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### Oncology

# Gallbladder metastasis from renal cell carcinoma: A case report and literature review



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#### Introduction

Renal cell carcinoma has a propensity to metastasize to lung, bone, liver, brain, adrenal glands and the contralateral kidney. The proportion of metastatic RCC at diagnosis is estimated to be about 30–40%, and about 20–50% patients will develop metastasis after radical nephrectomy. Gallbladder metastasis from RCC is rare and is found in only about 0.6% of patients at autopsy. We present a case of metachronous metastasis of clear cell carcinoma to the gallbladder in a 55-year-old woman one year after radical nephrectomy.

## Case presentation

We present a case of metastasis of RCC to the gallbladder. A 55-year-old woman presented to a general practitioner for microhematuria pointed out at a medical checkup. Ultrasonography at the time showed a left-sided renal mass and gallbladder polyp. She was then referred to our hospital. Enhanced CT revealed an early enhancing tumor in the lower pole of the left kidney. The tumor was 82 mm in diameter, and there was no evidence of distant metastasis. Following consultation with a gastroenterologist, the gallbladder polyp was recommended to be followed as a benign lesion. We performed laparoscopic nephrectomy for the diagnosis of kidney cancer (cT2N0M0). Pathological results were clear cell RCC, pT3a, v1, ly0, G2. Routine examination by abdominal ultrasonography during follow-up showed the gallbladder polyp to be gradually increasing in size. It appeared as an isoechoic homogeneous mass with arterial flow in the neck of the gallbladder

(Fig. 1). Enhanced CT revealed an intraluminal early enhancing mass of 10 mm in diameter in the gallbladder (Fig. 2). Because we could not rule out a malignant tumor of the gallbladder, we performed a laparoscopic cholecystectomy 12 months after the nephrectomy. Macroscopically, the tumor excised from the gallbladder was a pedunculated polypoid mass. Histologically, the polypoid lesion was lined by biliary epithelium and contained clear cells entirely confined to the polyp without involvement of the muscular layer of the gallbladder (Fig. 3). Immunohistochemistry was positive for cytokeratin CAM 5.2, CD10, CD15 and vimentin. The histopathologic characteristics coincided with those of the renal tumor resected one year earlier. The gallbladder tumor proved to be a metastasis from the RCC. Follow-up observation is continuing after surgery, and no recurrence has been recognized at 9 months after the cholecystectomy.

## Discussion

Clear cell RCC most commonly metastasizes to the lungs (75%), bones (20%), liver (18%), lymph nodes (11%), and brain (8%). Gallbladder metastasis from RCC is extremely rare, being found in only about 0.6% of cases at autopsy. Metastatic gallbladder tumors are usually derived from melanoma, stomach, pancreas, ovary, small bowel, biliary duct and breast carcinomas.

Ultrasonography is suitable for the initial diagnosis of gallbladder tumor. It is sometimes difficult to distinguish between a metastatic lesion and the primary tumor. The metastatic tumor can be accompanied by a hyperechoic band on the tumor surface, whereas a primary tumor

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**Fig. 1.** Ultrasonography with color-doppler signal showed an isoechoic 10-mm mass in the neck of the gallbladder.

often bulges into the gallbladder lumen, being wide-based at the wall, hypoechoic, and with an inhomogeneous echoic pattern. Enhanced CT examination shows a difference in the contrast pattern. Metastasis from RCC is hypervascular with early wash-in and wash-out, whereas primary gallbladder cancer does not present a hypervascular pattern. In this patient, ultrasonography showed an increasingly enlarging gallbladder tumor, and enhanced CT revealed a hypervascular intraluminal tumor of the gallbladder that was not detectable on plain CT. From this point of view, it is important to follow up patients by combining imaging tests of various modalities after surgery for the primary tumor.

