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Splenic and Pulmonary Metastases from Renal Cell Carcinoma: Report of a Case

MASAYUKI TATSUTA[1], KEN SHIOZAKI[1], SEIZO MASUTANI[1], KAZUHIKO HASHIMOTO[1], HIROSHI IMAMURA[1], MASATAKA IKEDA[1], AKIHIRO MIYA[1], HIDEYUKI ISHIDA[1], TAKATOSHI KAWASAKI[1], HIROSHI FURUKAWA[1], TAKASHI SATOMI[1], and YOSHIHIKO HOSHIDA[2]

Departments of [1] Surgery and [2] Pathology, Sakai Municipal Hospital, 1-1-1 Minamiyasui-cho, Sakai, Osaka 590-0064, Japan

Abstract We report herein the case of a patient in whom pulmonary and splenic metastases from renal cell carcinoma (RCC) were successfully treated by surgical excision. A 69-year-old man who underwent left nephrectomy for RCC 17 months before was suspected to have a pulmonary metastasis based on computed tomography (CT) findings. Partial resection of the left lower lobe was performed with thoracoscopic assistance. However, 4 months later, a splenic tumor, 6 cm in diameter, was detected by CT and ultrasonography, and a splenectomy was performed. Histologically, both resected specimens were diagnosed as metastasis from RCC. A second pulmonary metastasis of the left upper lobe was resected 4 years 8 months later. The patient was in good health when last seen 11 months after his last operation. Malignant neoplasms rarely metastasize to the spleen and most cases are found at autopsy, or feature multiple distant metastases. Only four other cases of splenic metastases from RCC have been reported. The prognosis associated with splenic metastasis is favorable when only a solitary lesion exists.

Key words Splenic metastasis · Pulmonary metastasis · Renal cell carcinoma

Introduction

The most common sites of metastasis of renal cell carcinoma (RCC) are the lungs, bone, liver, lymph nodes, adrenal glands, and brain. Splenic metastases from various neoplasms are rare and almost always found with other distant metastases or at autopsy.[1] This report describes the successful surgical treatment of a solitary splenic metastasis from renal cell carcinoma (RCC) which developed after resection of a pulmonary metastasis. Only four other cases of splenic metastasis from RCC have been documented, and to the best of our knowledge, this is the first report describing the successful resection of metastasis to the lung and spleen.

Reprint requests to: M. Tatsuta
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Case Report

A 69-year-old man was admitted to our hospital in July 1994 for investigation and treatment of a large mass in the spleen. In September 1992, he had undergone a left nephrectomy for RCC of clear cell alveolar type, G1, pT2, pV0, pN0, stage II. A follow-up chest computed tomography (CT) scan done in February 1994 revealed a mass, 2×1 cm in size in the lower lobe of the left lung (S8), but no other abnormal findings. Thus, a partial pulmonary resection of the left lower lobe was performed by video-assisted thoracic surgery, and a diagnosis of metastatic RCC was made. An abdominal CT scan and an echogram done 4 months later demonstrated a space-occupying lesion, 6×6 cm in size, in the spleen which had not been detected at the time of pulmonary resection (Fig. 1). The patient had no complaints and all laboratory results were within the normal range. There were no signs of recurrence in any other location, including both lungs.

Intraoperatively, the spleen was tightly adherent to the surrounding tissue, but the splenic capsule was intact. There was no peritoneal dissemination. The lymph nodes of the splenic hilum were not swollen, and no liver metastasis was found. A splenectomy was performed and the resected spleen weighed 250 g. The cut surface revealed a milky-white tumor, 5.8×6.2 cm in size, in the upper half of the spleen. The elastic-soft tumor did not invade the capsule (Fig. 2). A histopathological diagnosis of a metastasis from RCC was comfirmed (Fig. 3). In November 1995, a new lesion, 1 cm in diameter, was detected by a follow-up chest CT

scan, and pulmonary metastasis was suspected. The nodule was slow-growing, and found to be 1.5 cm in diameter in February 1999. As there were no other abnormal findings, a second partial pulmonary resection of the left upper lobe was performed in March 1999. The postoperative course was uneventful, and no evidence of any further recurrence has been seen in the 11 months since this last operation.

