Gallbladder Metastasis from Renal Cell Carcinoma

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Abstract

We experienced a rare case of gallbladder metastasis from renal cell carcinoma. A 68-year-old man was admitted for further evaluation of a gallbladder tumor, which had been identified on follow-up computed tomography after partial nephrectomy for renal cell carcinoma. Enhanced computed tomography and magnetic resonance imaging showed an enhancing polypoid mass in the gallbladder lumen. Endoscopic ultrasonography demonstrated a homogenous hypo-echoic polypoid lesion, and the outer hyper-echoic layer of the adjacent wall was intact. Blood flow signals in the wall side of the mass were observed on color Doppler endoscopic ultrasonography images. Laparoscopic cholecystectomy was performed and he was uneventfully discharged. Macroscopic examination of the specimen revealed a $12 \times 7 \times 5$ mm pedunculated tumor attached by a thin pedicle to the fundus of the gallbladder. Histology confirmed a metastasis of the renal cell carcinoma that had infiltrated the shallow subserosa but had mainly grown into cavity of the gallbladder. These imaging findings are considered characteristic and may assist preoperative diagnosis in patients with a history of renal cell carcinoma.

Keywords Gallbladder metastasis · Renal cell carcinoma · Laparoscopic cholecystectomy · Clear cell renal cell carcinoma

Introduction

Renal cell carcinoma (RCC) has a great propensity to metastasize synchronously or metachronously to several anatomical sites. Gallbladder metastasis is extremely rare, being found in approximately 0.58% of cases at autopsy [1]. A review of the literature revealed only a small number of reports of gallbladder metastasis of RCC. We herein report a case of gallbladder metastasis from RCC treated with laparoscopic cholecystectomy.

Case Report

As a follow-up of right partial nephrectomy for clear cell RCC, stage T1aN0M0 stage I, 6 years ago, a 68-year-old man underwent a computed tomography (CT) scan that incidentally revealed a 1.0-cm-in-diameter mass in the gallbladder (Fig. 1a). CT scan performed 4 months ago showed no lesion in the gallbladder. Enhanced magnetic resonance imaging (MRI)

demonstrated a well-enhanced polypoid lesion in the gallbladder, which exhibited low signal intensity on T1-weighted imaging and slight high signal intensity on a T2-weighted imaging. Gallstones were not present. Endoscopic ultrasonography (EUS) showed a homogenous hypo-echoic polypoid lesion, and the outer hyper-echoic layer of the adjacent wall was intact (Fig. 1b). Blood flow signals in the wall side of the mass were observed on color Doppler EUS images. Blood biochemistry results were within normal ranges, including carcinoembryonic antigen (CEA) and carbohydrate antigen 19-9 (CA19-9). Based on these image findings and the patient's medical history, we initially thought the gallbladder mass metastasized from the RCC. The possibility that the tumor was primary cancer confined to the mucosa or muscular layer remained. The patient underwent laparoscopic cholecystectomy with full thickness dissection. The patient was uneventfully discharged on the third postoperative day. The cholecystectomy specimen had a $12 \times 7 \times 5$ mm, dark red polypoid mass with a thin stalk protruding into the lumen at the fundus of the gallbladder (Fig. 2a). Histological examination revealed clear cell carcinoma that had infiltrated the shallow subserosa in part of the stalk but had mainly developed under the mucosal epithelial layer of the gallbladder (Fig. 2b). The histopathological characteristics coincided with those of the renal cancer resected 6 years earlier. Four months after cholecystectomy, thoracic CT scan showed

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Fig. 1 **a** Contrast CT scan demonstrated a well-enhanced polypoid lesion in the gallbladder (arrow). **b** Endoscopic ultrasonography (EUS) showed homogenous hypo-echoic polypoid lesion and outer hyper-echoic layer of the adjacent wall was intact

multiple lung metastases and esophagogastroduodenoscopy showed a gastric metastasis. The patient has received treatment with sunitinib (37.5 mg daily) for 1 month to date.

Discussion

Clear cell RCC most commonly metastasizes hematogenously via the vena cava, although lymphatic metastasis may also occur. The most common target organs are lungs (75%), bone (20%), lymph nodes (11%), liver (18%), and brain (8%) [2]. The gallbladder is a rather unusual metastatic area for RCC. Neves et al. reviewed 52 cases of gallbladder metastasis from RCC. According to their report, the gallbladder lesions were persistently polypoid/pedunculated and intraluminal in 92% of cases, whereas primary gallbladder cancer has a diffuse wall thickening morphology [3]. There have been a few reports on EUS used to diagnose gallbladder metastasis of RCC.

Fig. 2 **a** The surgical specimen showed a dark red pedunculated tumor at the fundus of the gallbladder. **b** Microscopic examination of the tumor showed a pedunculated mass that had infiltrated the shallow subserosa in part of the stalk but had mainly developed under the mucosal epithelial layer of the gallbladder. Histological examination revealed clear cell carcinoma

Kurokami et al. reported that EUS revealed a low echoic polypoid mass with a high echoic layer, which was composed of erosion with exudate, on its surface [4]. In our case, we could not detect the high echoic layer of the surface, but EUS showed a homogenous hypo-echoic polypoid lesion, and demonstrated that the outer hyper-echoic layer of the adjacent wall, composed of deep subserosal layer and serosa, was intact. Color Doppler EUS images showed blood flow signals in the wall side of the mass. Enhanced CT revealed a strong enhanced lesion. These two image findings demonstrate the hyper-vascularity of metastasis from RCC, whereas primary gallbladder cancer does not present such a hyper-vascular pattern. Another peculiarity is represented by the fact that gallstones were present in only 15.6%, although primary cancer often coexists with gallstones [3]. We considered it as a metastatic gallbladder tumor of RCC and performed laparoscopic cholecystectomy. Neves et al. reported no patients with RCC who underwent simple cholecystectomy for metastatic

polypoid lesions developed through local recurrence, suggesting that simple cholecystectomy is adequate when metastasis of RCC is suspected [3]. Laparoscopic cholecystectomy for gallbladder metastasis remains controversial [3, 5], but laparoscopic surgery for malignant tumors is increasing recently. We removed the gallbladder without damaging the gallbladder wall during surgery and put the specimen in a bag and removed it from the abdominal cavity. We believe laparoscopic cholecystectomy for gallbladder metastasis to be feasible.

In conclusion, we reported a patient with gallbladder metastasis from RCC. Gallbladder metastasis from RCC should be considered in patients with hyper-vascular gallbladder polyps, absence of gallstones, and past history.

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Compliance with Ethical Standards This study has been approved by the research ethics committee of Ishikawa Prefectural Central Hospital.

The identity of the patients has been protected.

Written informed consent was obtained from the patient for publication of this case report and accompanying images.

Conflict of Interest The authors declare that they have no conflict of interest.

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