

since it did not provide magnification. The authors concluded that the homemade laparoscopic trainer offers easy setup and use with comparable quality to the fancier pelvic trainers allowing the user to record and play back sessions for personal review or to have a distant proctor assisting via the Internet.

Unquestionably, better educational and training tools need to be developed to decrease the learning curve and minimize complications in laparoscopic surgery. Certainly virtual simulation models as well as training programs and centers are in need not only to grant the initial training but also to provide assistance in the clinical setting.

Dr. Fernando J. Kim
Assistant Professor of Urology
University of Colorado Health Sciences Center
Denver, Colorado, USA

IMAGING

Significance of the pseudocapsule on MRI of renal neoplasms and its potential application for local staging: a retrospective study

Roy C Sr, El Ghali S, Buy X, Lindner V, Lang H, Saussine C, Jacqmin D
University Hospital of Strasbourg, Radiology B Chirurgie A, Hopital Civil CHU, Strasbourg, France
AJR Am J Roentgenol. 2005; 184: 113-20

Objective: The purpose of our study was to evaluate the role of MRI in showing a pseudocapsule for local staging of renal tumors, and its potential application to select patients for partial surgery.

Materials and Methods: Eighty tumors (73 renal cell carcinomas [RCCs] and seven oncocytomas) were preoperatively evaluated by MRI. MRI findings were assessed with a special focus on perinephric fat and pseudocapsule. Correlations were performed with pathologic staging after surgery.

Results: At pathology, a pseudocapsule was recognized in 79 cases. Twenty-three RCC were staged pT3a (21 clear cell; two papillary). MR images exhibited a pseudocapsule in 90% of cases as a hypointense rim surrounding the tumor on T2-weighted images. MRI findings concerning isolated analysis of the pseudocapsule for differentiating stage T1/T2 from T3a were sensitivity: 86%, 50%; specificity: 95%, 92%; positive predictive value: 95%, 33%; negative predictive value: 88%, 92%; and accuracy: 93%, 89%, for clear cell and papillary types, respectively. For stage T3a, with both abnormalities of the pseudocapsule and perirenal fat, results were, for overall RCC sensitivity: 84%; specificity: 95%; positive predictive value: 91%; negative predictive value: 91%; and accuracy: 91%.

Conclusion: The identification of the pseudocapsule offers an additional value for local staging by MRI. The presence of an intact pseudocapsule is a sign of lack of perinephric fat invasion. It is more likely to predict that the tumor can be removed by partial surgery.

Editorial Comment

The identification of a well defined pseudocapsule around a small tumor has recently been considered a very important finding for the local staging of a possible renal cell carcinoma. As we know this pseudocapsule represents a narrow area of fibrosis and normal renal parenchyma, which is displaced by the slow growing tumor. The demonstration of a well defined pseudocapsule by helical CT indicates that in the majority of

cases the renal tumor is confined to the kidney (stage T1), thus amenable to conservative surgery: open partial nephrectomy or laparoscopic partial nephrectomy (1). The identification of this pseudocapsule by CT has 95% accuracy for predicting that the tumor is confined to the kidney. The authors used in this study MR imaging findings for identification of the pseudocapsule and their results confirm the conclusion of the study using multidetector CT. The authors shows that the presence of pseudocapsule (thin, regular, linear band with hypo-intensity signal in both T1 and T2 –weighted images), is a reliable imaging sign to predict lack of perinephric fat invasion. Consequently, this sign is useful for differentiating stage T1/T2 from stage T3a, with a 92% positive predictive value .When there is disruption of this pseudocapsule and consequent opacification of the perirenal fat manifested as spiculation around the mass, the overall accuracy for predicting stage T3a is 91% .This finding is very useful for adequate surgical management of renal tumors since in many centers stage T3a tumor is considered a limitation for conservative renal surgery.

Reference

1. Catalano C, Fraioli F, Laghi A, Napoli A, Pediconi F, Danti M, Nardis P, Passariello R: High-resolution multidetector CT in the preoperative evaluation of patients with renal cell carcinoma. *AJR* 2003; 180: 1271-7

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

CT urography of urinary diversions with enhanced CT digital radiography: preliminary experience

Sudakoff GS, Guralnick M, Langenstroer P, Foley WD, Cihlar KL, Shakespear JS, See WA
Department of Radiology, Medical College of Wisconsin, Froedtert Hospital, Milwaukee, WI, USA
AJR Am J Roentgenol. 2005; 184: 131-8

Objective: The purpose of this study was to determine if 3D-rendered CT urography (CTU) depicts both normal and abnormal findings in patients with urinary diversions and if the addition of contrast-enhanced CT digital radiography (CTDR) improves opacification of the urinary collecting system.

