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Complication of Renal Neoplasms with Cystic Disease: An Indication for Nephrectomy in Potential Transplant Recipients

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Thirty-five (1.1%) out of a total of 3,133 autopsied cases of renal tumors were complicated by renal malignant tumors and cystic renal disease. They accounted for 1.4% of 2,417 cases of renal malignant tumors and for 4.7% of 751 cases of cystic renal disease. Among the 35 complicated cases, 10 cases or 28.6% were free of metastasis. The incidence of complicated cases and those without metastasis aged over 60 years or over was 12.2% and 29.2% respectively, while the 10-59 year-old age group displayed a lower incidence of 3.6% and the same incidence of 27.3% respectively. In 26 out of 35 cases the malignant tumors was renal adenocarcinoma with no evidence of metastasis in nine cases (34.6%).

Although it is unknown whether cystic renal disease undergoes malignant changes, not all of the patients undergoing chronic hemodialysis should be indicated for nephrectomies since such patients with renal malignancies are mostly elderly and are frequently free from metastases.

(Key Words: Transplantation, Cystic Disease, Kidney, Cancer, Chronic Renal Failure)

INTRODUCTION

With the prolongation of survival of patients with chronic renal failure maintained on long-term hemodialysis or by renal transplantation, renal atrophic conditions or acquired cystic renal disease and the possible development of malignant changes are presenting clinical problems. The indication of nephrectomy in potential transplant recipients has been assessed by various groups of investigators in view of the high incidence of renal tumors, especially in cases of renal transplantation because of cystic renal disease (2, 4, 5, 7, 8, 11, 12).

However, the exact incidence of renal malignant neoplasms in patients with cystic renal disease and that of renal tumors in patients with renal transplantation are not known because of the difficulty of clinically diagnosing the complication.

This study was performed to explore the incidence of complicated cases in autopsies, and the indications of nephrectomy in potential transplant recipients is discussed.

MATERIALS AND METHODS

The 3,133 autopsied cases of renal tumors reported in the 1958-1979

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issues of the Annuals of Autopsy Cases in Japan (Japanese Pathological Society) were reviewed (9). These included 2,417 cases of malignant neoplasms (77.1%) and 751 cases of cystic renal disease (24.0%), 35 of which (1.1%) were complicated. Four of the 35 cases which underwent nephrectomy for treatment of the renal tumor had contralateral cystic renal disease. It is not known whether there was cystic renal disease in addition to renal tumors in the removed kidneys in any of the 424 nephrectomized cases, nor is it known if cystic renal disease was ipsilateral or contralateral in relation to the renal neoplasms in the 31 cases of complications. No information was available on types of cystic disease of the kidney. Durations after transplantation and of hemodialysis in these autopsied cases with renal transplantation and hemodialysis were unknown. The Chi-square test was used for statistical analysis

RESULTS

1. There were 35 cases (1.1%) of renal malignant neoplasms complicated by cystic renal disease among the 3,133 cases of renal tumors studied. These accounted for 1.4% of the 2,417 cases of renal malignant tumors and for 4.7% of the 751 cystic renal disease cases (Table 1).

Table 1 Frequencies of renal malignant tumors complicated by cystic disease and those without metastasis

Renal tumors	A: No. of cases	B: Complicated cases (B/A%)	C: Metastasis-free cases (C/B%)
D: Total cases	3,133	35 (1.1)	10 (28.6)
E: Renal malignant tumors (E/D)	2,417 (77.1)	35 (1.4)	
F: Renal adenocarcinoma (F/E)	1,828 (75.6)	26 (1.4)	9 (34.6)
Urothelial tumors of pelvis	368 (15.2)	7 (1.9)	1 (14.3)
Wilms' tumor	194 (8.0)	1 (0.5)	0
Renal sarcoma	27 (1.1)	1 (3.7)	0
G: Cystic renal disease (G/D)	751 (24.0)	35 (4.7)	
H: Under 10 years of age (H/G)	251 (33.4)	0	0
10-59 years of age	304 (40.5)	11 (3.6)	3 (27.3)
Over 60 years of age	196 (26.1)	24 (12.2)*	7 (29.2)

* $P<0.05$

2. Among the 35 complicated cases, 10 cases or 28.6% were free of metastasis. the incidence of complicated cases and those without metastasis aged 60 years or over was 12.2% (24/196 cases) and 29.2% (7/24 cases) respectively, while the 10-59 year-old age group displayed a lower incidence of 3.6% (11/304 cases) and the same incidence of 27.3% (3/11 cases) respectively (Table 1).

