

different types of laparoscopic endovascular staplers so possible complications can be minimized or completely avoided.

In summary, “en bloc” renal hilar ligation using endovascular staplers could be considered in cases of renal cell carcinoma when the absence of infection and/or severe inflammation may contribute for possible arterio-venous fistula formation.

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IMAGING

Combined T2-weighted and diffusion-weighted MRI for localization of prostate cancer

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Objective: The objective of our study was to compare T2-weighted MRI alone and T2 combined with diffusion-weighted imaging (DWI) for the localization of prostate cancer.

Subjects and Methods: T2-weighted imaging and DWI (b value = 600 s/mm²) were performed in 49 patients before radical prostatectomy using an endorectal coil at 1.5 T in this prospective trial. The peripheral zone of the prostate was divided into sextants and the transition zone into left and right halves. T2 images alone and then T2 images combined with apparent diffusion coefficient (ADC) maps (T2 + DWI) were scored for the likelihood of tumor and were compared with whole-mount histology results. Fixed window and level settings were used to display the ADC maps. Only tumors with an area of more than 0.13 cm² (> 4 mm diameter) and a Gleason score of > or = 6 were considered significant. The area under the receiver operating characteristic curve (A(z)) was used to assess accuracy.

Results: In the peripheral zone, the A(z) value was significantly higher (p = 0.004) for T2 plus DWI (A(z) = 0.89) than for T2 imaging alone (A(z) = 0.81). Performance was poorer in the transition zone for both T2 plus DWI (A(z) = 0.78) and T2 (A(z) = 0.79). For the whole prostate, sensitivity was significantly higher (p < 0.001) with T2 plus DWI (81% [120/149]) than with T2 imaging alone (54% [81/149]), with T2 plus DWI showing only a slight loss in specificity compared with T2 imaging alone (84% [204/243] vs 91% [222/243], respectively).

Conclusion: Combined T2 and DWI MRI is better than T2 imaging alone in the detection of significant cancer (Gleason score > or = 6 and diameter > 4 mm) within the peripheral zone of the prostate.

Editorial Comment

Localization of prostate cancer is important for adequate tumor staging, adequate targeting for transrectal ultrasound biopsy and for adequate conservative therapies such as intensity-modulated radiation therapy, interstitial brachytherapy and cryosurgery. Endorectal magnetic resonance techniques that can be used for identification of prostate cancer are conventional T2-weighted image, 3D-spectroscopy, diffusion-weighted image (DWI) and dynamic contrast enhanced technique (DCE). Since the appearance of cancer on T2-weighted image is not specific, several studies have demonstrated that the combination of endorectal MR imaging and

magnetic resonance spectroscopic imaging, can lead to high sensitivity and specificity for peripheral zone tumor localization. DWI is a technique of imaging prostate cancer based on the fact that cancer tissue presents with restriction of the movements of the molecules of water compared with the movement of the molecules of water within normal prostatic tissue. In other words, cancer appears with low apparent diffusion-coefficient values (ADC). Though the authors state that sensitivity of combined T2 and DWI MRI is significantly higher than with T2 imaging alone, we should be alert because both techniques can present false positive (due to prostatitis, focal prostatic atrophy, etc) or false negative results. In our institution, we have been using routinely, in the last 3 years, the combination of these four different techniques: T2-weighted image, 3D-spectroscopic imaging, DWI and dynamic contrast enhanced imaging. Preliminary analysis of our materials has been shown that combining these four techniques provides better sensitivity and specificity for cancer detection and localization.

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Split-bolus MDCT urography with synchronous nephrographic and excretory phase enhancement.

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Objective: Our purpose was to evaluate the utility of CT urography performed using a split contrast bolus that yields synchronous nephrographic and excretory phase enhancement.

