

Objectives: Cytoreductive nephrectomy (CN) is an integral component in treating patients with metastatic renal cell carcinoma. Critics of CN argue that perioperative morbidity or postoperative disease progression may preclude patients from receiving systemic therapy. Laparoscopic cytoreductive nephrectomy (LCN) may allow for reduced morbidity and may increase the likelihood of patients receiving systemic therapy.

Methods: From April 2001 to March 2005, 38 patients underwent LCN at our institution. We evaluated perioperative parameters such as demographics, blood loss, operative time, complications, follow-up time, interval to systemic therapy, and survival. A contemporary open cytoreductive surgery group was evaluated for comparison.

Results: The median patient age was 62 years (range 41 to 82). Most patients had a performance status of 1 or less. The median operative time was 188 minutes, and the median blood loss was 175 mL. All specimens were removed intact. The median tumor size was 8 cm (range 3.5 to 14). The median hospitalization was 3 days. Two major (5.7%) and four minor (11.4%) complications occurred, but no perioperative mortality. Postoperatively, 97.4% of patients were eligible for, or received, systemic therapy at a median of 41 days. The overall median survival was 18.1 months. In contrast to open CN, LCN resulted in decreased blood loss and hospital stay, with no differences in complications, operative time, or interval to systemic therapy.

Conclusions: LCN is a safe and effective surgical approach for select patients with metastatic renal cell carcinoma. Our results have indicated that with proper patient selection, LCN is feasible, morbidity is minimized, and systemic therapy is delivered in a timely fashion.

Editorial Comment

The new possibilities of targeted adjuvant therapy for renal cell cancer encouraged the practice of cytoreductive nephrectomy. One of the pivotal issues against this approach is the possible delay of institution of systemic therapy. With the advent of less invasive surgery, i.e.; laparoscopic cytoreductive nephrectomy, initiation of systemic therapy can be started sooner increasing the possibility of better survival.

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IMAGING

Fat Poor Renal Angiomyolipoma: Patient, Computerized Tomography and Histological Findings

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Purpose: We reviewed our experience with fat poor cases of angiomyolipoma.

Materials and methods: The records of patients with angiomyolipoma, as determined by pathological study, from 1998 to 2004 were reviewed by recording patient demographics and outcomes. Fat poor cases were defined as the failure of imaging to demonstrate fat in a lesion. Computerized tomography and histological characteristics were assessed.

Results: Histologically confirmed angiomyolipoma was found in 15 patients. Multiple lesions were found in 3 of 15 cases (20%). Of these 15 patients who underwent surgery 11 (73%) had unsuspected angiomyolipoma

due to absent fat on computerized tomography and they underwent intervention for presumed renal cell carcinoma. Mean age +/- SD in this group was 54 +/- 15 years and 8 of 11 patients (73%) were female, of whom 4 (50%) had uterine fibroids. These lesions were found incidentally in 7 of 11 cases (64%). Operative complications developed in 2 of 11 patients (18%). Average maximal diameter on pathological evaluation was 3.2 +/- 1.3 cm (range 1.5 to 6). Nonenhanced computerized tomography was available in 7 of 11 cases, of which 3 of 7 (42%) showed hyperdense lesions and 4 of 7 (57%) showed isodense lesions. The percent of fat identified per high power field was less than 25% in 12 of 13 fat poor angiomyolipoma lesions (92%) compared to 2 of 4 classic lesions (50%) known to be angiomyolipoma before surgery ($p = 0.04$).

Conclusions: We suggest that a general definition of fat poor angiomyolipoma should be the failure of imaging to reveal fat within a lesion, thus, making it unsuspected at surgery. A pathological definition should be less than 25% fat per high power field, which to our knowledge is a formerly undefined quantity. Not all cases are hyperdense on nonenhanced computerized tomography. These lesions cannot be reliably identified by imaging and they should be managed like all enhancing renal masses.

Editorial Comment

CT is the method of choice for identification of angiomyolipomas (AMLs), even those with small amounts of fat. However, 5-14% of these tumors do not present detectable fat by CT examination. Classically the finding of a homogeneously hyperdense renal mass on pre-contrast scans with homogeneously and prolonged enhancement on contrast-enhanced scans, has been considered suspicious for AML without radiological evidence of fat.

The authors present an original contribution to this subject by showing that fat poor AMLs tended to have less than 25% fat per high power field when compared with AMLs with radiological evidence of fat. We agree with the authors regarding the unreliable criteria for specific imaging diagnosis of AMLs without radiological evidence of fat. When there is no detectable fat within a single or multiple renal mass by CT, two main differential diagnoses should be considered: renal cell carcinoma and oncocytoma. Thus, CT or US-guided percutaneous biopsy of the renal mass should be performed in order to establish the correct diagnosis before surgery.

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Combined MRI and MR Spectroscopy of the Prostate before Radical Prostatectomy

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Objective: The purpose of this study was to evaluate a routine protocol for combined MR and spectroscopic imaging of the prostate for staging accuracy.

Subjects and methods: Fifty patients with biopsy-proven prostate carcinoma were examined with our sequence protocol, which consisted of T2-weighted fast spin-echo sequences and a pelvic T1-weighted spin-echo sequence. For spectroscopy, we used a 3D chemical shift imaging (CSI) spin-echo sequence. Image interpretation was performed by two radiologists. The total number of tumor voxels and tumor voxels per slice were counted to estimate the tumor volume in every patient. The potential of MR spectroscopy to differentiate between T2 and T3 tumors, based on the estimated tumor volumes, was compared with the staging performance of MRI.

