Clinical and histopathological characteristics of renal carcinoma in patients under forty years of age

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**ABSTRACT**

**Objective:** To provide information on the clinical and histopathological characteristics of kidney tumors in patients under forty years of age and to compare them with other age groups.

**Methods:** Case records were reviewed of patients from two institutions operated on for kidney tumors over a period of seven years whose records were complete. A total of 34 patients were found and 5 of them were under forty years of age. Their clinical and histopathological characteristics were compared.

**Results:** In the Group 1 patients (those under forty years of age), 4 presented with conventional renal cell carcinoma and 1 presented with leiomyosarcoma. There were 29 patients in Group 2, and 23 presented with clear cell carcinoma, 1 with papillary carcinoma, 1 with chromophobe carcinoma, 2 with transitional cell carcinoma of the renal pelvis, 1 with leiomyosarcoma, and 1 with oncocytoma with microscopic focus of renal cell carcinoma. With the exception of the leiomyosarcoma patient, Group 1 patients have survived from 51-72 months with no tumor activity in spite of tumor anatomopathological characteristics.

**Conclusions:** Despite the small number of patients in the present study, the authors find patient survival rate striking given that other studies refer to the usually aggressive biological behavior of this pathology.

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**RESUMEN**

**Objetivo:** Conocer las características clínicas e histopatológicas de las neoplasias renales en pacientes menores de cuarenta años y compararlas con otros grupos de edad.

**Métodos:** Se revisaron los expedientes de los pacientes intervenidos de neoplasias renales, quienes tenían expediente completo en dos instituciones en el lapso de siete años. Se encontraron 34 pacientes, cinco de los cuales fueron menores de cuarenta años. Se compararon 34 pacientes, cinco de los cuales fueron menores de cuarenta años. Se compararon sus características clínicas e histopatológicas.

**Resultados:** De los pacientes menores de 40 años, cuatro presentaron carcinoma de células renales convencional mientras que otra paciente presentó un leiomiomasarcoma. Los pacientes del grupo 2 fueron 29 pacientes de los que 23 presentaron carcinoma de células claras, un carcinoma papilar, un cromófobo, dos carcinomas de células transicionales de la pelvis renal, un leiomiomasarcoma y un oncocitoma con foco microscópico de carcinoma de células renales. Los pacientes del grupo 1, excluyendo a la paciente del leiomiomasarcoma, tienen sobrevidas entre 51 y 72 meses, sin actividad tumoral a pesar de las características anatomopatológicas de las neoplasias.

**Conclusiones:** Consideramos que a pesar de ser un pequeño grupo de pacientes, nos ha llamado la atención la sobrevida en estos pacientes en quienes en diferentes
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Key words: Renal carcinoma, age, Mexico.

INTRODUCTION

Renal carcinoma makes up about 3% of malignant tumors. They are more frequent in men with a 3:2 ratio and they are the most lethal of the urogenital tumors, representing approximately 40% of them. Of the total of kidney tumors reported in different series, around 3-8% have been diagnosed in patients under forty years of age. Known prognostic factors are clinical stage, cell grade, and histological type. Some authors have pointed out that lymphatic disease and metastasis have been found in young adult patients, implying a more aggressive biological behavior for patients in that age category. The frequency of incidental diagnosis in younger patients has increased due to routine use of ultrasonography, making it feasible to diagnose these patients in early clinical stage of disease, thus improving survival possibilities.

METHODS

Case records of patients that underwent surgery for malignant kidney tumors during the time frame of September 2002 to March 2009 at two institutions were reviewed. Patients were excluded from the study if case records were incomplete or if follow-up had not been possible. Thirty-four patients fit inclusion criteria and 5 of them were under 40 years of age at the time of diagnosis. Those 5 patients made up Group 1 and the remaining 29 patients made up Group 2. The two groups were compared taking into account histobiological disease behavior in young adult patients (Table 1).

