







■ Case Report

## The use of ureteral stenting for tumor surrounded abdominal ureter in gynecologic oncology

### *Jinekolojik onkolojide tümör sarılı abdominal üreter için üreteral stent kullanımı*

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#### Abstract

For ovarian cancer, recurrence is commonly noted, and the tumor implants involve the bowels, ureter, liver, spleen, parietal peritoneum, diaphragm or the mesenteric peritoneum in recurrent cases. In tumor disseminated cases, the dissection of the ureter will be difficult, and an injury can easily be performed. Ureteral stenting is a feasible option for advanced oncologic cases to facilitate ureteral dissection and avoid probable injuries. Here, we demonstrate ureteral stenting for the left abdominal ureter in a recurrent ovarian cancer patient to resect a lateral aortic tumor mass.

**Key words:** Ureteral stenting; ovarian cancer; anatomy; cytoreduction; injury

#### Öz

Over kanserinde rekürens sıklıkla gözlenir ve rekürrent vakalarda barsaklar, üreter, karaciğer, dalak, parietal periton, diafragma veya mezenterik periton tümör implantları ile tutulabilir. Yaygın tümör olan vakalarda ureter diseksiyonu zor olabilir ve zedelenme rahatlıkla oluşabilir. Üreteral stent kullanımı, ileri onkolojik vakalarda uygulanabilecek bir seçenek olup, üreteral diseksiyonu kolaylaştırır ve olası zedelenmeleri azaltır. Burada, lateral aortik tümöral kitlesi olan rekürrent over kanseri hastasında sol abdominal üreter için üreteral stent kullanımı sunulmuştur.

**Anahtar kelimeler:** Üreteral stent; over kanseri; anatomi; sitoredüksiyon; zedelenme

## 1. Introduction

Cytoreductive surgery with the aim of maximal debulking without leaving any residual tumor is the cornerstone of ovarian cancer treatment. Despite the surgical interventions and chemotherapy administration, most of the ovarian cancer cases recur. However, in that particular patient group, secondary cytoreductive surgery is planned only in selected patients to minimize the surgery-related complications and not to interfere with the goals of chemotherapeutic agents and targeted therapy (1).

In patients with recurrences; the bowels, ureter, liver, spleen, parietal peritoneum, diaphragm or the mesenteric peritoneum will be involved by the tumor implants (2). Before deciding secondary cytoreductive surgery, a proper preoperative workup with magnetic resonance imaging (MRI), computed tomography (CT) or positron emission tomography (PET) is essential to identify the tumor sites. Additionally, in debulking surgery, especially for recurrent cases, the abdominal organs are more vulnerable to an injury and restoring the injury with a functional system is the basis of surgical approach.

Here, we demonstrate the surgical anatomy of abdominal ureter and role of ureteral stents in a recurrent ovarian cancer patient where the tumor implants surround the abdominal ureter.

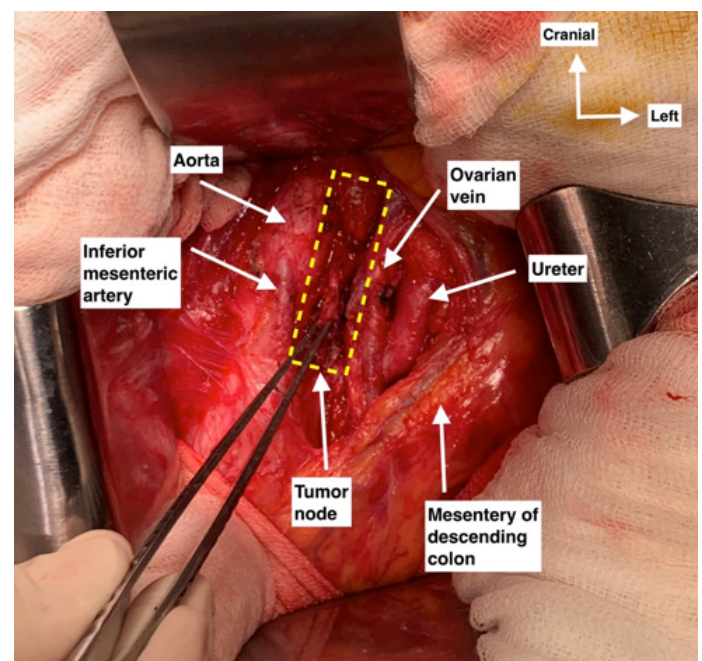
## 2. Case report

A 59 years-old patient was detected with a slightly increased level of serum Ca-125 (69 U/mL) 17 months after the upfront maximal cytoreductive surgery, in whom the final pathology result was ovarian clear cell carcinoma. There was no ascites at the transvaginal sonography, and the PET-CT revealed increased uptake of fluorodeoxyglucose (Standardized Uptake Value maximum: 18.71) on the left lateral aortic lymph node below the left renal vein, 2x4 cm in dimension. There was no evidence of peritoneal carcinomatosis. Before preparation of this case report, informed consent was taken from the patient.