Results: The MR measurement time was 19.01 minutes, and the total procedure time averaged 35 minutes. Seventy-six percent of the spectroscopic examinations were successful. Statistically significant differences in the number of tumor voxels per slice and tumor volumes were found between T2 and T3 tumors. The descriptive parameters of MRI and MR spectroscopy did not differ significantly; sensitivity and specificity were 75% and 87%, respectively, for MRI and 88% and 70%, respectively, for MR spectroscopy. The combination of both methods resulted in only a slight improvement in staging performance and was not statistically significant. Conclusion: Combined MRI and MR spectroscopy of the prostate has no diagnostic advantage in staging performance over MRI alone. The mean tumor volumes, estimated by MR spectroscopy, differ statistically significantly between T2 and T3 tumors.

Editorial Comment

Nowadays, the ideal way to adequately stage prostate cancer is by the combination of conventional MRI techniques and 3D-MR spectroscopic imaging (MRSI). In other words, 3D-MRSI of the prostate must be done together with conventional MRI. MRSI can be useful for the diagnosis and detection of extra-prostatic disease and seminal vesicle invasion based on the capability of estimation of tumor volume and tumor location. The presence of more than 4 contiguous voxels with cancer indicates higher probability of extra-prostatic extension of the disease. The authors of this manuscript concluded that the differences of the staging performance between MRI and MRSI were not statistically significant and thus they do not recommend the routine use of their combined sequence protocol for staging purposes of patients with histologically proven prostate carcinoma. By using their spectroscopic technique, they also had relatively unexpected high rates of false positive (13%) and false negative (25%).

We must consider these data with caution since several important aspects of the technique used by the authors should be discussed since the authors used different parameters from those currently used by other investigators. First 3D-MR spectroscopic imaging is acquired by water and lipid-suppressed double-spin-echo point-resolved spectroscopy sequence, which is optimized for quantitative detection of both choline and citrate. Data sets are acquired as 16 x 8 x 8 phase-encoded spectral arrays (1024 voxels; nominal spatial resolution, 0.34 cm³; 1000/130; acquisition time, 17 minutes. The authors used a 3D-MRSI technique where by choosing k-space-weighted acquisition, the scanning time was shorter, 10 minutes 45 seconds, for a 12 x 12 x 8 scan with a TR of 1,300 milliseconds and four averages. With the application of a Hamming filter, the voxel size was increased from a nominal 6.7 x 6.7 x 10 mm to an effective size of 10 x 10 x 15 mm corresponding to an effective volume of 1.5 cm³. The nominal voxel size obtained by the authors was 0.45 cm³ significantly larger than 0.34 currently used. When we increase the nominal voxel size we might expect undesirable partial volume and loss of spatial resolution. This can be considered one important drawback of their technique and perhaps could explain their higher rates of false-negatives results. Another important point to discuss is that the authors did not mention whether they replaced or not the air within the endorectal coil by liquid perfluorocarbon. Liquid perfluorocarbon is very useful to reduce the high magnetic field susceptibility at the air-tissue interface and improve the quality of MR spectroscopic imaging data (by reducing the line width). Among 50 patients evaluated in this study, the authors had only 38 patients (76%), with MR spectroscopic imaging sufficient for analysis. One might speculate that by using perfluorocarbon within the endorectal coil instead of air their results would be significantly better.

Another point that we must consider is that the authors uses a higher value of the ratio choline + creatine / citrate to consider tumor voxel. They consider, tumor voxel when the ratio of (choline + creatine) / citrate was equal to or higher than 1.1. Although there is no consensus about spectral interpretation, the classification system described by Kurhanewicz et al (1) has been used in the more recent studies on this subject. In that system, voxels are considered suspicious for cancer if the ratio of choline and creatine to citrate is at least 2 standard deviations (SDs) higher than the average ratio for the normal peripheral zone. Voxels are

considered very suspicious for cancer if the ratio of choline and creatine to citrate is higher than 3 SDs above the average ratio (equal or higher than 0.86). By using a considerably higher ratio to consider tumor voxel one could expect larger number of false negative.

In our opinion, the association of conventional MRI and 3D-MRSI is very important for the outcome of a patient with prostate cancer.

Reference

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UROGENITAL TRAUMA

Predicting Major Hemorrhage in Patients with Pelvic Fracture

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Background: Pelvic fractures can be an important source of major hemorrhage in victims of blunt trauma. However, no rapid and reliable noninvasive method exists for predicting which subjects will have major hemorrhage. The objective of this study is to use information available upon presentation to the trauma center to develop a clinical prediction rule to identify subjects with pelvic fracture who are at high risk of major hemorrhage.

Methods: A retrospective cohort study was performed on all subjects with pelvic fracture from blunt force mechanism at a single level one trauma center during a 4.3 year period. Chart review identified findings from initial pelvic radiographs and from emergency department care including mechanism of injury, and hemodynamic status. Major hemorrhage was defined by angiographic findings, transfusion requirement and pelvic hemorrhage volume. Logistic regression was used to formulate a clinical prediction rule to stratify subjects based on probability of major hemorrhage.

Results: Complete data were available on 627 of 783 eligible subjects. Predictors of major hemorrhage included emergency department hematocrit 30 or less, pulse rate of 130 or greater, displaced obturator ring fracture and pubic symphyseal wide diastasis. Combinations of predictors defined groups with probability of major hemorrhage from 1.6% to 66%.

Conclusions: Probability of major pelvic fracture related hemorrhage can be estimated from initial pelvic radiograph, pulse, and hematocrit.

Editorial Comment

When dealing with pelvic fractures and a hypotensive patient (in shock) it is essential to first determine where the bleeding is coming from, whether from the chest, abdomen or pelvis. Initial methods to determine this are by physical exam, plain films of the pelvis and chest, and FAST scan. When the bleeding source is the pelvis,