Case Report
Renal cell carcinoma metastatic to the nasal cavity

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Received February 12, 2012; Accepted June 9, 2012; Epub July 12, 2012; Published August 15, 2012

Abstract: Metastatic renal cell carcinoma of the nasal cavity is very rare. A 76-year-old man presented with epistaxis and admitted to our hospital. His past histories were right radical nephrectomy for renal cell carcinomas at the age of 68 years and brain infarction at the age of 75 years. Laryngoscopic examination revealed a red polyp of the right nasal cavity. Imaging modalities including CT and MRI also revealed a tumor measuring 2 x 3 x 2 cm. Angiography showed that the tumor is very hypervascular. Clinical diagnosis was angiogenic tumors including hemangioma, sinonasal hemangiopericytoma, and paraganglioma. A blood data showed anemia and low platelets, and bone marrow biopsy revealed myelodysplastic syndrome. A coiling embolization of the feeding artery was performed, and the tumor reduced markedly. The tumor was resected almost entirely. Pathologically, the tumor was 2 x 1.5 x 1.5 cm red tumor. The tumor cells had clear cytoplasm, and arranged in a trabecular pattern lined by a layer of endothelial cells. Atypia is mild. Immunohistochemically, the tumor cells were positive for pancytokeratin (AE1/3, CAM5.2), RCC ma, CD10, and Ki-67 (labeling=20%), but negative for CD34, factor-VIII-related antigen, CEA, EMA, melanosome (HMB45), S100 protein, p53, and HepPar-1. The pathological diagnosis was made without knowledge of kidney status. A pathological diagnosis of metastatic renal cell carcinoma of clear cell type (grade 1) was made. The patient is now free from tumor, and palliative chemoradiation is considered.

Keywords: Nasal cavity, metastatic renal cell carcinoma, histopathology

Introduction

Patients with renal cell carcinoma (RCC) develop metastasis in approximately 30% of cases [1]. Common sites of metastasis of RCC are lungs, liver, bone, brain, and adrenal glands, but RCC can metastasize to any organs [1]. Metastatic RCC of the nasal cavity was very rare, and only several cases are reported as case reports [2-8]. Comprehensive studies of case series of nasal metastatic RCC have not been performed.

Metastases of RCC may be found at diagnosis or at some interval after nephrectomy [1]. About 20-50% of patients with RCC will eventually develop metastasis after nephrectomy [1]. The prognosis of patients with metastatic RCC is worse. We herein report the case of a 76 patient who underwent nephrectomy for RCC 8 years before, and developed a metastasis of the right nasal cavity.

Case report

A 76-year-old Japanese man was admitted to our hospital because of continuous epistaxis. His past history was right radical nephrectomy for RCC at the age of 68 years (8 years ago) at a other hospital, and brain infarction at the age of 75 years (1 year ago) at our hospital. Laryngoscopic examination identified a red polypoid mass of the right nasal cavity (Figure 1A). Imaging modalities including CT and MRI also revealed a tumor measuring 2 x 3 x 2 cm (Figure 1B). Angiography showed that the tumor is very hypervascular (Figure 1C). Angiogenic tumors including hemangioma, sinonasal hemangiopericytoma, and paraganglioma were clinically suspected. A blood data showed anemia and thrombocytopenia (red blood cells 188 x 10^6/ml, normal 450-550; hemoglobin 5.5 g/dl, normal 14-17; and platelets 0.8 x 10^6/ml, normal 15-35), and bone marrow biopsy revealed myelodysplastic syndrome. A blood test also revealed renal dys-
function (BUN 74 mg/dl, normal 8-20; creatinine 5.1 mg/dl, normal 0.4 x 1.2). Imaging modality showed left hydronephrosis, and this renal dysfunction was thought due to chronic pyelonephritis of the left kidney. A coiling embolization of the feeding artery of the tumor was performed (Figure 1D), and the tumor reduced remarkably. The tumor could be resected almost completely.

