ENDOUROLOGY & LAPAROSCOPY

Conservative elective treatment of upper urinary tract tumors: A multivariate analysis of prognostic factors for recurrence and progression

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Purpose: We evaluate the safety and efficacy of conservative elective treatment of upper urinary tract tumors, and determine predictive factors for recurrence and progression to optimize indications of this type of treatment.

Materials and Methods: Since 1984 we have performed a prospective study of conservative treatment of single, low grade and stage, less than 3 cm upper tract tumors. The study includes 54 patients with a normal

contralateral kidney who had been followed for more than 36 months. Open conservative surgery was performed in 31 cases and endourological surgery in 23. Minimum followup was 36 months, maximum 210 and mean 84.8. Univariate and multivariate analyses of recurrence and progression were performed in relation to age, sex, association with a bladder tumor, bladder tumor stage and grade, sequence of bladder tumor in relation to upper urinary tract tumor, number of previous bladder tumor recurrences, association with bladder carcinoma in situ, upper urinary tract tumor grade, stage, location, size and therapy, and upper urinary tract cytology.

Results: Of the 54 patients 19 (35%) had recurrence, which was bilateral recurrence in 4, and progression occurred in 9 (16%). At the end of analysis 44 (62.9%) patients were disease-free and alive at a mean time of 92.88 months, 13 (24%) died disease-free at a mean of 72.7 months and 7 (12.9%) died of disease at a mean of 97.85 months. Cause specific mortality occurred in 7 (12.9% cases). Among the 54 initially conservatively treated units 42 (77.7%) kidneys were ultimately preserved. On univariate and multivariate analysis tumor location in the renal pelvis and association with a previous multi-recurrent bladder tumor were variables significantly related to recurrence and progression, as well as bilateral recurrence.

Conclusions: Conservative treatment is an optional approach for select upper urinary tract tumors. The strongest risk factors for recurrence and progression were association with a previous multi-recurrent bladder tumor and tumor location in the renal pelvis but these conditions were also the strongest risk factors for bilateral recurrence. Conservative treatment can also be recommended in these cases but only with compliant patients and close followup.

Editorial Comment

This study is important because it gives us an excellent glimpse into the natural history of conservatively managed upper tract urothelial neoplasms. The authors used a mix of ureteroscopy and open surgery (as an alternative to percutaneous resection) to locally resect the lesions, but otherwise the operative and follow-up regimens are the current endourological state-of-the-art for conservative management of upper tract urothelial neoplasms. Importantly, only solitary lesions of low grade and stage were included. These are the optimal candidates for elective nephron-sparing surgery (the authors did not include in this report the results in patients with a solitary kidney). This is the group of patients in whom we are most tempted to offer conservative treatment, sparing the kidney. How might we expect to do in the long run? With a minimum follow-up of 3 years, and a mean follow-up of 7 years, the authors can give us an excellent answer. We can expect that 1 of 3 will have a recurrence, 1 of 4 will lose their kidney, and that 1 of 8 will die of progression of disease. In univariate analysis, the authors found that a positive upper tract cytology and a history of multiple recurrent bladder tumors were associated with a worse prognosis. This makes sense, as both are markers for more biologically aggressive disease. They also noted that tumors in the renal pelvis carried a worse prognosis than those in the ureter, but this finding is skewed by the patients managed with open surgical distal ureterectomy – which will always be more effective than conservative therapy performed to more proximal lesions because all of the “downstream” upper tract urothelium is removed. The long term follow-up provided in this paper is supportive of the concept of conservative management for solitary upper tract tumors of low grade and stage, and provides good figures that we can use to counsel patients.

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Incomplete renal tumor destruction using radio frequency interstitial ablation

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Purpose: We evaluate the efficacy of temperature based radio frequency ablation as a potential treatment modality for small (less than 3.5 cm) renal tumors.

Materials and Methods: We treated 15 patients with a total of 20 tumors with radio frequency ablation through an open surgical approach immediately before partial nephrectomy. All tumors were biopsied before radio frequency ablation treatment. Tumors were heated to 90 to 110C for 6 to 16 minutes (mean 9.1). Tumor ablation was monitored by direct vision and ultrasound. Partial nephrectomy was performed in standard fashion. All specimens were stained with hematoxylin and eosin, and 5 specimens were stained for nicotinamide adenine dinucleotide (NADH) diaphorase activity.

Results: Tumors ranged from 1.5 to 3.5 cm. (mean 2.4) in greatest dimension. All 20 specimens had evidence of morphologically unchanged tumor and normal renal parenchyma on standard hematoxylin and eosin staining. Of the 5 specimens 4 stained positively for NADH in areas confirmed to be tumor in hematoxylin and eosin stained neighboring sections. There was 1 intraoperative renal pelvic thermal injury requiring pyeloplasty and 2 postoperative caliceal leaks requiring stent placement.

Conclusions: In our series radio frequency therapy did not result in total tumor destruction when specimens were examined with hematoxylin and eosin or NADH staining. We believe that radio frequency interstitial tumor ablation of renal cell carcinoma without subsequent tissue resection should continue to be an investigational treatment modality for those who would otherwise undergo partial or radical nephrectomy.

Editorial Comment

In many ways, the kidney would seem to be a wonderful organ to which to apply “needle-invasive” or extracorporeal therapy for malignancies. It is fairly consistently oriented, it can be accessed through a pathway (the retroperitoneum) that avoids any vital organs, and it is easily imaged. Moreover, malignancies in the kidney are more often being detected when they are small, and therefore more amenable to these minimally invasive techniques. Finally, urologists have long had a close working relationship with radiologists, who are the ones in many institutions who control the mechanisms used in the application of these techniques. It is not surprising, then, that there has been such great interest in “needle-invasive” or extracorporeal treatments for renal masses suspicious for malignancy. This article throws a bit of caution back to the enthusiasts of one of the emerging techniques, radio frequency ablation. In their series of 15 patients with 20 tumors, treated with an open surgical application of radio frequency ablation immediately prior to partial nephrectomy, there was incomplete tumor destruction as assessed by HE staining in all 20 tumors. As this stain may overestimate the viability of cells immediately after thermal coagulation, the authors assessed the histology with NADH stain in the last 5 tumors. NADH stain evaluates for enzymatic activity that may more accurately determine viability of the cells. With this stain, however, 4 of 5 specimens still appeared to have incomplete tumor destruction. Looking at the varied results of radio frequency ablation for renal tumors that have been reported in the literature, one obvious conclusion is that the technical aspects of the procedure are critical and not yet completely defined. Results from reputable institutions have varied from excellent to, as in this article, poor. It might be that these investigators’ open surgical application was based more on misleading visual needle localization than radiographic localization. Some might argue that the parameters of the treatment were not optimal. Alternatively, it may be that these authors’ assessment methods were in fact more accurate than those of others were, and that is the reason for their poor (more accurate) results. Whatever the reasons for the extreme variations, it is certain that

the answer is not going to be easily attained. With this degree of variation and uncertainty, I agree with the authors that radio frequency ablation of renal masses suspicious for malignancy should still be considered investigational at this time.

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