Discussion

About 30% of patients with RCC already have distant metastases at the time of diagnosis, and recurrence is subsequently found in 60% of the remaining patients. Chemotherapy is efficacious for only about 10% of patients, and interferon therapy has not proven to be very effective either (16.3%–17.7%).[1] The lung is the most common site of metastasis from RCC, and the prognosis of these patients is comparatively unfavorable due to the likelihood of other distant metastases; however, pulmonary resection is warranted in selected cases.[2,3] The factors favoring a better prognosis for the surgical treatment of metastatic RCC are a long disease-free interval, low tumor aggressiveness, and complete resection.[4,5]

The reasons for the rarity of splenic metastasis have been postulated for some time.[6] Anatomically, the sharp angle of where the splenic artery branches from the celiac artery and the scarcity of afferent lymphatic vessels limits tumor metastasis, while the physiological actions of the spleen, including the rhythmic contraction, phagocytosis, and immunological antineoplastic action, may also inhibit metastasis.

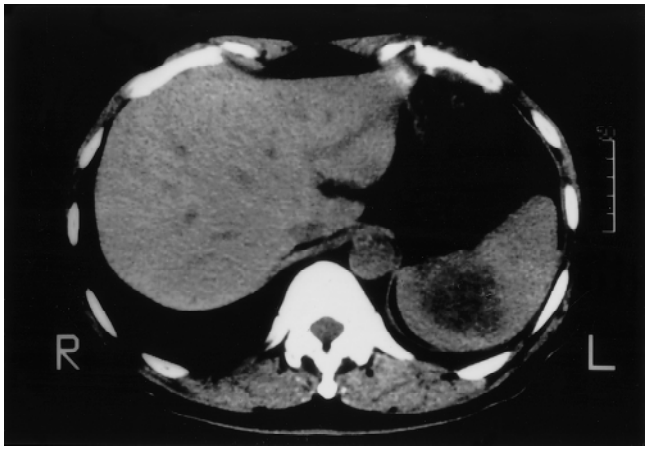


Fig. 1. Abdominal computed tomography scan demonstrated a space-occupying lesion, 6 × 6 cm in size, in the spleen

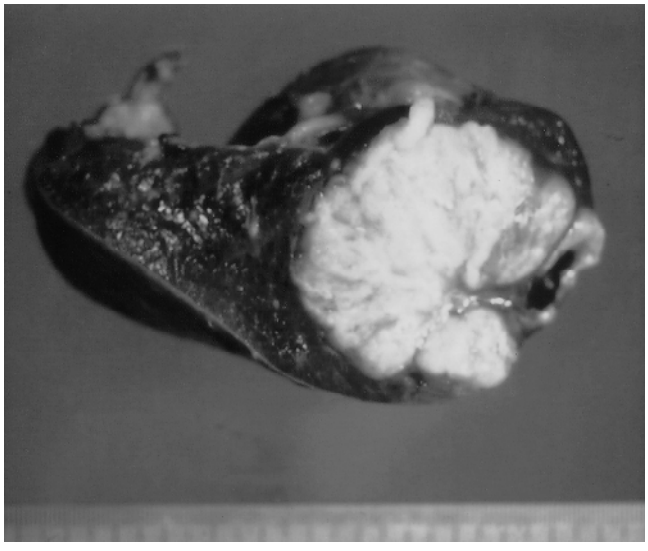
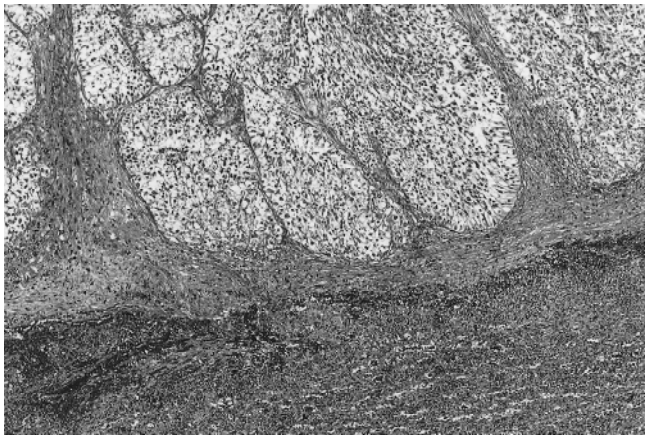
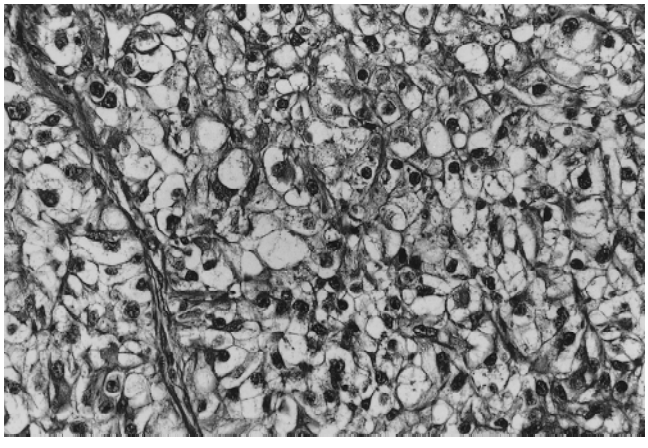


