

## Case Report

# Osteoclast-Like Giant Cell Carcinoma of the Distal Ureter

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Extraskeletal osteoclast-like giant cell (OGC) tumors are uncommon and have mainly been found in the breast and pancreas. OGC neoplasms of the urinary tract are extremely rare. Most cases found in the renal pelvis and bladder are associated with either an *in situ* urothelial malignancy or a conventional high-grade urothelial carcinoma. These malignancies tend to be associated with a poor prognosis and disease course. To our knowledge, no cases of OGC tumors of the distal ureter only have been published. Here, we present the case of a 76-year-old man who underwent hand-assisted laparoscopic nephroureterectomy because of painless gross hematuria with right flank pain. Pathologic examination showed OGC carcinoma of the right distal ureter. No local tumor recurrence or distant metastasis was found at the 5-month follow-up.

**Key Words:** Giant cell carcinoma; Osteoclasts; Ureter

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Extraskeletal osteoclast-like giant cell (OGC) tumors usually originate from bone, tendon, sheath, or soft tissue and consist of oval, plump mononuclear cells. OGC tumors have a slow growth rate and a low incidence of malignant behavior. Tumors with similar histologic characteristics have been described in a variety of visceral organs, such as the pancreas, ovary, larynx, thyroid, and salivary glands [1]. The etiology and histogenesis of OGC tumors are controversial and have largely remained unexplained. To the best of our knowledge, fewer than 30 case reports of OGC tumors of the urinary tract have been published in the English literature [2-6]. The most common tumor locations in the urinary tract are the kidney, renal pelvis, and bladder. Only one case of OGC carcinoma of the bladder with right ureter invasion has been reported [6]. Here, we report a case of OGC carcinoma of the distal ureter without a bladder tumor.

### CASE REPORT

A 76-year-old male ex-smoker presented with a recent history of hematuria and transient right-flank pain. On physical examination, no mass was palpable in the abdomen, and no costovertebral angle tenderness was found. Hemogram and blood chemistry results were normal, except for azotemia (serum creatinine, 2.2 ng/ml). Intravenous pyelography showed a filling defect of the right distal ureter.

Magnetic resonance urography confirmed an irregular ureter mass 2 cm from the ureterovesical junction of approximately 5 cm (Fig. 1). No findings suggested lymphadenopathy or distant metastasis. Cystoscopy showed no



**FIG. 1.** Magnetic resonance urography shows an eccentric enhanced mural thickening of the right distal ureter 2 cm from the ureterovesical junction and measuring approximately 5 cm.

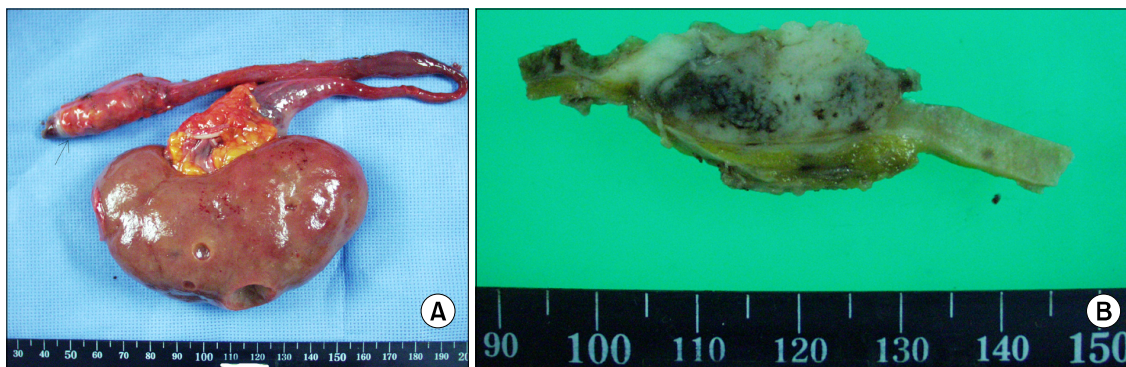


FIG. 2. Gross image of the kidney and distal ureter tumor.

