

Prognosis-Related Analysis of Renal Pelvic Cancer

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OBJECTIVE To promote the diagnosis and therapeutic results for renal pelvic cancer.

METHODS The prognosis-related factors in 47 cases with renal pelvic cancer were analyzed retrospectively.

RESULTS The overall 3 and 5-year survival rates for renal pelvic cancer patients were 65.9% (31/47) and 51.1% (24/47), respectively. The 5-year survival was 55% (23/40) in organ-confined cancer and 26.7% (2/7) with coexisting multi-organ involvement ($P>0.05$). The 5-year survival was 38.7% (12/31) in cases with a tumor >2.5 cm and 75% (12/16) in the cases with tumor ≤ 2.5 cm ($P<0.05$). The 5-year survival was 37.9% (11/29) in cases with serious hydronephrosis, which was significantly lower than the 72.2% (13/18) found in those with slight hydronephrosis ($P<0.05$). According to the histological grade, the 5-year survival was 100% (6/6) in patients with a G1 tumor, 65.2% (15/23) with G2, and 16.7% (3/18) with G3 ($P<0.01$). Based on the pathologic stage, the 5-year survival of cases was 84.6% (11/13) with T1 tumors, 60% (12/20) with T2, and 7.1% (1/14) with T3~T4 ($P<0.01$). Patients with a G2T2 or higher staging tumor, who underwent radical nephroureterectomy with partial bladder resection by a transabdominal approach had a significantly higher 5-year survival than those who underwent nephrectomy or nephroureterectomy with partial bladder resection via a lumbar approach ($P<0.05$). There was no significant difference between the 5-year survival of patients with recurrence of bladder carcinoma compared to patients without recurrence ($P>0.05$).

CONCLUSION The tumor grade and stage are the key points for prognosis. Radical nephroureterectomy with partial bladder resection is an effective method to improve the prognosis of patients with a high grade and high stage tumor.

KEYWORDS: renal pelvic cancer, prognosis.

Renal pelvic cancer is characterized by a low incidence, few symptoms and poor prognosis. To improve the therapeutic results, patients with renal pelvic carcinoma treated at our hospital were followed-up and the prognostic factors analyzed retrospectively.

MATERIALS AND METHODS

Patients

Forty-seven patients with renal pelvic carcinoma who were treated at China Medical University, Shenyang, from August 1982 to March

Received April 29, 2004; accepted June 4, 2004.

1994 were reviewed and their prognostic factors investigated. The patients consisted of 40 cases with organ-confined cancer and 7 cases with coexisting multi-organ involvement (renal pelvic-ureter carcinoma, renal pelvic-bladder carcinoma, and renal pelvic-ureter-bladder carcinoma). There were 32 men and 15 women, ranging in ages from 34 to 78 years with a mean of 57.8 years. Tumors occurred on the right side in 25 cases, and on the left side in 22 cases. Seventeen patients underwent radical nephroureterectomy with resection of the bladder cuff by a transabdominal approach, 7 patients received nephrectomy, 11 patients nephroureterectomy (without partial bladder resection), and 12 patients nephroureterectomy with resection of the bladder cuff.

Tumor stage and grade were defined according to UICC and WHO classification: 6 cases were G1; 23, G2; 18, G3; and 13 cases were T1; 20, T2; 14, T3~T4. Follow-up duration ranged from 5 to 11 years.

Statistical methods

Chi-square analysis was used to compare the differences among groups, and the prognosis was analyzed with the Kaplan-Meier curves and Log-rank test.