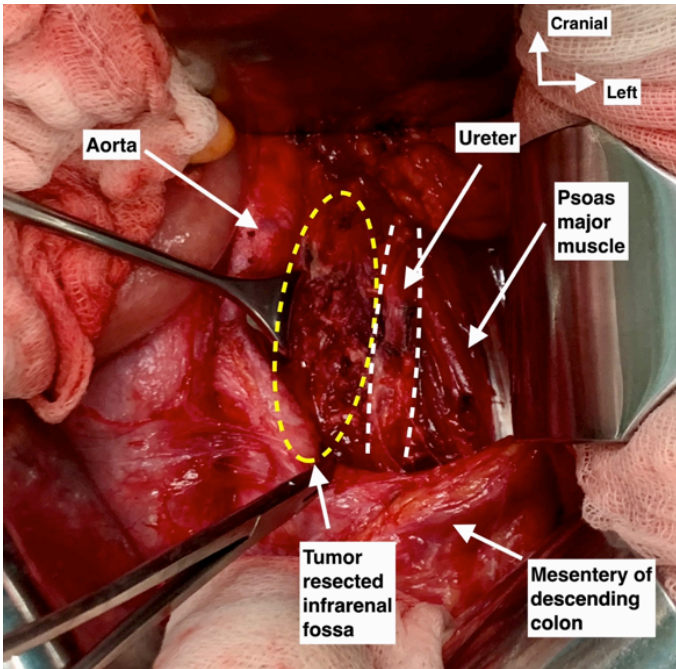
## 3. Surgical procedure

The left lateral parietal peritoneal structure surrounding the left paracolic gutter was cut, and access to the retroperitoneum was maintained. The descending colon was mobilized medially after cutting the peritoneal attachment along the Toldt's fascia. The tumor implants were palpated approximately 5-cm cranial to the pelvic brim over the psoas major muscle inferior to the left renal vein (**Figure 1**). However, a substantial dissection could not

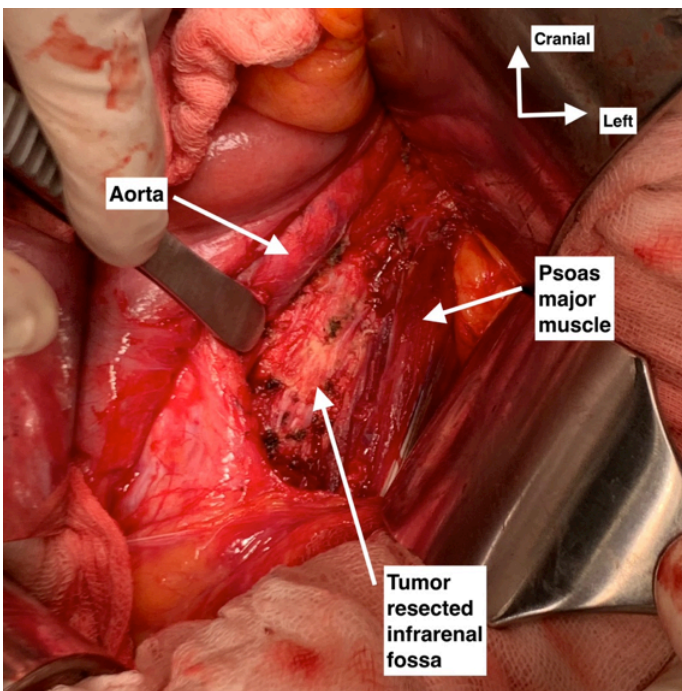
be maintained there, so just the area was identified with the left abdominal ureter. On the anterior surface of the aorta and inferior vena cava; the inferior mesenteric vein was strictly attached to the aorta and mesenteric peritoneum of descending colon, so it was dissected and mobilized laterally. The inferior mesenteric artery was found 3-cm cranial to the aortic bifurcation and secured. The peritoneal structure of the mesentery of descending colon was cut above the inferior mesenteric artery, and access to the left infrarenal fossa was maintained. The tumor deposits below the left renal vein were found to be strictly attached to the aorta, vertebral body on the retro aortic area and left ovarian vein. The left ovarian vein was densely attached to the left ureter. After the consultation to the urology team, left ureteral stent was inserted intraoperatively via a cystoscope (**Figure 2**). Afterwards, by performing sharp dissections and using thermal energy, the mass was excised entirely with the relevant segment of the left ovarian vein. The inserted ureteral stent facilitated the dissection of ureter from the left ovarian vein by improving the identification of ureteral borders (**Figure 3**). There was no intraoperative injury to the ureter, and the ureteral stent was removed two weeks after the surgery via a cystoscope and no postoperative complication was detected. During the 3<sup>rd</sup> month control, no long term complication was also detected.