RESULTS

The five patients in Group 1 are described below:

Case 1. Patient is a 38-year-old woman who sought medical attention due to the presence of an abdominal mass in October 2003. She complained of pain and 8 kg weight loss in the past 6 months. She was studied and a large mass dependent on the left kidney was detected (Figure 1). Radical nephrectomy was carried out and histopathological study reported high grade renal leiomyosarcoma in the lower pole measuring 8 cm x 7 cm x 7 cm and 13 negative lymph nodes. Patient was referred to the oncology department where she underwent chemotherapy and radiotherapy despite which she presented with pulmonary and hepatic metastases 13 months after procedure. Patient died 18 months after surgery.

Case 2. Patient is a 38-year-old man, taxi driver, non-smoker, seen for the first time in November 2003 for silent hematuria. Emergency room ultrasound (US) detected right kidney tumor. This finding was

Table 1. Characteristics of the two study groups.

<table>
<thead>
<tr>
<th>Clinicopathological characteristics</th>
<th>Group 1</th>
<th>Group 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patients</td>
<td>5 (14%)</td>
<td>29 (86%)</td>
</tr>
<tr>
<td>Age (mean and range)</td>
<td>36.2 (28-40)</td>
<td>53 (41-81)</td>
</tr>
<tr>
<td>Conventional RCC</td>
<td>4</td>
<td>23</td>
</tr>
<tr>
<td>Chromophobe RCC</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Papillary RCC</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Transitional cell carcinoma</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Leiomyosarcoma</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Oncocytoma and RCC</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Sex M:F</td>
<td>2:3</td>
<td>19:10</td>
</tr>
<tr>
<td>Stage T1</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Stage T2</td>
<td>1</td>
<td>18</td>
</tr>
<tr>
<td>Stage T3</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>Stage T4</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Fuhrman I and II</td>
<td>3</td>
<td>19</td>
</tr>
<tr>
<td>Fuhrman III and IV</td>
<td>1</td>
<td>6</td>
</tr>
</tbody>
</table>
corroborated by computed tomography (CT) and patient underwent radical nephrectomy December 3, 2003. Histopathological report stated stage T2b, Fuhrman grade II conventional renal cell carcinoma measuring 7 cm x 5 cm x 4 cm (Figure 2). Patient continues to be under surveillance with no tumor activity data. His most recent clinical evaluation was in February 2009.

Case 3. Patient is a 28-year-old woman evaluated for pain in the right hypochondrium. US revealed exophytic tumor in lower pole of the right kidney that was corroborated by CT (Figure 3). On April 24, 2005, patient underwent partial nephrectomy through right lumbotomy, taking care not to injure renal pedicle, plus hypothermia, with previous double-J catheter placement. Histopathological report was stage T1, Fuhrman Grade I conventional renal cell carcinoma measuring 3.5 cm x 3 cm x 2.5 cm with disease-free margins. Patient is still having follow-up based on CT every three months and chest X-ray every 6 months during first two years and then annually with no evidence of local or distant recurrence up to last appointment in July 2009.

Case 4. Patient is 37-year-old woman with morbid obesity weighing 109 kg and history of silent hematuria for two years that was previously intermittent. Kidney US revealed left kidney tumor that was then confirmed by CT. Patient underwent radical nephrectomy on June 16, 2005. Histopathological study reported stage T1b, Fuhrman Grade II renal cell carcinoma measuring 6 cm x 4 cm x 3 cm (Figure 4). Patient continues to be under surveillance with no evidence of tumor activity up to the present date.
Case 5. Patient is 40-year-old man who sought medical attention in July 2005 presenting with abdominal tumor, pain, and hematuria. He had clinical history of dyslipidemia and difficult-to-control high blood pressure. CT showed a large mass dependent on the right kidney (Figure 5). Patient underwent arteriography with selective embolization (Figure 6) one day prior to radical nephrectomy (28-07-05). Histopathological result was renal cell carcinoma measuring 17 cm x 16 cm x 13 cm, with extension to perirenal adipose tissue. Fuhman Grade III tumor was less than 1 cm from surgical margin with tumor emboli in renal vein, recent intratumoral thrombosis and of strange material with recent tumor necrosis and hemorrhage (Figure 7). It was classified as stage T3b. Patient was evaluated in June 2009 with abdominal CT and chest X-ray showing no evidence of tumor activity.