Fig. 2. Cut surface of surgical specimen showing a tumor in the upper half of the spleen, 6 cm in diameter, that did not invade the capsule



a



b

Fig. 3a,b. Microscopic examination revealed clear cell carcinoma in the spleen (H&E: a, ×15; b, ×75)

Table 1. Cases of surgical resection of splenic metastasis from renal cell carcinoma

Case no.	First author[Ref.]	Age/ sex	Primary (kidney)	Stage	DFI	Tumor size (spleen)	Prognosis
1	Strum[7]	55/M	Right	Unknown	22 Y	Splenomegaly	6 months, died
2	Murao[8]	72/M	Left	I	10 Y	5 cm, 2 cm	1 year, alive
3	Pal[9]	54/F	Left	Unknown	Simultaneous	Small nodule	Unknown
4	Suzuki[10]	43/M	Left	I (T1N0M0)	7 Y	5 cm	9 years, alive
5	Present case	69/M	Left	II (T2aN0M0)	1 Y10 M	6 cm	5 years 7 months, alive

In the past 10 years, 50 surgical cases of splenic metastasis have been reported in Japan. The primary sites were as follows: the colo-rectum in 26 cases, the stomach in 8, the ovary in 6, the lung, liver, and pancreas in 2 each, and the kidney, bladder, testis, and parotid grand in 1 each. There were 21 patients with synchronous disease and 29 with metachronous disease, 6 and 4 of whom, respectively, died within 1 year. The disease-free intervals of all the patients with metachronous disease were less than 1 year.

Splenic metastasis from RCC is extremely rare. In fact, of 6451 autopsy cases of RCC reported in the Annual of the Pathological Autopsy Cases in Japan between 1981 and 1996, only 166 (2.57%) cases of splenic metastases were found. A total of only five surgical cases of splenectomy have been reported including the present case[7–10] (Table 1). The disease-free interval in three of these patients (1, 2, 4) were very long, two (4, 5) surviving for more than 5 years. The surgical indications should be strictly selected, and the malignant potential of these RCCs is probably low.

The prognosis of our patients was not clearly predictable, because the splenic metastasis was considered to grow rapidly and a pulmonary metastasis had been excised 5 months previously. However, a single metastasis was detected only in the spleen and complete resection was considered possible. Moreover, the patient's general condition was good and no other treatment such as chemotherapy or interferon would have been effective. Splenectomy was therefore performed with a satisfactory result.

We believe that the route of metastasis of RCC to the spleen may have been hematogenous for the following reasons: the splenic capsule was intact; no cancerous invasion or lymph node metastasis of the splenic hilum was detected intraoperatively; and pulmonary metastases were removed before and after the splenectomy. At the time of splenectomy, one pulmonary metastasis had already been resected and no other lesion was detected, but after the splenectomy a second slow-growing pulmonary metastasis was found and resected. Although the patient is in good health more than 5 years after the splenectomy with no evidence of further recurrence, careful follow-up will be required.

In conclusion, we believe that splenectomy is justified for splenic metastasis from RCC if it is solitary.

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