CORRELATION OF URETEROSCOPIC APPEARANCE WITH HISTOLOGIC GRADE OF UPPER TRACT TRANSITIONAL CELL CARCINOMA

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ABSTRACT

Objectives. To correlate urologists’ impressions of the tumor grade of upper tract tumors at ureteroscopy with the histologic findings after biopsy or resection.

Methods. A retrospective review of all patients who underwent diagnostic or therapeutic ureteroscopy for upper tract transitional cell carcinoma (TCC) between 1992 and 2002 was performed. Only patients who had proven TCC with a descriptive narration of the urologists’ impressions of tumor grade and a representative pathologic specimen were included. The urologist’s impression of tumor grade was reported as low or high grade according to the operative report and was correlated with the histologic grade. A total of 40 tumors met inclusion criteria.

Results. Ureteroscopy classified 28 tumors as low grade, 10 as high grade, and 2 as benign. The histologic findings of the 28 tumors believed to be low grade on ureteroscopy showed that 20 (71%) were grade 1-2, and of the 10 tumors believed to be high grade, 8 (80%) were actually grade 3-4. The overall accuracy of ureteroscopy in predicting the tumor grade of upper tract TCC was 70%. The benign-appearing lesions proved to be malignant.

Conclusions. The urologists’ impressions of tumor grade on ureteroscopy were relatively good. However, visual assessment alone was inaccurate in 30% of the cases in our series. Therefore, we believe that biopsies remain essential for accurate grading of upper tract TCC. Therapeutic decisions should not be based solely on visual ureteroscopic assessment of tumor appearance.
pression of tumor grade has not been correlated with the histologic grade of upper tract TCC. We correlated the visual ureteroscopic appearance of upper tract TCC grade with the actual histologic grade to document whether ureteroscopy can reliably detect low-grade tumors that may be suitable for fulguration or laser ablation.

MATERIAL AND METHODS

After institutional review board approval and informed consent exemption, a retrospective review of all patients who underwent diagnostic or therapeutic ureteroscopy for upper tract TCC between 1992 and 2002 was performed. Only patients who had proven TCC with a descriptive narration of the urologists’ impression of tumor grade were included. Specimens were obtained by cup forceps, flat wire basket, graspers, or an 11.5F resectoscope. Patients with suspected TCC preoperatively who had a final non-TCC diagnosis were excluded. In addition, patients who did not have a clear documented description of the urologist’s impression of tumor grade in the operative report were excluded, along with those who did not have a definitive pathologic grading. A total of 40 tumors met the inclusion criteria.

The urologists’ impression of tumor grade was reported as low or high grade according to the operative report and was correlated with the histologic grade. The visual criteria for low grade included, but were not restricted to, papillary architecture, small-size tumors, narrow base, and no associated features of high-grade tumors. The high-grade criteria included velvety patches of erythematous mucosa, large tumors, sessile growth, and infiltrating, nodular, or flat intraepithelial growth.

Tumors were histologically classified according to the World Health Organization International Society of Urological Pathology consensus classification of TCC and were graded as low (grade 1-2) or high (grade 3-4) grade.

RESULTS

Table 1 demonstrates the urologists’ visual impressions of the appearance of tumor grade compared with the actual histologic grade of upper tract TCC. Of the 40 tumors, 28 were classified as low grade, 10 as high grade, and 2 as benign. The histologic examination of the 28 tumors believed to be low grade on ureteroscopy showed that 20 (71%) were grade 1-2 and 8 were grade 3-4. The 10 tumors believed to be high grade on ureteroscopy, 8 (80%) were actually grade 3-4 and 2 were grade 1-2. Importantly, one of the two lesions thought to be benign was low-grade TCC and the other was high-grade TCC. The overall accuracy of the visual ureteroscopic grade determination of upper tract TCC was 70%.