Pathologically, the tumor was 2 x 1.5 x 1.5 cm red tumor. Because no description of previous RCC operation was written in the clinical findings, the pathological diagnosis was difficult. The clinical diagnosis was angiogenic tumors including hemangioma, sinonasal hemangiopericytoma, and paraganglioma. The tumor cells had very clear cytoplasm (Figure 2A), and arranged in a trabecular pattern lined by a layer of endothelial cells (Figure 2B). Numerous blood sinusoids were recognized (Figure 1A and 1B). Cellular atypia was not severe (Figure 2B). No mitotic and apoptotic bodies were seen. On the HE section, the pathologist was strongly suspicious of metastatic RCC. Differential diagnoses included hepatocellular carcinoma, clear cell sarcoma, hemangiopericytoma, and malignant melanoma. An immunohistochemical study was performed with the use of Dako Envision method (Dako Corp, Glostrup, Denmark) as previously described [9, 10]. Immunohistochemically, the tumor cells were positive for pancytokeratin (AE1/3, CAM5.2) (Figure 2C), CD10 (Figure 2D), RCC ma, and Ki-67 (labeling=20%) (Figure 2E). However, they were negative for CD34, factor-VIII-related antigen, CEA, EMA, melanosome, S100 protein, p53, and HepPar-1. CD34 immunohistochemistry highlighted the trabecular nature of tumor cells and numerous sinusoids (Figure 2F). A pathological diagnosis of metastatic RCC of clear cell type (grade 1) was made. The pathologist asked the clinician whether the patient had renal tumor, and at first he was aware of the presence of previous operation of RCC 8 years ago which was done at another hospital. Postoperative imaging modalities including CT and MRI showed no tumors. The patient is now free from tumor, and palliative chemoradiation is considered.

Discussion

The pathological diagnosis of the present patient was relatively difficult because the pathologist did not know the past history of nephrectomy for RCC. However, the characteristic clear cell RCC features were seen in HE section. Immunohistochemically, the tumor cells were positive for cytokeratins, indicating epithelial nature of the tumor. Although p53 was negative, Ki-67 labeling was relatively high, indicating malignant nature of the tumor cells. The RCC ma and CD10 positivity was indicative of metastatic RCC [11]. Melanoma was denied because the tumor cells were negative for S100 protein and melanosome (HMB45). The tumor is not hepatocellular carcinoma, which also...
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Figure 2. Pathological findings. A. Low power view of the nasal tumor. The tumor is medullary and composed of clear cells arranged in a trabecular pattern. HE: x 40. B. High power view of the nasal tumor. The tumor cells have clear cytoplasm. The nuclear atypia is mild. The blood sinuloids of the trabecular pattern is recognized. HE: x200. C. The tumor cells are positive for pan-cytokeratin.CAM5.2. Immunostaining: x200. D. The tumor cells are positive for CD10. Immunostaining: x200. E. The Ki-67 labeling of tumor cells are about 20%. Immunostaining: x200. F. CD34 (endothelial marker) highlight the trabecular pattern and numerous blood sinuloids. Immunostaining: x200.

shows a trabecular pattern, because of HE histology and negative HepPar1 which is a marker of hepatocellular carcinoma. Vascular tumors were also denied because the tumor cells are positive for cytokeratin and negative for CD34 and factor VIII-related antigen. Clear cell adenocarcinoma of various organs were denied by positive CD10 and negative CEA.

In the present patient, the tumor was very hypervascular in angiography. This hypervascularity was morphologically explained by the presence of numerous blood sinuloids in the tumors. The coil embolization was successful; it markedly reduced the nasal polyp. This seems to due to the presence of numerous blood sinuloids. In addition, the procedure made it possible that the tumor was almost completely resected due to the shrinkage of the tumor. Thus, in a relatively small metastatic RCC, the coil embolization followed by tumorectomy was very useful.

In the present case, the interval of nephrectomy for RCC and emergence of nasal metastasis was as long as 8 years. This 8 years’ duration is long, while a 17 years interval between nephrectomy and nasal cavity metastasis has been reported [8]. In general, 30% of RCC develop metastasis after nephrectomy [1]. In general, metastasis after nephrectomy occurs within 5 years [12]. The development of metastasis depends on many factors. In the present study, the RCC is clear cell RCC and Fuhrman’s nuclear grade was grade I. This type of RCC shows lower possibility of metastasis [13]; however the present patient showed nasal metastasis 8 years after the nephrectomy. These findings indicate that long term follow-up is needed in patients with RCC.

The prognosis of patients with metastatic RCC is worse. The survival ranged from 10.2 months to 22 months [14, 15]. In our case also, the prognosis appears worse. In our case, the patient had brain infarction, right hydronephro-
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sis, and myelodysplastic syndrome, in addition to metastatic RCC. These diseases seem coincidental.

In summary, we reported a case of metastatic RCC of the right nasal cavity. The pathological diagnosis was correctly made without knowledge of the status of the kidney. The coiling embolization was very effective, and this procedure reduced the tumor size remarkably and made it possible that the tumor was almost completely resected. The hypervascularity was histologically due to numerous blood sinuosids. The interval between nephrectomy and nasal cavity metastasis was as long as 8 years.

Conflict of interest statement

The authors have no conflict of interest.

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