and to the quality of the images used as input to the automated method. Leaving out images at the beginning or the end of the prostate will, of course, lead to an underestimation of the prostate volume. Also, the image quality is important for the correct assessment of the prostate boundary location, which means that the protocol definition is important: store the first image at the base in which the prostate is visible, and retract the probe until the apex is reached and the prostate volume measured after prostatectomy when the investigator is making an effort to outline exactly.2

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As also in our article, we agree with Bangma and Schröder that the volume of the transition zone is important for the interpretation of PSA levels. Since the prostate has a nonhomogeneous structure within the gland, no local information can be used to detect this zone with the edge detection tools described in the article in contrast to the outside border of the prostate. Other image processing tools, such as texture, describing parameters for classification of prostatic tissue,4 may be capable of detecting the transition zone automatically. However, the possibilities of these techniques for a clinical application need further evaluation.