

### Editorial Comment

As nice as it would be to conclude that this study provides definitive evidence with regards to one energy source over another, as the authors would like us to believe as suggested by their stress on the energy source rather than the particular lithotripter throughout the text, it does not do that. Other differences between the lithotriptors make this conclusion invalid. The focal zone is 224 mm<sup>2</sup> in the MFL and 175 mm<sup>2</sup> in the DLS. The number of shock wave delivered was not provided. One might conclude reasonably, however, that indeed the DLS is a better machine than the MFL – primarily owing to the lower retreatment rate. Since the MFL is no longer in production, this information is not all that useful. One finding in the study that is very useful, however, is the minimal (0.6 %) rate of hematoma formation overall, despite the use of sensitive CT scans for surveillance. Other studies have suggested that hematoma formation might be more frequent with either machine, and given the sensitive radiographic assessment in this study I find this reassuring.

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## IMAGING

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### **Multidetector CT angiography for preoperative evaluation of living laparoscopic kidney donors**

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**Purpose:** The purpose of this study was to determine the accuracy of multidetector CT (MDCT) angiography as the primary imaging technique in the evaluation of living kidney donors.

**Material and Methods:** Seventy-four consecutive living kidney donors (30 men, 44 women; mean age, 41.7 years) who underwent MDCT were evaluated. CT examination was performed with 120 mL of IV contrast material at an injection rate of 3 mL/sec and a pitch of 6. In every case, arterial and venous phase volumetric data sets were acquired at 25 and 55 sec, respectively. Scans were reconstructed at 1-mm intervals for three-dimensional (3D) imaging using a volume-rendering technique. Axial CT images and 3D CT angiography were evaluated prospectively by one reviewer and retrospectively by two reviewers who had no knowledge of surgical results. Surgical correlation for the location of primary and accessory renal arteries, early branching of the renal arteries, and renal vein anomalies was made.

**Results:** Seventy-two subjects underwent left nephrectomy, and two subjects underwent right nephrectomy because supernumerary left renal arteries were detected on preoperative CT angiography. Eighteen supernumerary renal arteries (two arteries to 16 kidneys and three arteries to one kidney) to 74 kidneys underwent nephrectomy. CT and surgical findings agreed in 93% of subjects (the average of three reviewers; range, 89–97%). Two small accessory renal arteries were missed by all three reviewers. Those arteries were diminutive and were thought to be insignificant by the surgeons. Early branching of the renal arteries was shown in 14 arteries, and CT and surgical findings agreed in 96% (the average of three reviewers; range, 93–97%). Renal vein anomalies were present in eight subjects, and CT and surgical findings agreed in 99% of the cases (range, 96–100%).

Conclusions: MDCT angiography is highly accurate for detecting vascular anomalies and providing anatomic information for laparoscopic living donor nephrectomy.

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Radiological imaging plays an important role in the evaluation of potential living related kidney donors since anatomical and functional assessment of the donor kidney is mandatory. This is particularly critical when laparoscopic donor nephrectomy is performed. As we know, arterial and venous anomalies are more frequently found in the left kidney. Since this kidney is usually preferred for laparoscopic nephrectomy, the demonstration of arterial or venous anomalies is essential for the success of the surgical procedure. Single-slice helical CT angiography with advanced 3-D techniques provides detailed description of the vascular, parenchymal, and collecting system and is considerably a method with high accuracy for detecting vascular anomalies and provides anatomical information. It may be used as the primary tool for donor evaluation since additional useful information can be obtained: cortical cysts, duplex collecting system, hydronephrosis and renal stone. Recently several reports have shown high accuracy of single-slice CT angiography in demonstrating accessory arteries (78–98%), early arterial branching (89–99%), and renal / perirenal venous anatomy (90–99%) as pointed out in this manuscript. These rates are not significantly different from those obtained with MDCT, 89–97%, 93–97% and 96–100%, respectively. The use of the recent technology of multi-slice CT known also as multi-detector CT, has several advantages over single-slice technology (better vascular opacification and higher spatial resolution) and few but important drawbacks (higher dose of ionizing radiation and potentially nephrotoxic contrast agents). In order to avoid such problems one might consider using MR angiography, which is also very important method for the preoperative evaluation of living kidney donors. Preoperative CT and MR angiography of the renal arteries in renal donors demonstrate substantial agreement and similar high rates of accuracy. MR angiography has the advantage of avoiding ionizing radiation and potentially nephrotoxic contrast agents.

