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Case Report

# Ureteral obstruction by sloughed tumor complicating cryoablation of a renal oncocytoma

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ABSTRACT

Percutaneous cryoablation for renal tumors may be associated with rare complications such as injury to the ureter. A 65-year-old woman underwent percutaneous cryoablation after a transcatheter arterial embolization using lipiodol and ethanol for left renal oncocytoma. Two months after the percutaneous cryoablation, computed tomography images showed left hydronephrosis caused by high-density debris, which was assumed to be sloughed tumor with lipiodol accumulation in the left ureter. A stent was placed in the left ureter to enhance the drainage of urine and the necrotic cell debris. Three months later, the ureteral stent was removed, and she remained asymptomatic during the follow-up period of 4 months. We should consider the possibility of urinary tract obstruction by sloughed tumor when hydronephrosis occurs after percutaneous cryoablation of a renal tumor.



## Introduction

Percutaneous cryoablation (PCA) is a minimally invasive treatment for renal tumors, with a low frequency of serious complications [1]. Although hemorrhage is the most common complication of renal PCA rare complications such as, injury to the adjacent organs including the bowel or the ureter, abscess formation requiring intervention, and pneumothorax could occur. We report a case of hydronephrosis, which was caused by the obstruction of the urinary tract by sloughed tumor cells after PCA of a renal tumor.

## Case report

A 65-year-old woman with a history of myasthenia gravis was referred to our hospital. Computed tomography (CT) images revealed a 4-cm, solid, endophytic tumor in her left kidney

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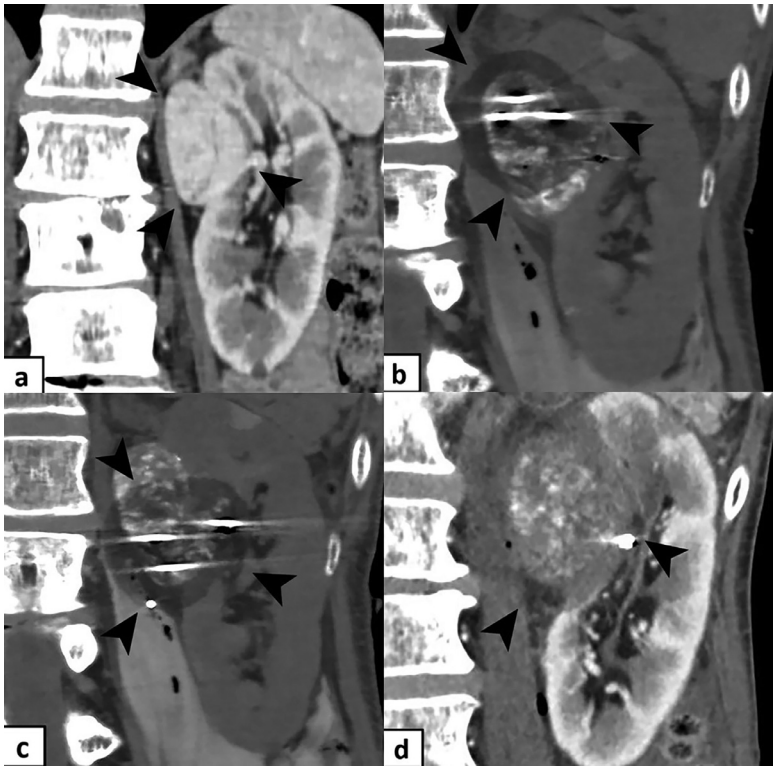


**Fig. 1 – (a) Pretreatment contrast-enhanced computed tomography (CT) demonstrates a left renal tumor close to the renal pelvis; CT during cryoablation demonstrates a low-density area (i.e. ice ball) with 3 cryoprobes in the upper (b) and lower (c) parts of the tumor; (d) CT image 2 days after the cryoablation shows an ablation zone with an adequate treatment margin.**

(Fig. 1A) as well as another small tumor in her right kidney. Percutaneous biopsy of the left renal tumor suggested the diagnosis of oncocytoma. We decided to treat the left renal tumor by PCA for addressing the concern regarding the existence of a hybrid tumor with features of oncocytoma and renal cell carcinoma [2]. Prior to the PCA, we performed a transcatheter arterial embolization (TAE) to enhance the therapeutic effect and to reduce the risk of bleeding. The embolization was selectively performed using a mixture of ethanol and ethiodized oil (Lipiodol, Guerbet, Villepinte, France) at a ratio of 7:3. Two days later, PCA of the left renal tumor was performed using an argon-based cryoablation system (CryoHit, Galil Medical, Yokneam, Israel). First, three 17-gauge cryoprobes (IceRod, Galil Medical, Yokneam, Israel) were inserted to the upper part of the tumor. The cryoprobes were inserted sequentially in a triangle configuration, under CT fluoroscopy guidance. After the placement of the three cryoprobes, PCA was performed in two 15-minute freeze cycles separated by 2 minutes of thawing (Fig. 1B). Then, the same treatment was carried out in the lower part of the tumor (Fig. 1C). During freezing, the low-density area (i.e., ice-ball) involved the entire tumor and calices of the upper medial part of the left kidney.

The CT images obtained 2 days after the PCA demonstrated the ablation zone, which included the tumor with an adequate ablation margin (Fig. 1D), without any evidence of complication after the treatment. However, 2 months after the PCA, the patient visited our institution with complaints of high fever and left-sided back pain. Laboratory tests revealed an increased inflammatory response (leukocyte count: $9.88 \times 10^9$/L, C-reactive protein: 154 nmol/L). CT images demonstrated a left perirenal abscess and left hydronephrosis with high-density debris in the lower part of the left ureter (Figs. 2A and B). We supposed that this high-density debris consisted of sloughed tumor with ethiodized oil accumulation and was the cause of the urinary tract obstruction. A single-J stent was placed in the left ureter for allowing the drainage of urine and the necrotic tumor debris. The back pain disappeared immediately after the stent placement, whereas the fever and laboratory findings improved gradually. CT images obtained 2 days after the stent placement demonstrated improvement in hydronephrosis and drainage of necrotic tumor into the tract of the urinary fistula (Fig. 2C). On the CT images obtained 5 days after the stent placement, the necrotic tumor debris was not observed and the hydronephrosis appeared to have improved. The patient was discharged after replacing the single-J stent with a double-J stent. Three months later, the double-J stent was removed, and she remained asymptomatic during the follow-up period of 4 months.

## Discussion

The frequency of severe complications after PCA of renal tumors was reported to be about 2%-6%, and therefore, this treatment is recognized as a minimally invasive treatment