

# Good survival in a patient with recurrent transitional cell carcinoma of the ovary: A case report of PET-CT for detection and follow-up

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**Abstract.** Transitional cell carcinoma (TCC) of the ovary is a rare subtype of epithelial ovarian cancer. The present study reports the case of a 55-year-old patient from The Affiliated Tumor Hospital of Harbin Medical University (Harbin, Heilongjiang, China) who underwent successful surgery for recurrence of a TCC of the ovary with rectum metastases following the initial surgery and chemotherapy. Positron emission tomography/computed tomography (PET-CT) was used in the pre-operative detection of the tumor and the post-operative follow-up of the patient. To date, the patient has experienced 8 years of disease-free survival. The aim of the present study was to convey the good survival rate of the patient following recurrent TCC of the ovary, and the role of PET-CT in detection and follow-up, in order to aid in the future selection of appropriate diagnostic methods and therapies for this disease.

## Introduction

Transitional cell carcinoma (TCC) of the ovary, in contrast to that of the bladder, is a rare entity and therefore, studies of recurrence are few in number. The true incidence of TCC of the ovary remains unclear. TCCs represent a small percentage of ovarian cancers, and have been demonstrated to be a distinct group, with differing histological and immunohistological aspects. However, the clinical presentation of TCC is similar to that of other types of ovarian carcinoma (1). Its typical symptoms include abdominal pain, abdominal distension and pelvic masses, and serum CA-125 is usually positive. The primary

therapeutic approach for TCC is surgery and chemotherapy, and the consequent patient outcomes are an improvement on those of other types of common epithelial ovarian cancers (2).

## Case report

In 2004, a 55-year-old female was diagnosed with International Federation of Gynecology and Obstetrics stage IIIc (3) TCC of the ovary in the Department of Gynecology in The Affiliated First Hospital of Harbin Medical University (Harbin, Heilongjiang, China) and underwent satisfactory cytoreductive surgery consisting of hysterectomy, bilateral salpingo-oophorectomy, appendectomy and partial omentectomy. The post-surgical pathological evaluation revealed that the ovarian tumor was TCC, grade 3, with involvement of the appendix. Subsequently, seven cycles of chemotherapy were administered, consisting of paclitaxel (175 mg/m<sup>2</sup>; intravenously over 3 h) followed by carboplatin [area under the curve (AUC), 5-7.5 mg/ml/min; intravenously over 1 h] on day 1 of a three-week cycle, and a complete clinical response was achieved. Thereafter, the patient was followed up without any further treatment. Nearly two years after the initial therapy, the patient returned to hospital due to a two-month history of shapeless stool. The patient's cancer antigen (CA)-125 levels were within the normal range (normal range, <35 U/ml), and positron emission tomography-computed tomography (PET-CT) detected metastases of the rectum, with no other positive sites (Fig. 1). Review of the initial histopathology using immunohistochemistry revealed a grade 3 (poorly differentiated) TCC, and involvement of the appendix (stage IIIc, pT3cNxM0), therefore, recurrent disease accompanied by rectal metastases was diagnosed nearly two years after the initial therapy for stage IIIc TCC of the ovary. The patient underwent a partial resection of the rectum, and the metastatic tumors were completely resected. Histologically, the tumor of the rectum was a poorly-differentiated adenocarcinoma that originated from the ovary and was consistent with a metastasis. Post-operatively, the patient was administered 3 cycles of paclitaxel and carboplatin-based cyclic chemotherapy, with the same schedule as used in the initial treatment. After the three cycles, the symptom of shapeless stool disappeared and there was no residual tumor site on

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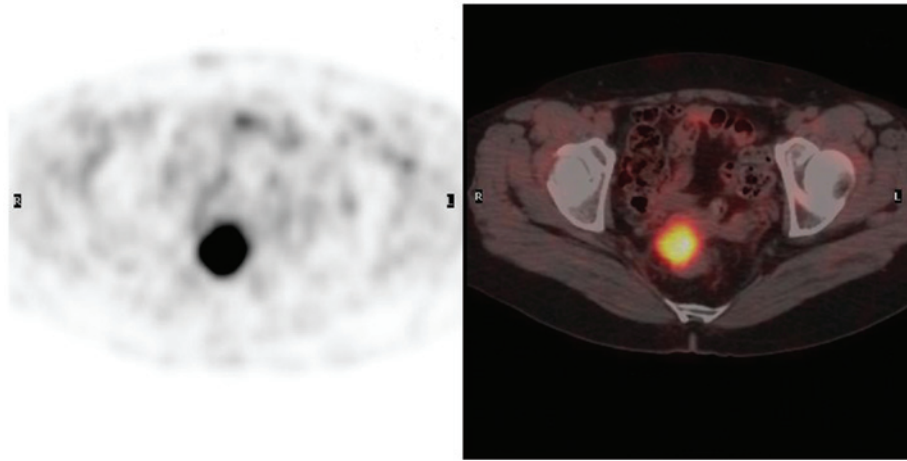


Figure 1. Pre-operative transaxial PET (left) and fused PET/computed tomography (right) slices demonstrating intense  $^{18}\text{F}$ -fluorodeoxyglucose uptake (standardized uptake value, 10.0) in the rectum, measuring 38.2x31.3 mm, consistent with metastasis. PET, positron emission tomography.