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### **Contrast enhances color Doppler endorectal sonography of prostate: efficiency for detecting peripheral zone tumors and role for biopsy procedure**

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Purpose: We evaluated the accuracy of contrast enhanced color Doppler endorectal ultrasound to guide biopsy for the detection of prostate cancer.

Materials and Methods: A total of 85 patients were evaluated with gray scale and color Doppler before and during intravenous injection of ultrasound contrast agent made of galactose based air micro bubbles. Our biopsy protocol was performed during contrast injection. An additional 18 directed cores were obtained based on contrast-enhanced imaging. Diagnostic efficiency with and without contrast medium injection for detecting prostate cancer was compared based on biopsy results.

Results: Cancer was identified in a total of 58 biopsy sites in 54 patients. Gray scale imaging revealed 96 abnormal hypoechoic nodules or irregular zones inside the outer gland, of which 48 were malignant on

pathological evaluation. Contrast enhanced color Doppler had higher sensitivity (93%) than unenhanced color Doppler (54%), while specificity increased only 79% to 87% for enhanced imaging. Nine of 10 isoechoic suspicious zones were depicted with enhancement, while unenhanced Doppler detected 7 of them. There was no significant difference between the intensity of enhancement and tumor Gleason scores.

**Conclusions:** Contrast enhanced color Doppler endorectal sonography increases the detection of prostate cancer. Improvement in sensitivity was high, while the difference in specificity was not as pertinent. It is accurate when using a common and routine application ultrasound unit. This technique is easy to perform and not time-consuming. Obtaining additional biopsy cores of suspicious enhancing foci significantly improves the detection rate of cancer.

### Editorial Comment

Color Doppler ultrasound (CDUS) has already been proved to be of a great value as a complementary method for the detection of prostate cancer during transrectal guided biopsy. Although it has proven utility, unfortunately, this method is not used routinely in many centers. Some of the reasons may be explained by the fact that CDUS of the prostate requires high resolution modern equipments (with power Doppler), dedicated and experienced sonographer and appropriate control settings. The use of energy Doppler (Doppler angiography, power Doppler) is better than velocity Doppler in order to demonstrate subtle area of abnormal flow (areas with increased neovascularity). This occurs because energy Doppler is not dependent of the angle of the ultrasound beam. The use of microbubbles as an echo-contrast improves the ability of CDUS to better demonstrate the neovascularity associated with cancer. We have found that this phenomenon is particularly useful in large prostate gland (> 60 grams), prostate gland with isoechoic peripheral zone and prostate gland showing 2, 3 or more suspicious areas. Obviously 2 or 3 cores of the area with abnormal flow must be taken additionally to the cores obtained by the systematic biopsy. In our department routinely used CDUS without and with echo-contrast demonstrated respectively, 8% and 15% of cancer not seen on gray-scale US examination (isoechoic cancer) (1). The authors present a high sensitivity and specificity of the contrast enhanced CDUS (93 and 87% respectively). Other studies has been shown that Doppler angio-sonography (power Doppler) with eco-contrast increased the detection of prostate cancer from 38 % to 85% with an 80% specificity (2). There is no doubt that power Doppler ultrasound, preferably with eco-contrast should be used routinely during transrectal biopsy of the prostate. This technique is particularly helpful in normal appearance prostate gland (mainly those larger than 60 grams), prostate with more than one suspicious area and in patients with negative biopsies and rising PSA.

### References

1. Prando A: The value of color in detection of prostate cancer. *Radiol Brasil*. 1998; 30: 233-7. [in Portuguese]
2. Bogers HA, Sedelaar JP, Beelarge HP et al.: Contrast-enhanced 3-D power Doppler of the prostate: correlation with biopsy outcome. *Urology* 1999; 54: 97-104.

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