3. In 26 out of 35 cases (74.3%) the malignant tumor was renal adenocarcinoma, with no evidence of metastasis in nine cases (34.6%) (Table 1).

The 26 complicated cases showed an age-distribution with a high frequency at 60-69 years of age. Thus, there was a greater resemblance to the whole series of renal adenocarcinomas than to cystic renal disease cases (Fig. 1).

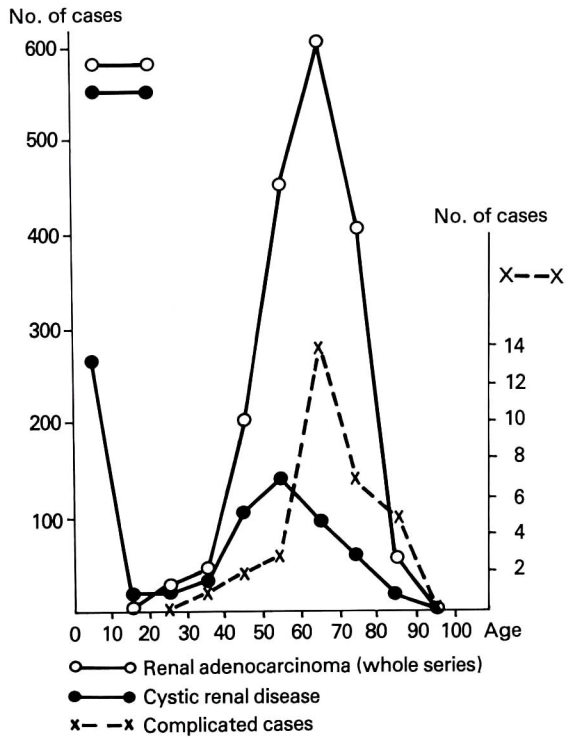

Fig. 1 Age incidences of renal adenocarcinoma, cystic renal disease and complicated cases.

4. The sex ratio (males: females) of the cases of cystic renal disease was 1.4:1, and that of the cases of renal adenocarcinoma was 3.1:1. In the group of complicated cases, males showed a markedly greater frequency (7.7:1).

5. Metastasis-free cases of renal adenocarcinoma were more frequent in complicated cases with renal and liver and/or pancreas cystic disease than in those with renal cystic disease alone (Table 2). There were three cases of renal adenocarcinoma with cystic disease in all three organs (kidney, liver and pancreas) which had no metastasis and were over 80 years of age (Table 2). There was no significant difference between males and females in incidence of metastasis-free cases.

Table 2 Frequencies of renal adenocarcinoma complicated by cystic disease of the kidney, liver and pancreas, and those without metastasis

Cystic disease	A: No. of cases	B: Metastasis-free cases (B/A%)
K	19 (73)	4 (21)
K+L	3 (12)	1 (33)
K+P	1 (4)	1 (100)
K+L+P	3 (12)	3 (100)
Total cases	26	9 (35)

K: kidney, L: liver, P: pancreas

6. No significant difference in the frequency at which various organs had metastatic involvement was noted between the group of 17 complicated cases with metastasis and that of 1,571 cases of the whole series of renal adenocarcinomas with metastasis (Table 3).

Table 3 Metastatic sites in renal adenocarcinoma cases and complicated cases

Metastatic sites	Whole series (%)	Complicated cases (%)
Lungs	1,188 (76)	11 (65)
Lymph nodes	1,001 (64)	12 (71)
Bones	669 (43)	5 (29)
Liver	639 (41)	3 (18)
Ipsilateral adrenal	300 (19)	2 (12)
Contralateral adrenal	181 (12)	1 (6)
Contralateral kidney	396 (25)	1 (6)
Pancreas	236 (15)	3 (18)
Heart	236 (15)	1 (6)
Brain	177 (11)	1 (6)
Spleen	83 (5)	0
Thyroid	80 (5)	2 (12)
Tumor thrombus	137 (9)	2 (12)
Total cases with metastasis	1,571	17

7. Seven cases had urothelial tumors of the renal pelvis as a complication; one of these cases had no metastasis (48 year-old male) (Table 1). There was one case complicated by Wilms' tumor (71 year-old male) and one by renal leiomyosarcoma (52 year-old male). Both had metastases of the tumors.

