Imperative Indications for Conservative Management of Upper Tract Transitional Cell Carcinoma

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Purpose: We report our experience with patients with imperative indications for endoscopic treatment for upper tract transitional cell carcinoma.

Materials and Methods: Between 1983 and 2004 we identified 37 patients with a solitary kidney, bilateral disease or preoperative creatinine greater than 2.0 mg/dL who underwent endoscopic treatment for localized upper tract transitional cell carcinoma. A retrospective chart review was performed.

Results: Of the 37 patients 32 had a solitary kidney, 3 had bilateral disease and 2 had preoperative creatinine greater than 2.0 mg/dL. Median age at diagnosis was 75 years (range 56 to 88). Bladder cytology was positive or atypical in 15 of 31 patients (48%). Tumors were grade 1 to 3 in 2, 13 and 7 patients, respectively, and diagnosed visually in 15. At a median followup of 2.7 years for survivors 23 patients (62%) had a total of 56 upper tract transitional cell carcinoma recurrences. Grade and stage progression occurred in 3 and 3 patients, respectively. Ten of the 23 patients who experienced upper tract recurrence died of transitional cell carcinoma. Overall kidney preservation was achieved in 24 of the 32 patients (75%) with a solitary kidney. At last followup 24 patients had died, including 11 (29.7%) of transitional cell carcinoma, at a median of 2.9 years. Cancer specific survival at 5 years for this cohort was 49.3%.

Conclusions: Our results indicate that upper tract tumor recurrence occurs in a majority of patients with imperative indications for endoscopic treatment, underscoring the need for frequent surveillance. While most kidneys can be preserved, cancer specific death is common.

Editorial Comment

Transitional Cell Carcinoma (TCC) of the Upper Tract is one of the most challenges diseases, especially when involves solitary kidneys. The development of digital imaging may have improved the diagnosis of the TCC in the upper tract, as well as, the treatment of small burden disease with laser technology. The treatment of adjuvant intra-collecting system therapy with BCG or other agents was not expanded in this article due to the small number of patients. It will be helpful to establish a multi-center trial to define the role of conservative endoscopic therapy with adjuvant intra-collecting system chemotherapy agents for upper tract TCC.

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IMAGING

Comparison of Effective Radiation Doses in Patients Undergoing Unenhanced MDCT and Excretory Urography for Acute Flank Pain

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Objective: The purpose of this study was to measure and compare the effective radiation dose in patients undergoing unenhanced MDCT and excretory urography for acute flank pain, and to explore technical and practical factors affecting the effective dose.

Subjects and Methods: One hundred nineteen patients with acute flank pain were included. All patients were examined using both MDCT and excretory urography. CT involved one acquisition from the upper kidney margin to the symphysis pubis. The only protocol variation was in the tube current (mAs), which was made according to patient body mass. The excretory urography protocol consisted of three images, with more when supplementary images were needed. Effective radiation doses were computer-simulated using dosimetry programs for CT and conventional radiography, based on Norwegian Radiological Protection Board dose data sets. Mean and SDs of measured patient doses were calculated and compared. Further analyses of dose variations in body mass categories (body mass index) were conducted, as were analyses concerning the number of images taken.

Results: The mean effective doses were 7.7 mSv with MDCT and 3.63 mSv with excretory urography. The effective dose varied both in and between techniques but could be predicted. Radiation risk decreased significantly with increased patient weight. Conclusion: The average effective dose with MDCT was more than double that with excretory urography. However, the appropriate dose could be strongly predicted by the patient's body mass index and by procedure. An optimum low-dose protocol should be considered before initiating unenhanced MDCT for ureteral colic in order to minimize the radiation-induced cancer risk and to secure adequate image quality.

Editorial Comment

In many institutions, nonenhanced computed tomography has largely supplanted intravenous urography as the primary modality for evaluation of patients suspected of having urolithiasis. As we know, nonenhanced multidetector CT (MDCT) examination, on average, doubled the effective radiation dose to the patient when compared with intravenous urography (if a total of 5 films are obtained). This is particularly important to the young female patients due the direct radiation exposure to the gonads. Some young female patients might present with chronic episodes of urolithiasis, and therefore will be submitted to multiple radiologic examinations during their lifetime The aim of this study was to use commercially available software to evaluate effective radiation doses between different radiologic examination procedures and to explore the relationship between technical and practical factors that could affect the effective radiation dose, both during and between the chosen imaging procedures.

The authors presents an interesting observation; they found that a significantly wide dose range of effective doses with both MDCT and excretory urography, mainly influenced by body size (BMI). Patients of normal weight were exposed to a significantly higher radiation risk with MDCT than with excretory urography when compared with the other weight categories. The mAs with both excretory urography and CT varied considerably according to BMI. With excretory urography, an exponential variation in BMI might be expected from the automatic exposure control system (photo timing). However, with MDCT, the mAs varied as a consequence of subjective considerations. This was possibly caused by operator attempts to avoid an increased noise level for patients with high BMI. Recently, several studies has been show that low-dose MDCT protocols, which delivers radiation dose comparable to those of excretory urography are appropriate for the diagnosis of ureteral stones, and that it provides excellent intraobserver and interobserver agreement and does not obscure alternative diagnosis. Nowadays it is imperative to adapt technical parameters of MDCT on the basis of clinical indication. It is not acceptable to use protocols based on subjective considerations and thus delivering increased radiation risk for patients of normal weight. Based on the authors' conclusion we should keep in mind that BMI should also be taken into consideration because it is too a risk predictor. As a rule, unenhanced optimized low-

dose CT should be used routinely in clinical practice and we must pursue in the development of optimized low-dose MDCT protocols.