Materials and Methods: Five hundred consecutive patients referred for evaluation of possible urinary tract abnormalities (327 for painless hematuria) underwent CT urography with unenhanced scanning of the abdomen and pelvis and scanning during concurrent nephrographic and excretory phase enhancement produced by administration of a split contrast bolus. The enhanced abdomen scan was obtained with abdominal compression; the enhanced pelvis scan was obtained after release of compression. Findings from axial sections and coronal maximum intensity projections were correlated with clinical follow-up and, as available, with laboratory and other imaging studies including cystoscopy, ureteroscopy, urine cytology, surgery, and pathology. Follow-up management for each patient was determined by the clinical judgment of the referring physician.

Results: CT urography identified 100% of pathologically confirmed renal cell carcinomas (n = 10) and uroepithelial malignancies involving the renal collecting system or ureter (n = 8). An additional nine renal masses were identified for which no pathologic proof has yet been obtained, including eight subcentimeter solid renal masses and one multiloculated lesion. Fourteen of 19 confirmed cases of uroepithelial neoplasm involving the bladder were identified. CT urography yielded one false-positive for bladder tumor, two false-positives for ureteral tumor, and one patient with a bladder mass who refused further evaluation. CT urography yielded sensitivity and specificity of 100% and 99% and 74% and 99% and positive predictive value and negative predictive value of 80% and 100% and 93% and 99% for the renal collecting system and ureter and bladder, respectively. CT urography was ineffective in identifying 11 cases of noninfectious cystitis. CT urography also depicted numerous other congenital and acquired abnormalities of the urinary tract.

Conclusion: Split-bolus MDCT urography detected all proven cases of tumors of the upper urinary tract, yielding high sensitivity and specificity. The split-bolus technique has the potential to reduce both radiation dose and the number of images generated by MDCT urography.

Editorial Comment

Multidetector CT-urography (MDCT-urography) has been shown to be an effective single comprehensive examination in the evaluation of patients with hematuria or with risk for the development of urothelial malignancies. Since protocols for MDCT urography varies from each institution, most MDCT urography images are obtained in the unenhanced phase (detection of calculi), nephrographic-phase (detection of renal masses) and excretory-phase (detection of urothelial lesions). The authors present their results with a new protocol called split-bolus MDCT urography where the unenhanced phase is followed only by a combined nephrographic and excretory phase. During split-bolus, CT-urography the intravenous injection of contrast material is performed in two steps. First, 40 ml is injected at 2 ml/s and after 120 second from the beginning of the first injection, the remaining 80 ml is injected. This technique showed high sensitivity and specificity, for the detection of all proven cases of tumors of the upper urinary tract. The main objective with MDCT-urography is to detect all possible causes of hematuria while using the lowest possible radiation dose to the patient. As shown by the authors the split-bolus technique has the potential to reduce both radiation dose and the number of images generated by MDCT urography. In our opinion this protocol is ideal for patients submitted to previous cystoscopy since we might miss some small tumors within a fully distended and opacified bladder. As we have discussed previously in this journal (volume 33, number 3, pages 435-436), we consider “the bladder-wall phase” (scans at 60 or 70 seconds after intravenous injection of the total amount of contrast), essential for the detection of small bladder tumors. However, this “bladder phase wall” has the drawback of significant increase in the effective radiation dose to the patient (18 to 25 mGy).

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UROGENITAL TRAUMA

Selective nonoperative management of penetrating abdominal solid organ injuries

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Objective: To assess the feasibility and safety of selective nonoperative management in penetrating abdominal solid organ injuries.

Background: Nonoperative management of blunt abdominal solid organ injuries has become the standard of care. However, routine surgical exploration remains the standard practice for all penetrating solid organ injuries. The present study examines the role of nonoperative management in selected patients with penetrating injuries to abdominal solid organs.

Patients and Methods: Prospective, protocol-driven study, which included all penetrating abdominal solid organ (liver, spleen, kidney) injuries admitted to a level I trauma center, over a 20-month period. Patients with hemodynamic instability, peritonitis, or an unevaluable abdomen underwent an immediate laparotomy. Patients