It is well-known that metastasectomy is expected to improve survival in carefully selected patients with metastatic RCC. Gallbladder metastasis is not necessarily a poor prognosis, especially when there is only a single metastasis. Cholecystectomy should be considered as a treatment to prolong patient survival. A review from Taiwan in 2017 by

Shyr et al. showed that the median survival time of the patients undergoing cholecystectomy for gallbladder metastasis from RCC was 26.5 months, with 1-year survival of 91.5% and 5-year survival of 59.3%. Although a solitary site of the metastasis is a favorable feature for survival, Chung et al. showed that only 39% of 33 patients had a single lesion as the metastatic site in the gallbladder. Meanwhile Shyr et al. showed in their review that the majority of patients (72%) had a solitary gallbladder metastasis without other sites of metastasis at the time of diagnosis. Thus, it cannot be stated unconditionally that a single metastasis in the gallbladder is common or not. Castro Ruiz et al. also reported that cholecystectomy with R0 resection was shown to be the only factor that increases survival. Surgical treatment should be considered a positive form of treatment when the metastatic lesion is solitary and resectable.

As to the timing of gallbladder metastasis, metachronous metastasis was reported in the majority of cases (75%).<sup>2</sup> There are some cases of gallbladder metastasis occurring more than 10 years after nephrectomy.<sup>5</sup> In our case, the gallbladder polyps noted at the time of diagnosis of the kidney cancer eventually became synchronous metastases. It is also possible that metastasis is not recognized at the diagnosis of primary tumor as in our patient. Some cases were identified as metastasis from RCC at histological examination only after cholecystectomy was performed for biliary symptoms such as biliary calculi or acute cholecystitis. Among the cases of gallbladder metastasis, acute cholecystitis as a clinical presentation is thought to be associated with a poor prognosis. In our patient, we could not diagnose the gallbladder tumor as a metastatic lesion prior to surgery, but it should have been evaluated so that it could be excised before it progressed.

#### Conclusion

The incidence of gallbladder metastasis from RCC is low, but its early resection is expected to improve patient prognosis. It is important

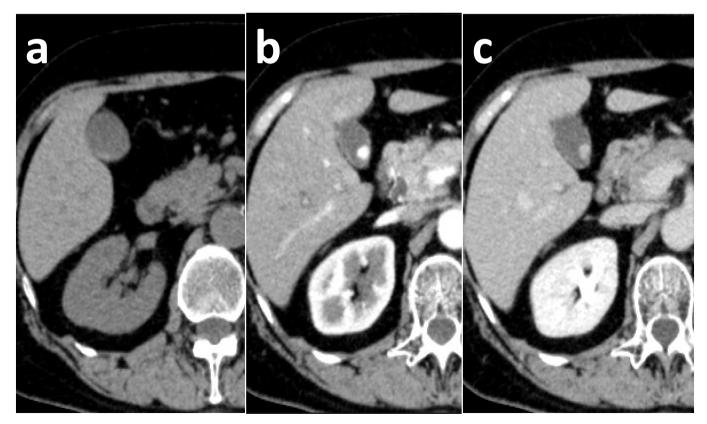


Fig. 2. Enhanced CT revealed an intraluminal mass in the gallbladder. The mass could not be detected in the plain CT images (a). However, the tumor was enhanced in the early phase (b) and washed out in the venous phase (c).

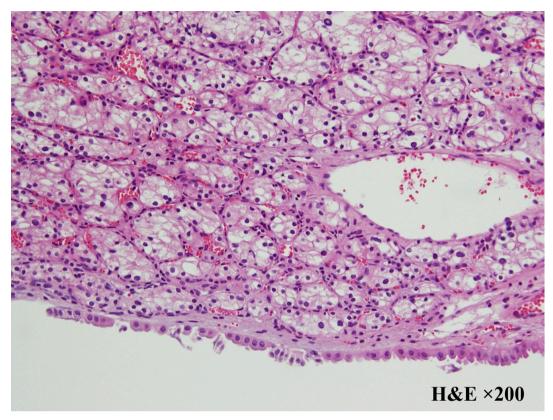


Fig. 3. Histological staining of the gallbladder tumor that was diagnosed as metastasis of clear cell renal cell carcinoma.

to follow the patient by combining several imaging modalities to determine various patterns of metastasis. Early detection and appropriate treatment can contribute to a better prognosis.

## **Conflicts of interest**

None declared.

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