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The Utility of Magnetic Resonance Imaging and Spectroscopy for Predicting Insignificant Prostate Cancer: an Initial Analysis

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Objective: To design new models that combine clinical variables and biopsy data with magnetic resonance imaging (MRI) and MR spectroscopic imaging (MRSI) data, and assess their value in predicting the probability of insignificant prostate cancer.

Patients and Methods: In all, 220 patients (cT stage T1c or T2a, prostate-specific antigen level $<$ 20 ng/mL, biopsy Gleason score 6) had MRI/MRSI before surgery and met the inclusion criteria for the study. The probability of insignificant cancer was recorded retrospectively and separately for MRI and combined MRI/MRSI on a 0-3 scale (0, definitely insignificant; - 3, definitely significant). Insignificant cancer was defined from surgical pathology as organ-confined cancer of $</=$ 0.5 cm (3) with no poorly differentiated elements. The accuracy of predicting insignificant prostate cancer was assessed using areas under receiver operating characteristic curves (AUCs), for previously reported clinical models and for newly generated MR models combining clinical variables, and biopsy data with MRI data (MRI model) and MRI/MRSI data (MRI/MRSI model).

Results: At pathology, 41% of patients had insignificant cancer; both MRI (AUC 0.803) and MRI/MRSI (AUC 0.854) models incorporating clinical, biopsy and MR data performed significantly better than the basic (AUC 0.574) and more comprehensive medium (AUC 0.726) clinical models. The P values for the differences between the models were: base vs. medium model, $<$ 0.001; base vs. MRI model, $<$ 0.001; base vs. MRI/MRSI model, $<$ 0.001; medium vs. MRI model, $<$ 0.018; medium vs. MRI/MRSI model, $<$ 0.001.

Conclusions: The new MRI and MRI/MRSI models performed better than the clinical models for predicting the probability of insignificant prostate cancer. After appropriate validation, the new MRI and MRI/MRSI models might help in counseling patients who are considering choosing deferred therapy.

Editorial Comment

Insignificant prostate cancer defined as pathologically organ-confined cancer with a total volume of $\leq$ 0.5 cm 3 and no poorly differentiated component (Gleason grade 4 or 5) on histology is not infrequent but patients with this cancer are very difficult to identify clinically. The authors presented their pioneering work emphasizing that after appropriate validation this new magnetic resonance imaging (MRI) and MRI / magnetic resonance spectroscopic imaging (MRSI) models, might improve the overall accuracy of clinical models in predicting the likelihood of insignificant prostate cancer .Information obtained with conventional MRI and with magnetic resonance spectroscopic imaging were combined with clinical variables and biopsy results in order to build this new clinical nomogram. Both MRI models and the MRI/MRSI model were more accurate than the

clinical models for discriminating insignificant prostate cancer from significant prostate cancer. Since MRSI is more specific than conventional MRI for identification of prostate cancer, one could expect that the MRI/MRSI model was the most discriminating (area under the curve 0.854) and performed significantly better than MRI model alone and other clinical models. As pointed out by the authors the major limitation of the model is that they are vulnerable to upgrading of the biopsy Gleason grade after radical prostatectomy; 26% of the patients of this series had their Gleason scores upgraded. This was particularly important in 7% of the patients of this series. The authors emphasizes that their goal was not produce MRI models ready for clinical use, but rather to test the feasibility of creating such models. In our institution, we already started a prospective clinical study in order to validate this MRI/MRSI model.

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UROGENITAL TRAUMA

Blunt Renal Trauma: Comparison of Contrast-Enhanced CT and Angiographic Findings and the Usefulness of Transcatheter Arterial Embolization

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Background: The purpose of this study was to evaluate the role of contrast-enhanced CT and the usefulness of superselective embolization therapy in the management of arterial damage in patients with severe blunt renal trauma.
Patients and Methods: Nine cases of severe renal trauma were evaluated. In all cases, we compared contrast-enhanced CT findings with angiographic findings, and performed transcatheter arterial embolization (TAE) in six of them with microcoils and gelatin sponge particles. Morphological changes in the kidney and site of infarction after TAE were evaluated on follow-up CT Chronological changes in blood biochemistry findings after injury, degree of anemia and renal function were investigated. Adverse effects or complications such as duration of hematuria, fever, abdominal pain, renovascular hypertension and abscess formation were also evaluated.
Results: The CT finding of extravasation was a reliable sign of active bleeding and useful for determining the indication of TAE. In all cases, bleeding was effectively controlled with superselective embolization. There was minimal procedure-related loss of renal tissue. None of the patients developed abscess, hypertension or other complications.
Conclusions: In blunt renal injury, contrast-enhanced CT was useful for diagnosing arterial hemorrhage. Arterial bleeding may produce massive hematoma and TAE was a useful treatment for such cases. By using selective TAE for a bleeding artery, it was possible to minimize renal parenchymal damage, with complications of TAE rarely seen.