COMMENT

Ureteroscopy can identify upper tract cancer and is useful in differentiating malignant and benign lesions.10–13 In a retrospective study, rigid ureteropyeloscopy was used in 43 patients with upper urinary tract urothelial tumors. The diagnosis was confirmed in 86% (19 of 22) of renal pelvic tumors and 90% (19 of 21) of ureteral tumors compared with 55% and 52% using the standard diagnostic approach, which included intravenous urography, retrograde pyelography, and selective urine cytology.10 In a prospective study of 12 patients with filling defects, the provisional diagnosis from the standard diagnostic regimen was accurate in only 7 (58%) of 12 patients, and the results of rigid ureteropyeloscopy proved to be correct in 10 (83%). The diagnostic accuracy for upper tract TCC was 4 (80%) of 5.11 Early reports on flexible ureteroscopy confirmed its sensitivity and specificity for the diagnosis of upper tract lesions. Kavoussi et al.12 reported an 84% overall diagnostic and/or therapeutic success rate in 76 procedures. Four (100%) of four upper tract TCC were accurately identified.12 Subsequently, a large series confirmed these results. Using flexible ureteroscopy, 23 (92%) of 25 lesions were correctly diagnosed as upper tract TCC among 62 patients with filling defects. The endoscopic appearance in most patients was that of typical papillary TCC as seen in the bladder.13

Grade on ureteroscopic biopsy accurately predicts the tumor grade in the open surgical specimens.8,14 Of 30 low or moderate-grade ureteroscopic specimens, 27 (90%) proved to be low or moderate-grade TCC in the surgical specimen, and 11 (91.6%) of 12 high-grade ureteroscopic specimens proved to be high-grade TCC.8 Similarly, the ureteroscopic biopsy grade matched the surgical pathologic grade in 31 (78%) of the 40 cases and was lower than the surgical pathologic grade in the remainder.14

The tumor grade of open surgical specimens correlates with the tumor stage of upper tract TCC.4–7 In a contemporary series of 108 patients with upper urinary tract TCC who underwent surgical treatment, all patients (n = 51) with histologic low-grade tumors (grade 1) had superficial stage disease (100% Stage pT1 or less). Patients with high-grade tumors (grade 2-3) had overwhelmingly high-stage invasive disease (79% pT2 or greater).7 Similarly, the ureteroscopic tumor grade correlates with the pathologic stage. Of 30 low or
staging modality.14,15

scopic biopsy has not been shown to be an accurate tumor grade, as well as with tumor stage.4 Both that for super tract TCC is becoming, in all respects, similar to dic surveillance of conservatively managed upper ech convention of the upper tract TCC. Therefore, it appears that grade is an acceptable surrogate for stage, all limitations considered. Thus, it has been demonstrated that ureteroscopy can correctly differentiate between benign and malignant upper tract lesions and that grade on ureteroscopic biopsy correlates accurately with tumor grade in the open surgical specimen. In addition, the tumor grade on ureteroscopic biopsy, as well as the open surgical specimen, correlates with the tumor stage of TCC at open resection. The next logical step, therefore, was to determine whether visual inspection on ureteroscopy could predict tumor grade on biopsy.

Why would a urologist “guess” what the tumor grade is when a pathologist can “confirm” it on a biopsy specimen? First, histologic grading is not always possible on biopsy specimens. In two large series, grading of the ureteroscopic specimens was possible in 82% and 88% of cases.8,15 Second, most urologists have a set of criteria that they believe allows them to differentiate visually between low and high-grade tumors. These criteria are commonly used, not always alone, but often in conjunction with other selection criteria, in decision making for definitive endoscopic treatment of upper tract TCC. In the Mayo Clinic series on conservative endoscopic management of upper tract TCC with a normal contralateral kidney, one of seven selection requirements was that “all lesions [be] papillary and superficial in appearance (as judged by an experienced endoscopist).”3 Another consideration is the advent of office-based ureteroscopy performed under local anesthesia using small-caliber flexible scopes.16 Using this approach, periodic surveillance of conservatively managed upper tract TCC is becoming, in all respects, similar to that for superficial bladder tumors. Small superficial recurrences could be amenable to laser vaporization or electrical fulguration in the same setting, obviating the need for biopsy and scope reinsertion and eliminating the associated complications and logistical considerations. Unfortunately, the results of our study did not support this practice, because 30% of all cases were misclassified by ureteroscopy, including two benign-appearing lesions, which were malignant on biopsy. The sensitivity of visual ureteroscopic grading was 71% for low-grade tumors and 80% for high-grade tumors. The stability of the tumor grade must be factored into the decision process regarding endoscopic treatment of recurrences. In-office treatment without biopsy of low-grade-appearing tumors with previous histologic documentation of grade stability may be an alternative in patients with multiple low-grade recurrences. However, these criteria apply only to a small subset of patients. It was beyond the scope of this study to determine whether such a practice is safe.