RESULTS

According to the Kaplan-Meier curves (Fig. 1), the 3 and 5-year survival rates of renal pelvic carcinoma patients were 65.9% (31/47) and 51.1% (24/47), respectively. The difference between the 5-year survival of men (53.1%, 17/32) and women (46.7%, 7/15) was not significant ($P>0.05$). The 5-year survival of cases with renal pelvic carcinoma on the left and right was 40.9% (9/22) and 60.0% (15/25), respectively, showing no significant difference ($P>0.05$). There was also no significant difference in the 5-year survival between cases with organ-confined cancer (55.0%, 22/40) versus cases coexisting with multi-organ cancer (26.7%, 2/7). Compared with the higher survival rate (75%, 12/16) with smaller tumors ($d \leq 2.5$ cm), the 5-year survival (38.7%, 12/31) of cases with bigger renal pelvic tumors ($d > 2.5$ cm) was relatively low, resulting in a significant difference between them ($P < 0.005$). Based on the IVU results, the patients were divided into two groups: patients with heavy hydronephrosis were classified as group A, whose 5-year survival was 37.9% (11/29); patients with slight hydronephrosis were classified as group B, whose 5-year survival was 72.2% (13/18). There was

significant difference between groups A and B ($P < 0.05$). The 5-year survival (25%) for patients with positive urine cytology was significantly lower than those patients (60%) with negative results. The association of the tumor size, IVU results, urine cytology, histologic grade and pathological stage was analyzed and is shown in Table 1.

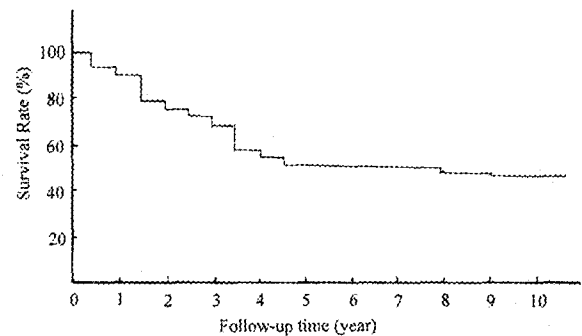


Fig.1. The Kaplan-Meier curve for renal pelvic carcinoma.

Table 1. Association of tumor size, IVU results, urine cytology with histologic grade and pathological stage

Factors	Grade			Stage		
	G1	G2-G3	P	T1	T2-T4	P
Tumor size						
>2.5 cm	1	30	<0.01	5	26	<0.05
≤2.5 cm	5	11		8	8	
IVU						
A	0	29	<0.01	0	29	<0.01
B	6	12		13	5	
Cytology						
Positive	1	11	>0.05	1	11	>0.05
Negative	5	30		12	23	

The survival curves based on the histologic grade and pathological stage of renal pelvic cancer are shown in Figs. 2 and 3. The 5-year survival for patients with increasing tumor grades was as follows: G1 was 100% (6/6); G2, 65.2% (15/23); G3, 16.7% (3/18) with the differences among them being significant ($P < 0.01$). Based on the pathological stage, the 5-year survival for patients with tumors of the following were: T1, 84.6% (11/13); T2, 60% (12/20); T3~T4, 7.1% (1/14) with the differences among them also being significant ($P < 0.05$). According to the surgical methods, the cases were divided into two groups: group I was composed of patients undergoing radical nephroureterectomy with

resection of bladder cuff via the peritoneum, whose 5-year survival was 64.7% (11/17); group II was composed of patients undergoing nephrectomy, nephroureterectomy without partial bladder resection, or nephroureterectomy with partial bladder resection, whose 5-year survival was 43.3% (13/30). There was no significant difference between the two groups. The 5-year survival in patients with nephrectomy, nephroureterectomy without partial bladder resection, and nephroureterectomy with partial bladder resection was 28.6% (2/7), 36.4% (4/11) and 63.3% (7/12), respectively. There was no significant difference among them. The association of surgical approach, histological grade and pathological stage is shown in Table 2.

