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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 salphingo-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 salphingeal 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/m^2 based gemcitabine and 70 mg/m^2 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 salphingo-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 periureteric, periovarian 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

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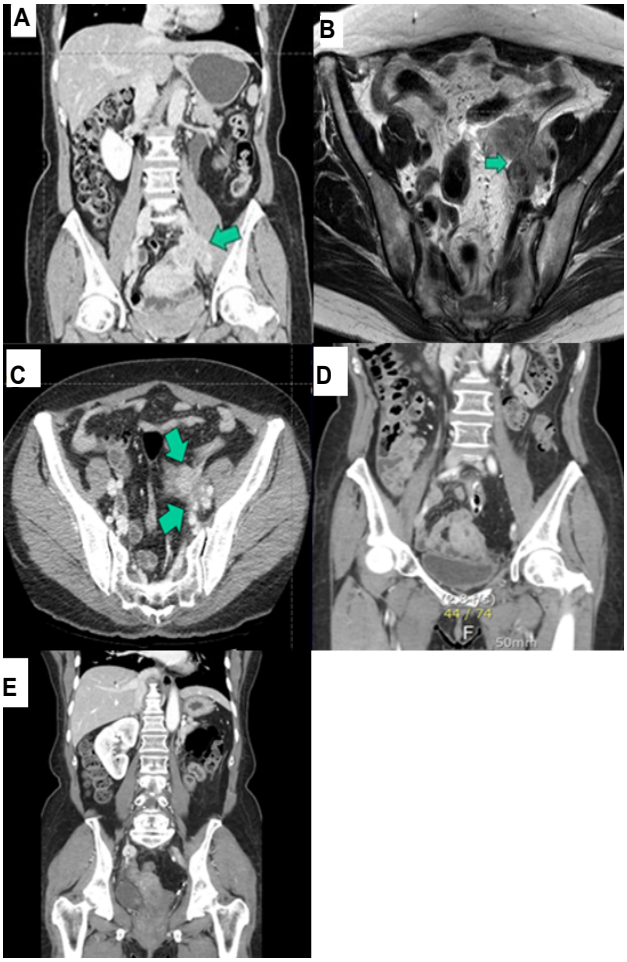

Figure 1: Baseline and postoperative imaging from computerized tomography, and magnetic resonance imaging A. Severe left hydroureteronephrosis with an infiltrating mass in the left pelvis was demonstrated in the coronal CT image. B. An infiltrating mass measuring 5 cm in size involving the left adnexa and encasing iliac vessels was demonstrated in the axial T2 weighted MRI image. C. Follow up CT images after three cycles of neoadjuvant chemotherapy showing a decreased size of tumor detected in the left pelvic wall. D. Pre RT imaging showing mental flap placed between the pelvic side wall and pelvic organ including the small bowel and bladder. E. Follow up CT images of CT demonstrating the consolidation of the remnant tumor areas without progression and increase of size.

OFT in situ at an adequate distance from bowel and bladder was shown in imaging work-ups (Figure 1D and Figure1E).

Discussion

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 a lack of prospective studies on the beneficial effect of radiation and chemotherapy in advanced ureter cancers, UCs are reported to be responsive (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. 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 radiation therapy 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].

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].

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 matter 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].

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 secure 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 improve their quality of life.

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