Group 2 was made up of 29 patients. Twenty-three of them presented with convention renal cell carcinoma or clear cell carcinoma and the rest included 1 patient with
chromophobe carcinoma, 1 with papillary carcinoma, 2 with transitional cell carcinoma of the renal pelvis, 1 with leiomyosarcoma and 1 with oncocytoma that was included because it had a microscopic focus of renal cell carcinoma. Age ranged from 41-81 years with a mean of 53 years. Patients included 19 men and 10 women. Fifteen of the patients were smokers. Of the 25 patients presenting with renal cell carcinoma of this group, 18 had stage T2 disease with tumors from 7-15 cm. Six patients had stage T3 disease with tumors from 12-19 cm, one of which was bilateral with past medical history of hemangioblastoma of the central nervous system (CNS) and probable Hippel-Landau syndrome who refused left kidney surgery. One patient had 22 cm, stage T4, Fuhrman Grade IV tumor extending to Gerota's fascia.

The only mortality in Group 1 was the leiomyosarcoma patient in whom pulmonary and hepatic metastases were detected 13 months after surgery and who died 5 months later. Eight patients in Group 2 died: the patient with oncocytoma died from pancreatic tumor 23 months after nephrectomy. The patient with leiomyosarcoma died from tumor activity 12 months after procedure. The remaining 6 patients with conventional renal cell carcinoma died from tumor activity. The patient with bilateral involvement (Figure 8) was operated on only on the right side with stage T3a, Fuhrman Grade II tumor. In addition this patient developed renal insufficiency one year after procedure and died after fourteen months. The remaining 5 patients died within a time frame of 8-36 months with a mean 16 months. Tumor characteristics were: 4 in stage T3b and 1 in stage T4a. Of the stage T3b tumor patients, 1 had stage N2 positive lymph nodes as did the patient with stage T4 tumor. The two patients with transitional cell tumors of the renal pelvis were treated with nephroureterectomy. Both tumors were stage T1a and histologically one was low-grade and the other was high-grade. They were managed with adjuvant chemotherapy and both patients remain asymptomatic at follow-up of 32 and 43 months, respectively.

**CONCLUSIONS**

The low incidence of this pathology in young adult patients makes it difficult to understand its natural evolution in this age group. Despite the small number of patients in the present report, the authors feel the percentage of patients under forty years of age is high (14%) compared with that shown in previous studies such as those of Kantor and Lieber that have an incidence around 3.5% and in others such as that of Gómez, that reported 8.7%. This is perhaps due to follow-up desertion in patients over forty years of age, whereas the patients in the present study have had very close follow-up. It is striking that only the patient that underwent partial surgery could be considered an incidental case, given that the rest of patients had symptomatology that served as a guide for their evaluation. It is well-known that mesenchymatous tumors have poor and short-term prognosis despite surgery and adjuvant treatments. And it is to be expected that patients in whom tumors are detected in the early stages would be found with low stage and low nuclear grade tumors, improving their prognoses. But in the present series a Group 1 patient presented with a large, advanced stage, high differentiation grade tumor who has had free-from-tumor-activity survival for more than 4 years. Some authors have found survival differences in young adult patients that they attribute to lymphatic involvement that has not been found in the patients in the present series. In contrast to Renshaw’s findings in which his young patients had more undifferentiated tumors, only one patient in the present study had advanced clinical stage tumor with high Fuhrman grade. The authors believe that the patients under 40 years of age whom they have treated have had biological behavior similar to that of older patients and that in the future, through increased massive use of imaging studies, this type of tumor will be incidentally detected more frequently in younger patients, allowing for nephron-sparing surgery to be carried out. This surgery has been shown to offer survival results similar to those of radical surgery in selected cases.

**BIBLIOGRAPHY**