

Research Letter

Squamous cell carcinoma occurring in the pelvis after total hysterectomy and bilateral salpingo-oophorectomy for an ovarian mature teratoma with malignant transformation

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Mature cystic teratoma (MCT) of the ovary, known as a dermoid cyst, is the most common benign ovarian cystic tumor in women during reproductive age, and accounts for 10~20% of all benign ovarian tumors [1]. Most of them are asymptomatic adnexal masses, which are incidentally detected on routine pelvic examination or with calcifications detected by pelvic imaging studies [2]. However, ovarian MCT might be the leading cause of ovarian tumor-inducing acute abdomen, especially during pregnancy, secondary to torsion of MCT [3]. Laparoscopic cystectomy is considered as a treatment of choice [4], based on the low incidence of malignant transformation (MT) – representing less than 0.5% – and the younger age of the patients, who need fertility preservation [5]. Laparoscopy can be performed feasibly through either conventional laparoscopy with/without modification, or a modern robotic technique [6–8].

Although MT from ovarian MCT is rare, the management is challenging, since the prognosis is poor and no standard treatment can be followed. Herein, we report a postmenopausal woman who was accidentally diagnosed as having ovarian MCT with MT after total hysterectomy (TH) and bilateral salpingo-oophorectomy (BSO). She did not receive

adjuvant therapy postoperatively, but was complicated by tumor recurrence 1 month after surgery. However, complete tumor resection, followed by concurrent chemoradiotherapy, saved the patient's life.

A 55-year-old postmenopausal woman, who complained of lower abdominal pain and fever, visited our hospital, where a right 5-cm ovarian cystic mass was diagnosed by transvaginal ultrasound. Laboratory evaluation and tumor markers were unremarkable. She underwent total abdominal hysterectomy and BSO uneventfully. The right ovary was embedded into the cul-de-sac, but was removed intact and smoothly. The final pathology showed a right ovarian MCT with MT-squamous cell carcinoma (SCC) (Fig. 1). The postoperative imaging study, including computed tomography (CT), and other tumor markers were negative. She did not receive adjuvant therapy. However, dull abdominal pain persisted and the patient experienced postoperative bowel function impairment. Physical examination located a mass lesion in the cul-de-sac 2 months later. A repeat CT scan showed a 15-cm pelvic mass at the cul-de-sac with compression of the rectum. Colonoscopy and laboratory investigations were negative, but some tumor markers were elevated, including SCC antigen = 67 ng/mL, carbohydrate antigen 199 = 84 U/mL, and cancer antigen (CA) 125 = 101 U/mL.

An exploratory laparotomy was performed 2 months after the initial operation. Operative findings included a 20-cm mass in the pelvis, with marked necrotic change on the tumor

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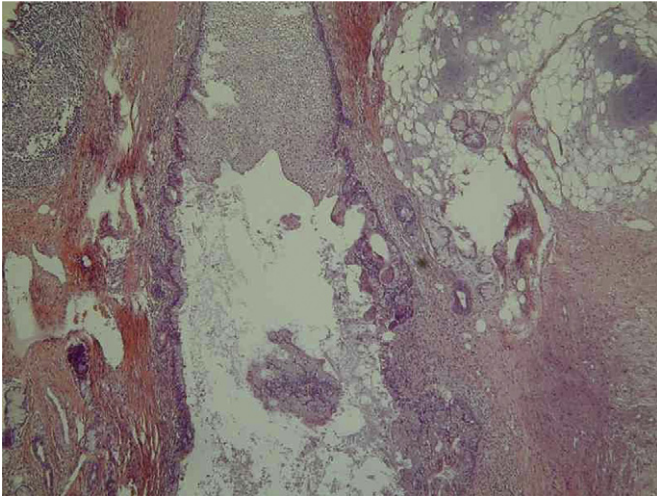


Fig. 1. Photomicrograph of the mature cystic teratoma reveals sebaceous glands, mature squamous epithelial cells and smooth muscles (H&E, $\times 100$).

surface, densely surrounded by the urinary bladder wall and lower recto-sigmoid colon and omentum. After delicate dissection, the bladder wall and vaginal stump could be identified, but the colon could not be separated from the tumor. A tumor resection, including segmental resection of the recto-sigmoid colon 20 cm above the anus, and Hartmann's procedure, were performed (Fig. 2). The pathological examination confirmed SCC (Fig. 3). The patient was treated post-operatively with concurrent chemoradiotherapy with cisplatin $50 \text{ mg/m}^2/\text{week}$ and pelvic radiotherapy with a total of 50 Gy. The patient has been free of disease for 3 years, up to this writing.

This case is a reminder to us of the following. First, we should know that the most common form of ovarian MCT with MT is SCC, and that it often occurs in postmenopausal women and represents 80% of MT. Second, it is nearly impossible to have a preoperative diagnosis, although a few reports claimed to have made a preoperative diagnosis by magnetic resonance



Fig. 2. Tumor adhesions to the recto-sigmoid colon, resected 20 cm above the anus.