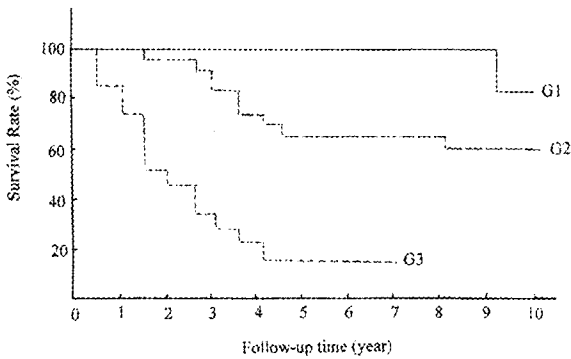


Fig.2. The Kaplan-Meier curves based on histologic grade of renal pelvic carcinoma.

Four patients with a postoperative recurrence in the remaining ureter underwent ureterectomy with partial bladder resection, 9 patients with a recurrence in the bladder underwent TUR-B or partial bladder resection, and 1 case received a radical cystectomy and Bricker operation. There was no significant difference in the 5-year survival between the cases with a postoperative recurrence in the bladder and the cases without a recurrence ($P > 0.05$).

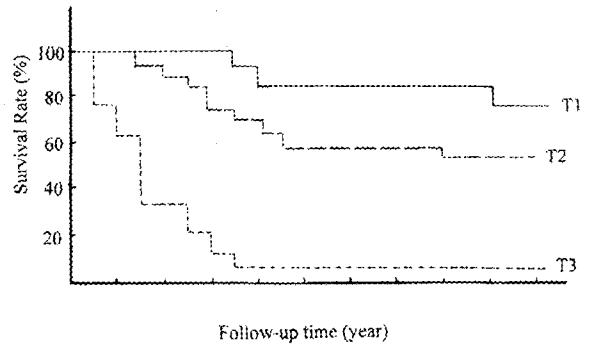


Fig.3. The Kaplan-Meier curves based on the pathological stage of renal pelvic carcinoma.

DISCUSSION

Renal pelvic carcinoma accounts for 18% of all urothelial cancers and has shown an increasing incidence in recent years. Because the muscle wall of the renal pelvis is thin, surrounding tissue invasion and lymph node involvement occur early, resulting in a poor prognosis. It has been reported that the survival rate was 91.3% at 1 year, 83.8% at 3 years, and 79.4% at 5 years for patients with carcinoma of the renal pelvis and ureter.^[1] In our study, the survival rate was 65.9% at 3 years, and 51.1% at 5 years for patients with renal pelvic carcinoma. Some reports have shown that this disease is more common in men than in women. In our series, the male-to-female ratio was 2 to 1, which is consistent with previous literature. Munoz et al.^[2] pointed out that female patients had a poor prognosis because they usually had an invasive carcinoma and are older than men with the same pathology. In our study we found that there was no significant difference between survival with regard to gender or the side where the tumor formed.

Transitional cell carcinoma often behaves as multicentric malignancy in which the entire urothelium from the renal pelvis to the urethra is

Table 2. Association of surgical approach, histologic grade, pathological stage with survival

Surgical approach	G1			G2-G3			T1			T2-T4		
	Cases	S ≥ 5y	P	Cases	S ≥ 5y	P	Cases	S ≥ 5y	P	Cases	S ≥ 5y	P
I	2	2	>0.05	15	10	<0.05	3	2	>0.05	14	8	<0.05
II	4	4		26	8		10	2		20	5	

S: survival P: P value

susceptible to malignant transformation. In a previous report,^[3] 17% of patients had multifocal urothelial carcinomas simultaneously. In our study, multifocal urothelial carcinomas accounted for 14.9% of the patients. Simultaneous multifocal urothelial carcinoma resulted from tumor implantation or multicentric carcinogenesis, while renal pelvic carcinoma accompanied with carcinomas of the ureter and bladder, reflecting the degree of tumor malignancy, might be mainly associated with tumor implantation. In our study, there was no significant difference between 5-year survival of patients with organ-confined cancer and those with simultaneous multi-organ cancer, which probably is due to our small number of cases. But it was notable that patients with multi-organ cancer had lower 5-year survival than those with organ-confined cancer, suggesting a poorer prognosis for the former.