8. In addition to these 35 cases, there were three cases of renal adenocarcinoma complicated by cystic disease of the liver (with no metastasis in one case) and one case by cystic disease of the pancreas (with metastasis).

9. There were no cases complicated by renal neoplasms and cystic renal disease in cases with renal transplantation and hemodialysis (Table 4).

Table 4 Renal tumors in cases with renal transplantation and hemodialysis

Renal tumors	Transplantation (%)	Dialysis (%)
Cystic renal disease	3 (5)	16 (3)
Renal adenocarcinoma	0	3 (0.6)
Complicated cases	0	0
Total cases	57	538

DISCUSSION

The problems of malignant changes in cystic renal disease are of importance in determining the indications of nephrectomy in potential transplant recipients (2, 4, 5, 7, 8, 11, 12). In the present series of 3,133 autopsied cases of renal tumors, the incidence of complication by renal

malignant neoplasms and cystic renal disease was as low as 1.1% (35 cases). However, the occurrence of renal malignancies in cases of cystic renal disease over 10 years of age was by no means infrequent; 35/500 cases or 7%. Among cases over 60 years of age, the incidence of renal adenocarcinoma complicated by cystic renal disease was as high as 12.2% (24/196 cases) although cases indicated for renal transplantation were few in this age group. In contrast, cases between 10 and 59 years of age showed a lower incidence (11/304 cases or 3.6%).

The incidence of renal malignancies in patients with cystic renal disease in the present series was virtually consistent with a report of Walsh (1951) (15): 7% in 500 cases of renal cysts, although there was no further data analysis with repspect to age. According to Emmett (1963) (2), the coexistence of cystic renal disease and malignant tumors in the same kidney accounted for 1% of cases of renal tumors studied and for 2.3% of cystic renal disease cases. The percentage of such coexistence with involvement of the same kidney in the present series is unknown.

Metastasis-free cases of renal adenocarcinoma were more frequent in the complicated cases (34.6%) than in all cases of renal adenocarcinoma (251/1,828 cases or 14.1%). This finding indicates that the complicated cases cannot necessarily be said to be clinically more malignant than renal adenocarcinoma alone. Cases without metastasis died of causes other than cancer of the kidney. It was noteworthy that all three cases complicated by cystic disease of the kidney, liver and pancreas had no metastasis and were all over 80 years of age. In many cases the renal tumors were first discovered in the autopsy.

The analyses of the data from the present series of a relatively few autopsied cases do not permit any conclusion as to whether malignant changes are more liable to occur in patients with cystic renal disease on long-term hemodialysis or with renal transplantation. The complicated cases previously reported were almost all surgical cases, not autopsied cases. The reason for this might be either because the renal cyst had not yet undergone a malignant change or because the malignant neoplasms were of the slow progress type (13, 14) with a low liability to metastasis even if the malignant transformation had already taken place in the present series with a short survival time on hemodialysis or with renal transplantation.

The indications for nephrectomy in potential transplant recipients did not agree in the reports concerning the respective advantages and disadvantages (2, 4, 5, 7, 8, 11, 12). Prophylatic bilateral nephrectomy was advocated because of the risk of malignancies, but the disadvantages were anemia, hypotension and fluid intake restriction in such anephric patients.

In our cases, no information was available concerning differences in incidence of various types of cystic disease of the kidney and those in the complicated cases. Adult polycystic disease of the kidney is more likely in cases on hemodialysis due to cystic renal disease of the kidney. However, there were no cases complicated by renal neoplasms and cystic renal disease in cases with renal transplantation and hemodialysis in the present series.

Although it is not known if various cystic renal diseases undergo malignant changes, we do not think that all patients on hemodialysis should

be indicated for nephrectomy since patients with renal malignances are mostly elderly and are frequently free from metastasis.

There have been few cases of cystic renal disease complicated by renal pelvic tumor, Wilms' tumor or renal sarcoma reported in the literature (1, 5, 10), and there were only nine such cases in the present series.

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