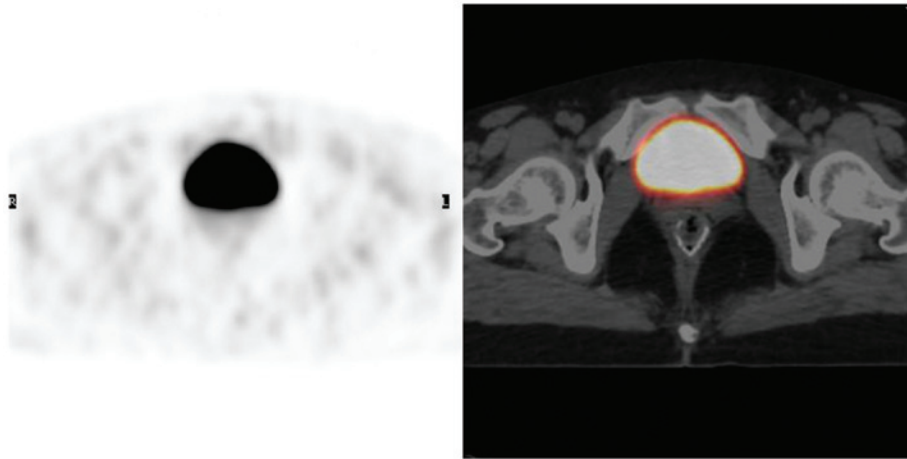


Figure 2. Transaxial PET (left), and fused PET/computed tomography (right) slices demonstrating no  $^{18}\text{F}$ -fluorodeoxyglucose uptake in the rectum following 3 cycles of post-operative chemotherapy. PET, positron emission tomography.

PET-CT (Fig. 2). Imaging of the abdomen and pelvis was normal, and the CA-125 level was also normal. The patient is currently being followed up by PET-CT examination once every year, and has been in clinical remission for >8 years without any additional therapy.

## Discussion

TCC of the ovary is a recently recognized subtype of ovarian cancer that has been described as a primary ovarian carcinoma with definite urothelial features, but no presence of benign, metaplastic and/or proliferating Brenner tumors. TCC of the ovary resembles urothelium rather than ovarian surface epithelium (mesothelium) (4,5). TCC of the ovary can occur as a component of a mixed cell type surface epithelial carcinoma, but usually occurs in pure form (6).

The clinical presentation of TCC and other types of ovarian carcinoma are indistinguishable (6). Although elevated levels of CA-125 are clinically useful as a serum marker of tumor progression and recurrence, CA-125 exhibits high sensitivity but low specificity for ovarian TCC (1). This was supported by the present case, where a recurrent normal level of CA-125

was present. Recent findings (7,8) have indicated that the p63 antigen is a marker for the differential diagnosis of TCCs and malignant Brenner tumors, as it was not found to be expressed in TCCs of the ovary.

A survival benefit may be generated using optimal surgical resection followed by cisplatin-based chemotherapy (9-11). In a previous study, the estimated 5-year survival rate following surgery in the entire group of 88 patients was 37%, whereas for patients who received chemotherapy following resection (76 patients), the survival rate was 41% (11). Clinical stage, the TCC component percentage in the primary tumor and the results of secondary surgery are all factors associated with the survival of patients who receive chemotherapy. A study by Gershenson *et al* (12) indicated that, compared with poorly-differentiated serous carcinoma, advanced-stage ovarian TCC was significantly more chemosensitive and was associated with a better prognosis. In the present case, the advanced-stage patient underwent successful surgery for a recurrence of TCC with rectal metastases and experienced an 8-year disease-free survival period, thus demonstrating the benefits of secondary cytoreductive surgery. Kommoss *et al* (9) also recorded a better prognosis

in patients with TCC compared with those with all other ovarian carcinoma types following standardized chemotherapy.

<sup>18</sup>F-fluorodeoxyglucose PET-CT is increasingly being used in the follow-up of patients with gynecological malignancies and suspected recurrent disease (13). In comparison to serum CA-125 assays and conventional imaging (ultrasound/CT/magnetic resonance imaging), PET-CT has been proven to be more efficient in detecting ovarian cancer recurrence (14). PET-CT is useful for the selection of patients for cytoreductive surgery from those with recurrent ovarian cancer (15). In the present case, TCC with rectal metastases was detected by PET-CT and proven pathologically. Thereafter, the patient was followed up by PET-CT annually.

TCC of the ovary is a rare subtype of epithelial ovarian cancer. Surgery followed by chemotherapy is the primary therapeutic approach. Although TCCs of the ovary are often of an advanced stage and recur following initial treatment, patients may experience a good survival outcome after successful secondary surgery. Furthermore, PET-CT plays a significant role in detection and follow-up.

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