Many factors such as tumor grade, stage, lymphatic metastasis, and vessel invasion play a role in the prognosis of renal pelvic carcinoma.^[14,5] Of these factors, differentiation of tumor cells and invasion depth are most important. A previous report^[6] had shown that patients with a G3 tumor had a significantly shorter survival than those with a G2 tumor, and the survival decreased according to the increase of the tumor stage. In our study, there was a significantly lower 5-year survival in the group with a higher tumor grade and stage than in the group with a lower tumor grade and stage. Some researchers^[2,7,8] have found that: (1) coincidence of the tumor grade with the stage; (2) a thin wall of the renal pelvis allowing easy lymphatic metastasis resulted in early invasion even from low malignant tumors, causing a poor prognosis. So the tumor stage might be a more useful index for prognosis. But in our present study, 2 cases with a T1G3 tumor died of recurrence and metastasis postoperatively, one at 1.5 years and the other at 2 years. Our data suggest that even a lower stage, but with poor differentiation, still predicts poor prognosis.

Tumor size correlates with both tumor malignancy and the period of tumor genesis. In our study, the tumor stage and grade were higher in groups with bigger tumors than in groups with smaller tumors. The patients with a tumor > 2.5 cm had lower 5-year survival than those with a tumor ≤ 2.5 cm, which suggests that tumor size is related to the prognosis of renal pelvic carcinoma. Changes of IVU images are usually related to tumor malignancy and invasion depth in renal pelvic carcinoma, which results from

obstruction of the urinary tract caused by tumor invasion. Patients with bigger tumors accompanied with deep invasion and long-term obstruction, show significant hydronephrosis and hydrocalycosis, which consequently cause the renal function damage. In our series, patients with IVU images of heavy hydronephrosis and hydrocalycosis had a significantly lower 5-year survival than those with slight abnormal or normal IVU images. This result is consistent with a previous report,^[9] and supports the opinion that changes of IVU images correlate with prognosis. It has been reported that about 70% of patients with urothelial carcinomas can be detected by urine cytology, but only 29.5% were detected in our study. Although we did not find an association of a positive relationship of urine cytology with tumor stage and grade, patients with positive results had a poorer prognosis than those with negative results.

Various therapies will result in different therapeutic effects for renal pelvic carcinoma.^[10,11] The standard operation for renal pelvic carcinoma is nephroureterectomy with resection of the bladder cuff. Patients treated with a radical operation have longer survival than those treated with a non-radical operation. In our study, there was a significant difference in survival between the group who underwent a radical operation by a transabdominal approach versus the group who underwent nephrectomy, nephroureterectomy, or radical operation by a flank approach. But considering the tumor stage and grade, a radical or non-radical operation resulted in similar survival for patients with a T1G1 tumor. On the other hand a radical operation by a transabdominal approach resulted in a higher 5-year survival than did a non-radical operation for patients with a tumor over T2G2. It is well-known that there are higher recurrent rates when the carcinoma involves the ureteral stump, bladder and ureteral orifices. So we suggest that nephroureterectomy with resection of the bladder cuff by a flank approach is suitable for the patients with a T1G1 tumor, while a radical operation by a transabdominal approach is better for the patients with tumors over T2G2.

Results differ concerning postoperative recurrence and survival of bladder cancer patients. Some researchers^[12] reported that the 5-year survival was 59.3% for patients without associated bladder carcinomas, and 82.5% for patients with recurrence of bladder carcinoma. They drew the conclusion that recurrence of bladder carcinoma postoperatively might present a good prognosis, because the original tumors

of these patients were low-stage or low-grade. Hisataki et al.^[1,3] found there was no significant difference of survival rates between the patients with or without a recurrence of bladder carcinoma,^[13,14] which is consistent with our data. Our conclusion is that recurrence of bladder carcinoma postoperatively does not influence the postoperative prognosis of renal pelvic carcinomas.

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