Abstract

A 54-year-old woman presented with blepharoptosis, numbness in the lower lip, dysgeusia and pain in the extremities and back. MRI showed marked meningeal thickening and multiple bone lesions accompanying a prominent enhancing effect. CT scan of the chest and abdomen appeared to be unremarkable for primary cancer. She died 3 months after the admission, and postmortem autopsy showed a mass of about 2.5 cm in diameter in the renal medulla. Histological examination including immunohistochemistry confirmed the presence of a collecting duct carcinoma (CDC). This case is of particular interest because it emphasizes the possible fulminate clinical course of a small CDC.

Key words: collecting duct carcinoma, bone metastasis, meningeal carcinomatosis

Introduction

Collecting duct carcinoma (CDC) is a rare (<1%) renal malignancy and, unlike most renal carcinomas, it derives from the epithelial cells in the distal collecting ducts (1-3). CDC is known to be very aggressive and one-third of the patients have distant metastasis at diagnosis, and thus it is associated with an extremely poor prognosis (4). We herein report a case of CDC, which presented as meningeal carcinomatosis and multiple bone metastases and was diagnosed at the postmortem autopsy.

Case Report

A 54-year-old woman presented for right blepharoptosis, numbness in the lower lip, dysgeusia and pain of extremities and back continuing for 4 months. Neurological examination showed right II, V, XII cranial nerve pareses. Brain computed tomography (CT) scan showed multiple osteolytic lesions, and gadolinium-enhanced magnetic resonance imaging (MRI) showed marked meningeal thickening with enhancing effect (Fig. 1A, 1B), and multiple bone lesions accompanying the prominent enhancing effect (Fig. 1C, 1D). CT scan of the chest and abdomen appeared to be unremarkable for primary cancer, and only a large cyst of about 6 cm in diameter was observed in the right kidney. Blood examination showed marked elevation of alkaline phosphatase (1,055 IU/L) and calcium (11.2 mg/dL). Biopsy from the ilium suggested an epithelial malignancy because the carcinoma cells were positive for cytokeratin AE1/AE3, but negative for leukocyte antigen and CD79a; however, the primary site was unpredictable. Although mannitol, dexamethasone and morphine hydrochloride were administered intravenously, the patient’s neurological status continued to deteriorate with severe pain in various sites and continuous decrease in general responsiveness, and she did not wish to undergo further examination for diagnosis and treatment. Therefore, we missed the opportunity to consult other doctors including urologists. She died 3 months after admission, and postmortem autopsy was performed. Macroscopically, a whitish mass of about 2.5 cm in diameter in the right renal medulla, adjacent to a large cyst, was observed (Fig. 2A, arrow). Retrospectively, in the contrast-enhanced CT scan, a small low-density tumor of about 1.5 cm in diameter appeared to be depicted at the medulla pyramid of the right kidney, adjacent to a large cyst.
Figure 1. MRI findings of the brain and spine. MRI before (A, C) and after (B, D) the gadolinium infusion showed marked meningeal thickening with enhancing effect (B), and multiple bone lesions accompanying the prominent enhancing effect (D).

(Fig. 2B, arrowhead). The precise diagnosis was not performed at the presentation due to the presence of a large renal cyst. Histological examination demonstrated the presence of infiltrative irregular tubules embedded in fibro-inflammatory stroma (Fig. 3A). By immunohistochemistry, the tumor cells were positive for cytokeratins 7 (Fig. 3B) and 19 (Fig. 3C), and vimentin (Fig. 3D), thus the diagnosis of CDC was confirmed. Although craniotomy was not permitted, histological examination of the spinal cord demonstrated the meningeal carcinomatosis.

Discussion

CDC accounts for <1% of renal epithelial malignancies but it is recognized as a distinct entity in the WHO (2004) classification (1-3). The largest case series reported from Japan consisted of 81 patients, and 32% had distant metastasis at diagnosis, predominantly in lung (17%) and bone (16%); however, only 1 case had brain metastasis (4). Median patient age was 58.2 years, and males comprised 71.6% of the patient population. Tumor diameter was 1 to 15 cm (median 6), and urine cytology was negative in the majority of patients, although urine cytology was not performed in the present patient. Contrast enhancement on CT was low in the majority of cases (4). CDC is positive for keratins of low and high molecular weight and vimentin, as shown in the present case. Although radical nephrectomy and postoperative therapy were performed, most patients died within 1-3 years of diagnosis. Postoperative treatment included immunotherapy such as interferon-α, and chemotherapy such as gemcitabine combined with carboplatin, and sunitinib; however, most cases did not respond satisfactorily to these treatments (4-6).

Meningeal carcinomatosis occurs in 1-5% of patients with systemic cancer and is characterized by multifocal neurological signs and symptoms (7, 8). Useful tests in the diag-
Figure 2. Postmortem autopsy and CT findings of the kidney. A whitish mass of about 2.5 cm in diameter in the renal medulla, adjacent to a large cyst, was observed (A, arrow). A small low-density tumor of about 1.5 cm in diameter appeared to be depicted in the abdominal contrast-enhanced CT scan (B, arrowhead).

Figure 3. Histological findings of the renal tumor. Histological examination demonstrated the presence of infiltrative irregular tubules embedded in a fibro-inflammatory stroma (A). By immunohistochemistry, the tumor cells were positive for cytokeratins 7 (B) and 19 (C), and vimentin (D), which were diagnostic of CDC.

The diagnosis of meningeal carcinomatosis includes gadolinium-enhanced MRI of the brain and spine, the cerebrospinal fluid (CSF) examination and radioisotope CSF flow studies. MRI disclosed meningeal lesions in nearly 70% of patients (9). Although the presence of malignant cells in CSF is diagnostic of meningeal carcinomatosis, repeated examinations may be necessary to establish the diagnosis. The median survival time of untreated patients with meningeal carcinomatosis is 4-6 weeks; however, the combination of surgery, radiation and chemotherapy may slow the progression of neurological deterioration, and the median survival time can be increased to 4-6 months (7-10).

The present case is of particular interest because it emphasizes the possible fulminate clinical course of a small CDC, which might be difficult to identify.

References