**Figure 1.** Tumor mass on the left lateral aortic area invading the left ovarian vein and attached to the left ureter



**Figure 2.** After resection of the tumor mass, left infrarenal fossa, the ureteral stent inside the left abdominal ureter



**Figure 3.** Tumor resected from the left infrarenal fossa, the left abdominal ureter is retracted laterally

#### 4. Discussion

Ureteral obstruction is mostly seen in patients who has an extensive tumor burden in the pelvis or when a solitary tumor interrupts the flow of the urine through the ureteral pathway. In that patient group, after preoperative identification of this

circumstance, a careful surgery with meticulous dissections around the ureter is needed; otherwise, any brutal movement will lead to a devascularization in one segment of the ureter. Nevertheless, sometimes identification of the ureter is difficult due to the tumor involvement and the tumor deposits nearby the ureter will bring about an extensive dissection along the ureteral pathway. Hence, the use of ureteral stents is suggested to improve the identification and dissection of the ureter. In this context, the risk of ureteral injury will be decreased.

In patients with disseminated ovarian cancer, the most common reason for preoperative ureteral stenting is hydronephrosis; also hydronephrosis commonly accompanies this situation (3). While ureteral stenting, mainly a 'pigtail' or 'JJ' catheter is used which could be applied preoperatively via a cystoscope or intraoperatively through the cystoscope, or directly through the ureter intraoperatively after a 2-3 mm longitudinal incision on the ureter. Ang and Naik (3) showed that, in their series of 14 out of 442 ovarian cancer patients ureteral stenting was needed during ultra-radical surgery and no ureteral injury was observed in those patients when an ureteral stent was inserted intraoperatively after detecting extensive tumor dissemination with ureteral dilatation.

The incidence of iatrogenic ureteral injury during gynaecological and urological surgeries is 0.2-3%; however, this rate increases up to 6% with advanced oncological abdominal and pelvic surgeries (4). Thus Fuggazola et al. (5) supported the beneficial role of prophylactic ureteral stents in their series of patients with cytoreductive surgery and hyperthermic intraperitoneal chemotherapy. In gynecologic oncology practice, the ureteral stenting is mostly applied due to the extensive tumor dissemination in the pelvis. The complicated anatomy of the pelvis, which has many structures in close relationship with the ureter and the surgical procedures in which complete mobilization of the ureter is needed are the factors that increase the risk of ureter injury. Peritoneal carcinomatosis is one of the significant reasons for ureteral stenting that is most commonly performed in recurrent cases. Abu-Zaid et al. (6) retrospectively analyzed the role of ureteral stenting in gynecologic related peritoneal carcinomatosis cases. Ureteral stenting was applied in 53 patients, and no major intraoperative complication or injury was observed, in addition to this in the post-operative 6 months period no major urinary tract complication was detected. They suggested prophylactic ureteral stenting as a

safe and feasible option to decrease the risk of ureteral injury. When carcinomatosis is detected; the peritoneal structure is affected by an inflammatory reaction and severe tissue edema, thereby intraoperative visualization and dissection of the ureter become difficult. In those cases, prophylactic ureteral stenting facilitates identification of the ureter and ureteral injuries while allowing intraoperative management. Moreover, it provides a comprehensive dissection (7-9). One main stent-related complication is hematuria; however, it is a transient issue, and no significant morbidity was detected concerning ureteral stenting (10). The prophylactic ureteral stents can be removed immediately at the end of the operation or can remain up to 6 weeks depending on the radicality of the dissection and surgical procedure.

In our case, we used the ureteral stent to identify the borders of the abdominal ureter because the fixed, firm and solid structure of the tumor mass with adhesions to the adjacent anatomic structures (left ovarian vein and aorta) increased the risk of ureteral injury during the sharp dissections and use of thermal energy.

In conclusion, the ureteral stenting could be used safely in selected gynecologic oncology cases to facilitate the ureteral dissection and avoid probable injuries.

### Declaration of Interest

The authors declare no conflict of interest.

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