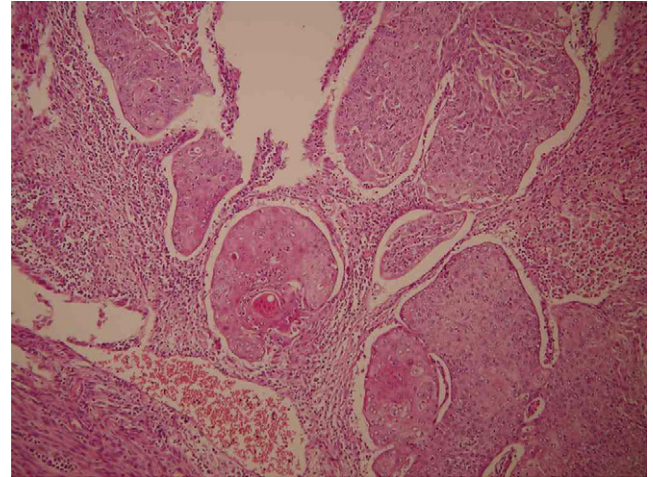


Fig. 3. Photomicrography showing infiltrating tumor nests of keratinizing squamous cell carcinoma of the recurrent abdomino-pelvic tumor (H&E, $\times 100$).

imaging (MRI) or CT scan [9, 10]. MRI, using a fat suppression technique, can show that malignancy should be suspected in a fat-containing MCT when there is an obvious non-fatty solid component, especially when the solid component demonstrates extracapsular extension or invasion of neighboring tissue [9]; by contrast, benign MCTs nearly always demonstrate a smooth surface [9]. CT imaging for MCT with MT shows the presence of a nodular-forming and enhancing soft tissue component, an obtuse angle between the soft tissue and the inner wall of the cyst, and extracapsular tumor growth with extension into adjacent structures or metastasis [10]. Without these high-cost techniques, only the patient's age and tumor size might be of value in assisting the diagnosis of MCT with MT, since MCT with MT is significantly bigger and affects patients who are considerably older. Tumor diameter $>99 \text{ mm}$ had a sensitivity and specificity of 86% and 74%, respectively, while age >45 years had a sensitivity and specificity of 70% and 75%, respectively, for the diagnosis of MCT with MT [9]. The patient in our presented case was elderly, although the tumor size was $<99 \text{ mm}$.

Third, since preoperative diagnosis of MCT with MT is difficult, what is the value of tumor markers? A recent systematic review and analysis of published data from 64 studies and 277 patients showed that 45/52 patients (86.5%) for whom serum concentrations were determined had high concentrations of SCC antigen, 36/51 (71%) had high CA 125, 30/39 (77%) had high carbohydrate antigen 199, and 16/24 (67%) had high carcinoembryonic antigen [11]. However, there was no correlation between concentrations of tumor markers and FIGO stage, although higher concentrations of SCC antigen and CA 125 were associated with adverse outcomes [11]. Using domestic data, Tseng showed that the possibility of MT is quite low when the patient is aged ≤ 39 years old and the serum SCC level is $<2.5 \text{ ng/mL}$ [12].

Fourth, will the surgical technique influence the prognosis? Although optimal cytoreduction (debulking) surgery, followed by paclitaxel and carboplatin has been documented to be associated with an improved survival rate in epithelial ovarian cancer

[13], there is no correlation between the optimal treatment for MCT with MT and that for its recurrence, as in this case. The prognosis heavily depends on the extent of the disease, the biological aggressiveness of the tumor, and the presence of a complete surgical resection similar to epithelial ovarian cancer [14]. A recent systematic review and analysis of published data summarized the following: (1) 4 patients with tumor stages >FIGO Ia who had undergone hysterectomy, had a better mean survival [49.9 months, standard deviation (SD) = 6.4 months; 95% confidence interval (CI) = 37.4–62.5 months] than those who did not have this surgery (15.8 months, SD = 3.5 months; 95% CI = 8.9–22.6 months); (2) omentectomy did not affect overall survival, but lymphadenectomy improved the chances of survival in patients with advanced stages (59.2 months, SD = 9.6 months; 95% CI = 40.4–78.0 vs. mean = 40.4 months, SD = 5.8 months; 95% CI = 28.9–51.8 months); and (3) a sub-analysis of 98 patients with stage I disease did not show poor survival for those whose tumors had ruptured [11]. In our presented case, the tumor was intact, although adhesion was noted, and a hysterectomy was performed, but the patient still had rapid tumor recurrence.

Fifth, the value of postoperative adjuvant therapy and the treatment strategy for recurrent tumor is still debated. A recent systematic review and analysis of published data did show a benefit of combination chemotherapy or postoperative radiotherapy for those patients with MCT with MT [11]. However, regimens with alkylating drugs were associated with increased survival in tumor stages >Ia, with a mean survival of 57.1 months (SD = 9.0 months; 95% CI = 39.5–74.8 months), compared with 25.2 months for regimens without alkylating agents (SD = 4.9 months; 95% CI = 15.6–34.8 months), using univariate analysis, but not multifactorial analysis [11]. In this case, though, we used cisplatin-based concurrent chemoradiotherapy as an adjuvant therapy, and the result was impressive.

In conclusion, ovarian MCT with MT is an unusual disorder for which there is little evidence to inform treatment. Based on the findings of this report, we believe that immediate rescue therapy for early recurrent MCT with MT might be acceptable for those patients with recurrent MCT with MT.

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