Experience of Successful Treatment for an Intractable Advanced Ureter Cancer with Extra ureteral Extension using Omental Flap Transposition: A Case Report

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Abstract

We report on a 61-year-old female case of advanced ureter cancer using omental flap transposition (OFT) with tumor reduction surgery before adjuvant pelvic irradiation to prolong survival and to prevent pelvic complication from irradiation, resulting in a stable disease state for one year without serious major morbidity. The patient presented with growing pelvic pain and constipation for three months without gross hematuria or flank pain. She was diagnosed with stage IV (T4N2M0) left distal ureter cancer extending to the left iliac vessels. After three cycles of neoadjuvant combination chemotherapy of gemcitabine-cisplatin, left nephroureterectomy with a resection of the bladder cuff and ipsilateral salpingo-oophorectomy with lymph node dissection, and segmental colon resection with OFT were performed. Then, 30 adjuvant radiations at a fractionated dose of 6880 cGy on left-sided pelvic areas enabled the patient to remain in a stable disease state without progression or loco-regional recurrence, and no severe complications occurred during follow-up. Therefore, owing to the OFT with surgical reduction of tumor burden, adjuvant high dosing radiotherapy was performed effectively and safely in advanced ureter cancer without occurrence of severe radiation-related complications.

Keywords: Omental flap transposition; Ureter cancer; Neoadjuvant; Multimodality; Adjuvant; Radiation

Introduction

Urothelial carcinoma (UC) of the upper urinary tract is a relatively rare disease representing less than 1% of genitourinary neoplasms and 5-7% of all urinary tract tumors [1]. According to the National Cancer Institute SEER program, 5-year overall survival in UC of the upper urinary tract is 63% in node positive patients and 17% in metastatic disease, and loco-regional failure is also frequently reported in 30-50% of patients with advanced disease despite having undergone primary aggressive surgery [2]. This high recurrence rate has been a strong argument for adjuvant therapy for all patients with locally advanced disease even after complete resection. A recent review of selected series of surgery with adjuvant radiotherapy for UC of the upper urinary tract found some improvement in decreasing percentage of loco-regional failure and increasing survival rate [3]. However, before planning the adjuvant radiotherapy, the expected morbidity relating to the radiating fields is a critical problem in patients with advanced ureter cancer. Therefore, we report on a case of advanced ureter cancer in our institute using Omental Flap Transposition (OFT) with tumor reduction surgery before high dosing adjuvant radiotherapy, resulting in a stable disease state for one year without occurrence of serious major morbidity.

Case Report

A 61-year-old female presented with growing pelvic pain and constipation for three months without gross hematuria or flank pain. After thorough uro-gynecologic and colorectal examination, no palpable mass was detected at both vagina and rectum, with no malignant cells in both Pap smear and urine cytology tests. The imaging studies, including computerized tomography and magnetic resonance imaging, suggested suspicious diagnosis of either left salphingal cancer or actinomycosis with retroperitoneal invasion, or a left ureteral tumor with extraureteral extension without metastasis (Figure 1A and 1B). Diagnostic ureteroscopy with biopsy and retrograde pyelography performed for the differential diagnosis confirmed left distal ureter cancer with poorly differentiated UC (Figure 1C). After three cycles of neoadjuvant combination chemotherapy with 1000 mg/m2 based gemcitabine and 70 mg/m2 based cisplatin, imaging studies showed decreased mass in the pelvis, enabling performance of surgery. Left nephroureterectomy with a resection of the bladder cuff and ipsilateral salpingo-oophorectomy with lymph node dissection, and segmental colon resection with OFT were performed successfully for removal of operable tumor masses as much as possible. For preparation of OFT, the omentum from the transverse colon was separated with one transverse incision below the gastroepiploic arch from right to left until the middle omental artery was reached. It should be placed in the pelvis without torsion of the pedicle to avoid strangulation of the omentum and loops of the small bowel and placed with suture fixation between the bladder and suspicious tumor site. Final pathologic stage was pT4N2M0 with poorly differentiated UC of the left distal ureter with extension to perireteric, periovaryian tissues, and to external lymph nodes. The patient was discharged on post-operative day 7 without any eventful complication. After postoperative one month, no evidence of gross masses on the left pelvic wall. After 30 adjuvant radiations of a fractionated dose of 6880 cGy dose, the follow-up imaging studies showed neither loco-regional tumor recurrence nor metastasis with...
chemotherapy in advanced ureter cancers, UCs are reported to be 
non-responsive to treatment including chemotherapy and radiation [3]. Despite 
advances in treatment of advanced ureter cancers, surgical margins or local 
lymph nodes may be considered for adjuvant radiation after surgery. The 
rationale for local radiation therapy is to decrease the risk of local 
relapse after radical surgery for locally advanced non-organ-confined disease.