Materials and Methods: Thirty CTU and contrast-enhanced CTDR examinations were performed in 24 patients who underwent cystectomy for bladder cancer. Indications for evaluation included hematuria, tumor surveillance, or suspected diversion malfunction. All examinations were evaluated without knowledge of the stage or grade of a patient's tumor and were compared with the clinical records. Opacification of the urinary collecting system was evaluated with 3D CTU alone, contrast-enhanced CTDR alone, and combined CTU and CTDR.

Results: Nine abnormalities were identified including distal ureteral strictures (n = 4), vascular compression of the mid left ureter (n = 1), scarring of the mid right pole infundibulum (n = 1), bilateral hydronephrosis and hydroureter (n = 1), urinary reservoir calculus (n = 1), and tumor recurrence invading the afferent limb of the neobladder (n = 1). Eight of the nine detected abnormalities were surgically or pathologically confirmed. All abnormalities were identified on all three imaging techniques but were best seen on 3D CTU and enhanced CTDR images. Incomplete opacification of the urinary collecting system occurred in 17 patients with CTU alone, 12 patients with contrast-enhanced CTDR alone, and nine patients with combined CTU and contrast-enhanced CTDR. Compared with CTU alone, the combined technique of 3D CTU and contrast-enhanced CTDR improved opacification by a statistically significant difference (p = 0.037).

Conclusion: CTU with 3D rendering can accurately depict both normal and abnormal postoperative findings in patients with urinary diversions. Adding enhanced CTDR can improve visualization of the urinary collecting system.

Editorial Comment

Radiologic evaluation of urinary diversion has 4 main objectives: the detection of postoperative complications, the detection of newly developed urothelial tumors, to monitor upper tract distention and to detect metastasis. Various surgical techniques that are used in continent and noncontinent diversions alter the normal anatomy and make the radiologic interpretation difficult. An accurate interpretation can be made only if radiologists become familiar with the various surgical procedures and the appearances of various postoperative anatomic changes.

The type of imaging procedure and the frequency of imaging is dictated by the urologist preference. In most cases, early complications require urgent radiographic evaluation, usually with intravenous urography or CT. Late complications of urinary diversion are more often insidious, and several imaging techniques has been used: intravenous urography ,contrast enhanced CT, pouchograms, fluoroscopic loopogram or CT loopogram. The authors present their results where a multidetector 3D-CT urography associated with a digital scout view of the abdomen and pelvis after intravenous contrast injection (enhanced CTDR), was performed in 24 patients treated by cystectomy or cystoprostatectomy with subsequent urinary diversion. They compared the 2 types of images in the opacification of the urinary collecting system and evaluated whether one technique was superior or complementary to the other for the detection of any type of abnormalities. These patients presented with ileal conduits, right colonic pouches and ileal neobladders. The combined imaging technique of CTU and enhanced CTDR allowed total opacification of the urinary tract in 21 (70%) of 30 cases studied. They found that the middle and distal left ureteral segments and the left ureteroenteric anastomosis were the most common sites that failed to opacify on either CTU alone, enhanced CTDR, or combined CTU and enhanced CTDR. Even with this drawback, there are numerous advantages of CTU over IV urography and fluoroscopic loopogram. The advantage include better evaluation of distal ureter narrowing, tumor recurrence, better detection and localization of urinary calculi and fistulae, identification and characterization of small renal masses, and detection of extra urinary disease. Main limitations of loopogram include: incapacity of retrograde opacification of the upper urinary tract, incapacity of evaluate renal function, and limitation to detect renal masses, tumor recurrence or extra urinary disease. We have used the same technique presented by the authors, for the evaluation of 16 patients with urinary diversions. Similarly, we have observed more difficulties for adequate opacification of the distal portion of the left ureter. In order to improve this visualization, we have added recently, a 250-mL saline bolus during excretory phase. This modification in the technique allowed us to obtain improved opacification of the distal portion of left ureter in 37% of patients. This modification was also useful for better demonstration of narrow fistulas in 2 patients. This is a very good, very well written and nicely illustrated paper. As a radiologist, I found it extremely useful for understanding all the surgical details of the more common surgical procedures used for urinary diversion. There is no doubt that multidetector CTU with 3D rendering has the potential to be the imaging technique of choice for the initial evaluation of patients with urinary diversion.

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