

### Editorial Comment

Similar to other studies the authors showed that MR imaging findings might represent additional useful variables for predicting disease extent in patients with clinically localized prostate cancer. Combined endorectal MRI-MR spectroscopic imaging had 80% accuracy in the staging of disease in patients with clinical stage T1c prostate cancer. These combined techniques had a moderate accuracy, 62-72%, in the prediction of clinically non-important cancer in this group of patients. As the authors pointed out it would be of clinical interest in the future to investigate whether multiparametric examination which combination of conventional T2-w images, spectroscopy, diffusion-weighted image (DWI) and perfusion studies can yield superior diagnostic information for stratifying patients with T1 c prostate cancer. Since 2004, we have been using in our department this multiparametric evaluation in patients with organ-confined tumor, based on finding of conventional T2-weighted images.

We have found that DWI and perfusion techniques, similarly to spectroscopy are very useful to detect tumor > 0.5 cm<sup>3</sup> and with higher Gleason grades. All techniques have difficult to detect smaller and low grades tumor. In other words, when we find a lesion with imaging characteristics of a possible aggressive tumor on T2-w images and spectroscopy, but without concordant findings on DWI and perfusion studies, our tendency is to downgrade the lesion to a possible less important one. We have found that usually a large and aggressive tumor will present as an area with restricted diffusion (lower ADC values) and with abnormally elevated values of the pharmacokinetics parameters obtained with perfusion studies. On the other hand, patients with normal multiparametric prostate examination has a very high probability of have a clinically non-important cancer.

Another important finding of this study is that from 158, 124 (78%) patients had organ-confined disease (stage pT2), 29 (18%) had extracapsular extension (stage pT3a), two (1%) had seminal vesicle invasion (stage pT3b), and two (1%) had bladder neck invasion (stage pT4). We have to remember that clinically T1 c patients typically are considered to have localized early-stage disease of relatively low risk. Additionally 30 (19%) of the patients met the criteria to be considered for active surveillance as a management strategy, 4(13%) had extraprostatic extension of disease at surgical-pathologic analysis. These findings further enhance the value of endorectal MRI examination in the pre-operative evaluation of patients with T1c prostate carcinoma.

**Dr. Adilson Prando**

*Head, Department of Radiology and  
Diagnostic Imaging, Vera Cruz Hospital  
Campinas, São Paulo, Brazil  
E-mail: adilson.prando@gmail.com*

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### Bladder tumor staging: comparison of contrast-enhanced and gray-scale ultrasound

Caruso G, Salvaggio G, Campisi A, Melloni D, Midiri M, Bertolotto M, Lagalla R

*Dipartimento di Biotecnologie mediche e Medicina legale, Sezione di scienze radiologiche, Università degli Studi di Palermo, Palermo, Italy*

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**Objective:** The purpose of this study was to evaluate the effectiveness of contrast-enhanced sonography in comparison with conventional sonography in differentiating muscle-infiltrating and superficial neoplasms of the urinary bladder.

**Subjects and Methods:** Conventional and contrast-enhanced sonography were performed on 34 consecutively registered patients with bladder tumors. All examinations were reviewed by two independent sonologists. At gray-scale sonography, interruption of the hyperechoic bladder wall was considered the main diagnostic criterion for differentiating superficial and infiltrating tumors. At contrast-enhanced sonography, a tumor was considered superficial when the hypoenhancing muscle layer of the bladder wall was intact; disruption of the muscle layer by enhancing tumor tissue was considered diagnostic of infiltration. A level of confidence in the diagnosis of tumor infiltration of the muscle layer was assigned on a 5-degree scale. Receiver operating characteristic analysis was used to assess overall confidence in the diagnosis of muscle infiltration by tumor at both conventional and contrast-enhanced sonography. Histologic diagnosis was obtained for all patients.

**Results:** Final pathologic staging revealed 25 superficial tumors (Ta-T1 disease) and nine muscle-infiltrating tumors (>T1). Conventional sonography depicted five of nine muscle-infiltrating tumors, and contrast-enhanced sonography depicted all nine. The diagnostic performance of contrast-enhanced sonography approached that of the reference standard (area under the receiver operating characteristic curve, 0.996), but the diagnostic performance of gray-scale ultrasound was worse (area under curve, 0.613).

**Conclusion:** Our study showed that contrast-enhanced sonography is better than conventional sonography for differentiating muscle-infiltrating and superficial neoplasms of the urinary bladder.

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According to the American College of Radiology Appropriateness Criteria, the use of transabdominal ultrasound for pretreatment staging of invasive bladder cancer receives rating 3 (rating scale 1 = least appropriate and 9 = most appropriate). This poor rating is due to the inherent limitation of the abdominal transducers in the visualization of the layers of the bladder wall, which usually appeared homogeneously hyperechoic. Based on their previous observation that after microbubble administration the layers of the bladder wall were clearly differentiated with conventional ultrasound the authors decided to investigate the effectiveness of contrast-enhanced sonography compared with conventional gray-scale sonography in differentiating muscle-infiltrating and superficial neoplasms of the urinary bladder. The diagnostic performance of contrast-enhanced sonography was much better than the gray scale ultrasound (AUC 0.996 x AUC 0.613). As already mentioned by the authors contrast-enhanced sonography has many of the limitations of other ultrasound techniques (difficulty to detect flat lesions; obesity and calcification impairs bladder wall evaluation; columnar hypertrophy of the bladder wall, calcification and tumor location may be troublesome during examination). However, one of the most important limitations of this technique is that the FDA did not approve yet its use for internal medicine examination. Another important limitation is related to the necessity of specialized contrast-specific ultrasound techniques found only in state-of-the art equipments. With contrast-enhanced ultrasound is also very difficult to obtain information on the extent of extra-vesical spread of large, widely infiltrating tumors and on the status of pelvic lymph node. For this reason, we still prefer to use magnetic resonance imaging as the main imaging modality for local staging of possible invasive bladder cancer (T staging accuracies 73% to 96% of cases and 73% to 98 % accuracy for staging of nodes and metastases).

**Dr. Adilson Prado**

*Head, Department of Radiology and  
Diagnostic Imaging, Vera Cruz Hospital  
Campinas, São Paulo, Brazil  
E-mail: adilson.prado@gmail.com*