Recently, similar work correlating cystoscopy with the grade and stage of bladder tumors was published. Conflicting data have come from two institutions. Herr et al.17 found that cystoscopy alone correctly predicted the tumor stage and grade of 93% of Stage Ta, grade 1 recurrent bladder tumors. These investigators concluded that urologists could identify noninvasive, low-grade, recurrent papillary bladder tumors, and that they may treat them with outpatient fulguration. However, Cina et al.18 concluded that urologists could not readily distinguish between low and high-grade papillary urothelial lesions, because only 81% of papillary tumors thought to be low grade on cystoscopy were histologically proven to be low-grade cancers; 67% of high-grade cancers were predicted correctly.

The present study was not a controlled randomized study. The results were limited by the retrospective study design. The surgeons’ impressions might have been biased by the results of other preoperative diagnostic tests. Also, not all tumors were recurrent after endoscopic management; rather they constituted a heterogeneous group. Also, only including cases in which the visual appearance of the tumor grade was available represents a selection bias. Finally, surgeons may not have focused their attention on the grade of the lesion as they might have done if the study had been conducted prospectively.

CONCLUSIONS

The present state of ureteroscopic inspection of the upper urinary tract alone does not provide a sufficiently reliable estimate of tumor grade. The definitive diagnosis and staging of primary or recurrent upper tract TCC requires a combination of analytic tests, none more important than the histopathologic analysis of biopsy material. A prospective study correlating the ureteroscopic grade of recurrent papillary upper tract tumors with the histologic grade would help to clarify the sensitivity and specificity of this technique further. Therefore, therapeutic decisions should not be based solely on visual ureteroscopic assessment of tumor appearance.
REFERENCES


EDITORIAL COMMENT

This retrospective study documented the inaccuracy of the determination of upper tract tumor grade by visual inspection alone. Among those thought to be low grade, 71% were, in fact, low grade and of the other 10 tumors thought to be high grade, 8 (80%) were actually high grade. Two lesions thought to be benign were, in fact, TCC, bringing their overall accuracy of visual grade determination to 70%.

The interest in doing such a study was to indicate the potential for in-office ureteroscopic treatment of upper tract neoplasms. However, in-office treatment is much more likely to be performed during surveillance after a diagnosis of neoplasm and grade with, presumably, endoscopic treatment.

Previous studies have shown the value of ureteroscopic biopsy in determining the nature and grade of an upper tract neoplasm.1,2 We have found stability of the tumor in subsequent recurrences.

Therefore, during surveillance, visual inspection alone may have a satisfactory margin of error. In the initial diagnosis of an upper tract lesion, biopsy with histologic confirmation should be considered appropriate.

Ureteroscopic biopsy can have its problems. The earlier series stressed the importance of the different techniques for handling the specimens and the value of multiple samples. A more recent presentation indicated the inaccuracy of diagnosis from ureteroscopic biopsy at one institution.3

This report again demonstrates the marked change toward an endoscopic approach to the diagnosis and treatment of upper tract neoplasms and points out the need for more accurate diagnostic techniques.

REFERENCES


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