Discussion

OFT in situ at an adequate distance from bowel and bladder was shown 
in imaging work-ups (Figure 1D and Figure 1E).

depending on the patient's disease status, performance status, and comorbidities, there are many options for treatment of advanced 
ureter cancer; however, radical nephroureterectomy is the mainstay 
for treatment of T3-T4 ureter tumors. In spite of aggressive surgery in 
advanced ureter cancer, loco-regional failure is frequently reported [2].

Multimodality strategy has been suggested in treatment of 
advanced ureter cancer and recent studies have advocated the benefits 
of the therapy including chemotherapy and radiation [3]. Despite 
the lack of prospective studies on the beneficial effect of radiation and 
chemotherapy in advanced ureter cancers, UCs are reported to be 
responsible (39-65%) to cisplatin-based neo/adjuvant chemotherapy 
regimens [4], taxanes and/or gemcitabine chemotherapy [5], and 
adjuvant radiotherapy [6]. Patients with adverse factors such as a high 
grade or advanced stage, close or positive surgical margins or positive 
lymph nodes may be considered for adjuvant radiation after surgery. 

Significant interest has been generated in enabling the intensification 
of radiation while minimizing the irradiated dose to critical and 
sensitive normal tissues. Thus, various techniques have been used to 
minimize radiation to the small bowel and other adjacent organs in 
order to both reduce morbidity related radiation and control oncologic 
outcome such as OFT, omental sling, and re-peritonealization of the pelvic 
floor [8].

However, for OFT, protection of the small bowel and adjacent 
organs from radiation related toxicity is most important and provides 
a thick fatty barrier for prevention of small bowel obstruction in the 
event of pelvic recurrence as well as to separate separate spaces from 
adjacent organs for radiation [10]. Therefore, OFT technique effectively 
excluded small bowel and other adjacent organs from the radiation field 
and enables patients with inoperable advanced ureter cancer to receive 
radiation with oncologic control and minimal morbidity in order to 
secure separate spaces from the peritoneal cavity. Third, the OFT is regarded as a surgical 
means of therapeutic angiogenesis and has been used successfully in 
management of vesicovaginal fistulas and rectourethral fistulas [9].

Among these measures, OFT has several advantages in patients 
treated with pelvic radiation. First, autologous OFs provide a protective 
distance from radiosensitive normal tissues. Second, OFs can protect 
resected pelvic walls from local infection by packing dead space 
because it is the major source of leukocyte response in local infections 
and appears to help in removal of fluid, infective agents, and particulate 
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The rationale for local radiation therapy is to decrease the risk of local 
relapse after radical surgery for locally advanced non-organ-confined disease. 
However, retrospective results have shown that adjuvant 
radiotherapy is not beneficial. One explanation for this discrepancy 
is a suboptimal dose, 40 Gy–16 Gy, of radiation for fear of normal tissue 
damage to the small bowel, bladder, and other radiosensitive organs. 
Major morbidity rates of 2-10% and minor morbidity rates of 24-31% 
were reported, particularly adjacent organ-related complications such 
as perforation and fistula formation [7].

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References

survival during the last 2 decades. J Urol 164: 1523-1525.
Adjuvant chemotherapy with paclitaxel and carboplatin in patients 
with advanced carcinoma of the upper urinary tract. A study by the Hellenic 
electron radiotherapy and external beam radiotherapy for locally advanced 
Radiation therapy. A valuable adjunct in the management of carcinoma of the 
ureter. JAMA 206: 2871-2874.
normal tissue contouring guidelines for radiation therapy: a Radiation Therapy 
Oncology Group consensus panel atlas. Int J Radiat Oncol Biol Phys 83: e535- 
362.
cancer with whole abdominopelvic radiation therapy. Int J Radiat Oncol Biol 
Phys 48: 767-778.