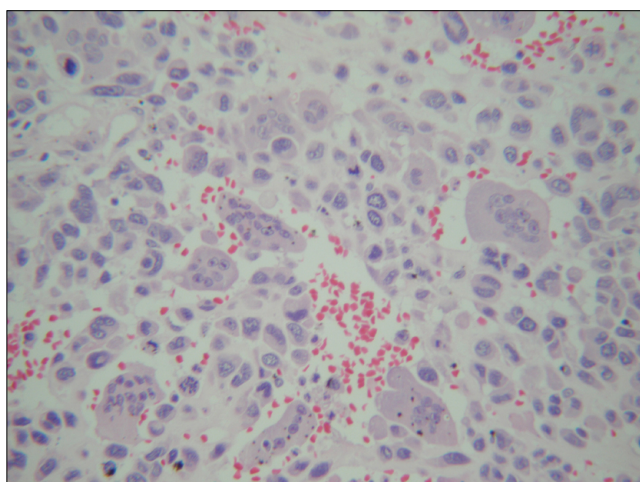


FIG. 3. Pathologic examination shows osteoclast-like giant cell carcinoma (H&E, x200).

abnormalities in the urinary bladder, and the findings of urine cytologic examination were negative.

Ureteroscopy showed a nodular lesion obstructing the distal ureter. A complete right hand-assisted laparoscopic nephroureterectomy was performed. Grossly, several small and large simple cysts were observed in the renal cortex, of which the largest measured 3x2 cm. The pelvis was cystically dilated and was shown to contain clear fluid. The distal end area was dilated, and an irregular polypoid mass measuring 5x1.5x1.2 cm was identified 2 cm from the bladder cuff (Fig. 2). Microscopically, a population of mononuclear cells with numerous interspersed multinucleated giant cells were observed. The mononuclear cells contained round- to oval-shaped nuclei with vesicular chromatin, inconspicuous nucleoli, moderate nuclear clearing, and mild nuclear pleomorphism. The cytoplasm was amphophilic, and cytoplasmic vacuolation was observed in the focal cells. Approximately 2 mitoses per 10 high-power fields were observed. OGCs had multiple round-to-oval, bland-appearing nuclei ranging from 4 to 34 in number. Their cytoplasm was eosinophilic and had well-demarcated cellular boundaries (Fig. 3). Areas of conventional high-grade urothelial carcinoma were noted adjacent to the tumor. The

tumor invaded focally into the periureteric adipose tissue and was categorized as American Joint Committee on Cancer stage pT3NxMx. Immunohistologic examination showed that the multinucleated giant cells were positive for CD68, CD45, epithelial membrane antigen (EMA), vimentin, and cytokeratin (cytoplasmic but not nuclear staining) and negative for desmin and CD31 (Fig. 4). At the 5-month postsurgical follow-up, the patient was doing well, had no evidence of disease recurrence, and had a serum creatinine level of 2.5 ng/ml.

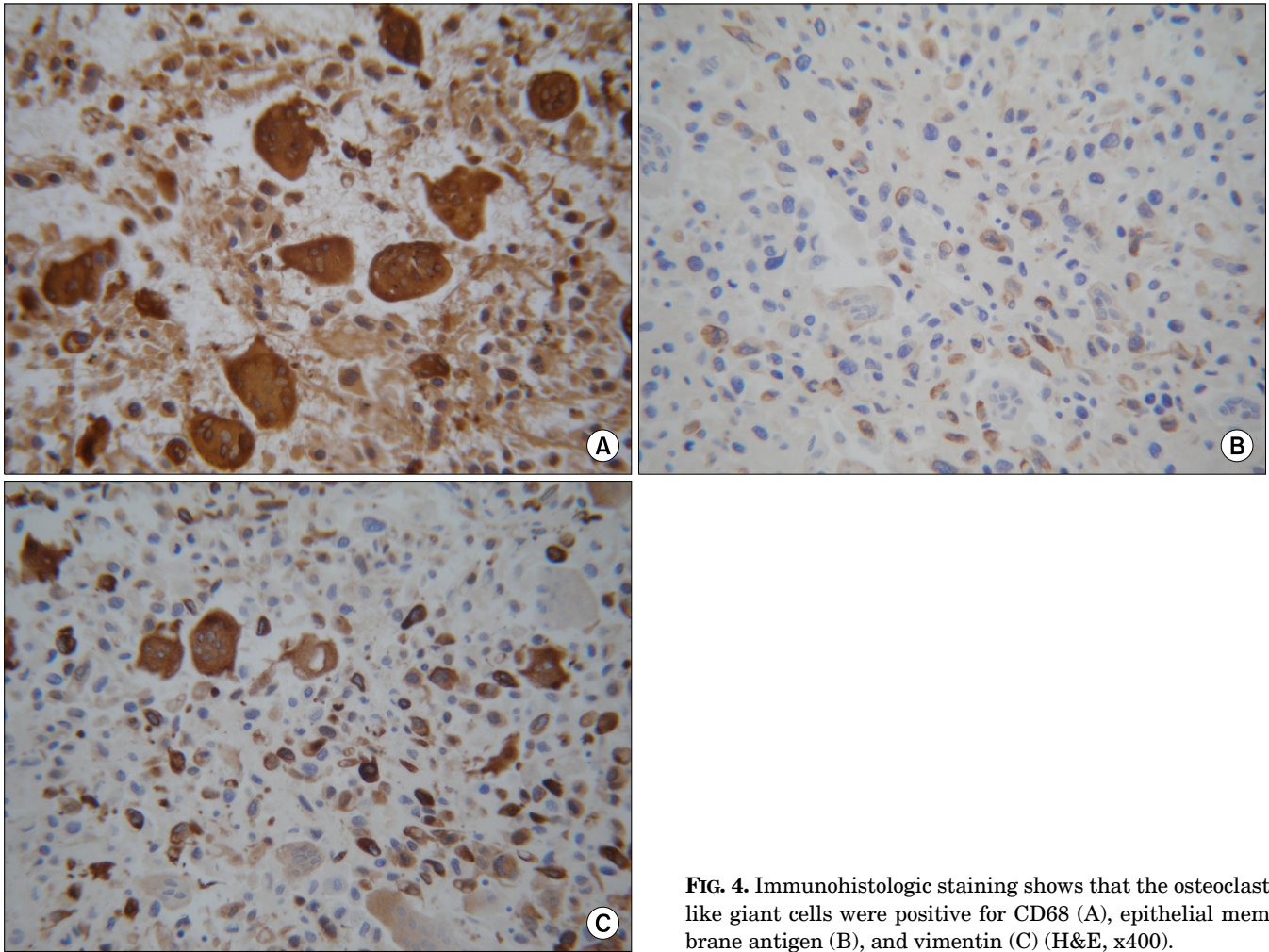
## DISCUSSION

Extraskeletal OGC carcinoma of the urinary tract is extremely rare and has most frequently been reported in the breast and pancreas. Fewer than 30 case reports of OGC tumors of the urinary tract have been published in the English literature [2-6]. The most common tumor locations in the urinary tract are the kidney, renal pelvis, and bladder. Only one case of OGC carcinoma of the bladder with right ureter invasion has been reported [6]. To the best of our knowledge, this is the first case report of an OGC carcinoma of the distal ureter without a bladder tumor.

Much controversy exists regarding the nature and origin of epithelial, histiocytic, and mesenchymal OGCs. One study indicated that these types of OGCs may result from the fusion of mononuclear histiocytes/macrophages, which are attracted to the tumor by growth or chemotactic factors released by neoplastic epithelial cells [7]. Immunohistochemical analysis in this previous study showed that the OGCs were positive for vimentin, EMA, and the cell surface proteins CD68 and CD45 and were negative for cytokeratin [8]. The prognostic implication of these immunohistochemical results remains unclear. Further investigation is needed to improve our understanding of this phenomenon.

The symptoms of extraskeletal OGC carcinoma in the urinary tract are nonspecific. As is well known, hematuria and flank pain are the most common and frequent initial symptoms [2]. The appearance of OGC carcinoma under cystoureteroscopy is similar to that of other urothelial tumors. Because of the rarity of OGC tumors in the urinary tract, its prognosis is unclear. Previous reports indicate





**FIG. 4.** Immunohistologic staining shows that the osteoclast-like giant cells were positive for CD68 (A), epithelial membrane antigen (B), and vimentin (C) (H&E, x400).

that the median survival rate associated with OGC tumors is less than 2 years [2]. Surgery is the treatment of choice. Aggressive management is recommended because of the poor prognosis of this condition; however, no adjuvant treatment has yet been established. Adjuvant radiation therapy may be beneficial, because giant cell tumors of the bone are radiosensitive. Although adjuvant chemotherapy, such as mitoxantrone/etoposide/cyclosporine, has been reported to be beneficial in patients with transitional cell carcinoma of the urinary tract, a large population-based study is needed to confirm the benefits of such therapy in the treatment of invasive OGC tumors of the urinary tract [8]. Previous reports indicate that extensive surgical excision appears to be the recommended treatment for primary or recurrent lesions until the treatment benefits of adjuvant chemotherapy or radiotherapy are established.

#### Conflicts of Interest

The authors have nothing to disclose.

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