POOR PROGNOSIS OF INTRAOPERATIVE RUPTURE OF MATURE CYSTIC TERATOMA WITH MALIGNANT TRANSFORMATION

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SUMMARY

Objective: To present the phenomenon of the postoperative rapid progression of mature cystic teratoma (MCT) with malignant transformation (MT) when intraoperative spillage occurs during operation.

Case Reports: Two patients with MCT were treated, one with total hysterectomy plus bilateral salpingo-oophorectomy in an exploratory laparotomy, and the other with cystectomy with laparoscopy, respectively. Tumor spillage occurred during both operations. The postoperative pathology showed MCT with MT (squamous cell carcinoma type). Both patients were referred to our hospital and underwent treatment (3 months and 8 days, respectively, after the initial operation). At the secondary laparotomy for staging surgery, tumor dissemination was observed in both patients.

Conclusion: Whether or not tumor dissemination is correlated with tumor rupture during operation, we emphasize that any patient with a preoperative diagnosis of MCT should have it removed intact to avoid the possibly catastrophic event of tumor dissemination. [Taiwanese J Obstet Gynecol 2006;45(3):253–256]

Key Words: malignant transformation, mature cystic teratoma, spillage

Introduction

Mature cystic teratomas (MCTs) are the most common ovarian tumors in women of reproductive age. These tumors are conventionally treated with exploratory laparotomy [1]. Cystectomy is the most commonly used procedure and is considered to be a well-accepted procedure to preserve the fertility of the women, although a rare malignant transformation (MT) has been reported [2]. Laparoscopic surgery has gained global popularity since 1980, and is one of the most important procedural advances in the field of surgery [3,4]. It is effective in patients with benign ovarian tumors [5–7]. However, MCTs are always challenging for surgeons due to the potential risk of intraperitoneal rupture causing spillage of cyst content during laparoscopic surgery or the less common exploratory laparotomy [3,8,9]. Since tumor spillage during operation occurs frequently and is difficult to avoid, some authors have suggested that surgeons use the so-called controlled spillage method to deal with patients when this occurs [3]. The following cases demonstrate the possible risk of spillage after ruptured MCT either during laparoscopy or laparotomy.

Case Reports

Case 1
A 52-year-old, gravida 5, para 4, woman with no significant previous clinical history, was diagnosed with a 5 cm tuboovarian abscess of the right ovary. A total abdominal hysterectomy and bilateral salpingo-oophorectomy were performed. During the operation, dense adhesion
to the right pelvic wall was found. Intraoperative rupture of the tumor occurred during dissection. The spillage material had the usual appearance of MCT, including yellowish oil, hair and fatty tissue. All of the material was removed, followed by using a large amount of isotonic sodium chloride solution to clean the abdominal cavity. One week after the operation, pathology showed MCT with squamous cell carcinoma (SCC) transformation (moderate differentiation). The International Federation of Gynecology and Obstetrics (FIGO) stage was suggested as IC, although it was not adequately staged. The patient was then lost to follow-up. After 3 months, the patient visited our hospital due to acute onset of abdominal pain. Abdominal computed tomography demonstrated a 7 cm pelvic complex mass in the cul-de-sac. Serum levels of SCC antigen and CA-125 were 66.5 ng/mL (reference, <1.5 ng/mL) and 74 IU/mL (reference, <35 IU/mL), respectively, before the secondary exploratory laparotomy. Exploratory laparotomy showed a 7 cm tumor mass that had invaded the rectum wall without penetrating into the rectum mucosa. At the same time, several various sized tumors, ranging from 0.1 to 0.8 cm, were found scattered over the entire pelvis, including the vaginal cuff, the right side wall of the pelvis and the bladder surface. Optimal debulking surgery and Hartmann procedure were performed smoothly. Pathology results showed that the metastases were similar to the original SCC from the MCT. Initially, the patient was treated with concurrent chemoradiation (cisplatin 50 mg weekly and radiation 5,040 cGy for the entire pelvis), followed by additional four-course adjuvant chemotherapy with a bleomycin, etoposide and cisplatin (BEP) regimen. The patient was free of disease 6 months after completing therapy.

Case 2
A 32-year-old woman with no past systemic disease was diagnosed with a 7 cm MCT of the right ovary. The patient underwent laparoscopic cystectomy, but tumor spillage occurred during dissection. The tumor was excised completely and the specimen put into an endobag and removed through the umbilical port wound. A large amount of isotonic sodium chloride solution was used to clean the abdominal cavity, and the patient was discharged the next day in a stable condition. Pathology results showed MCT with squamous cell carcinoma (SCC) transformation 1 week after the initial operation. FIGO stage was suggested as IC, although it was not adequately staged. The patient was immediately referred to our hospital for further management. Serum levels of SCC antigen and CA-125 were not detected due to unknown reasons before the secondary exploratory laparotomy. Restaging surgery was performed; multiple metastases of tumors ranging from 0.3 to 0.8 cm covering the whole pelvic cavity and the omentum were found. A 2 cm tumor, the largest, had invaded the muscular layer of the rectum. Optimal debulking surgery, including total hysterectomy, bilateral salpingo-oophorectomy, appendectomy, infracolic omentectomy, multiple biopsies and lower rectal resection with end-to-end anastomosis, was performed. Pathology showed these tumors to be metastases of SCC, similar to the original tumor found in the MCT. Cytology results were positive for malignant cells. The patient underwent adjuvant chemotherapy, including a BEP regimen, a combination of ifosphamide and cisplatin, and a combination of paclitaxel and carboplatin, but she died 19 months after the initial operation.

Discussion
Malignancy was found in association with MCT in only 1–3% of cases [2]. The frequency of MT was related to age, with the highest incidence in women in their postmenopausal years. SCC accounts for 70–88% of all malignant tumors arising in MCT [8]. Although previous reports [10] have suggested that elderly patients often had MCT with MT, there is the possibility that young women may have MT arising from MCT of the ovary, as in Case 2 of this report. It seems prudent that in future, MCT in young women should be differentiated from MCT with MT by preoperative examination with diagnostic tools, including tumor markers and magnetic resonance imaging. Mori et al [10] reported that patients with MT averaged 55 years of age and had high serum SCC antigen levels, which were significantly different from those of patients who had MCT of the ovary (<40 years). In addition, Tseng et al reported that 16 of 24 (67%) patients with SCC arising in oварian MCT had elevated SCC antigen levels and all patients with recurrent lesions had re-elevated antigen levels in a series monitoring SCC. They suggested that serum SCC antigen monitoring might be helpful in the early detection of cancer recurrence [11]. In contrast, Rim et al remarked that serum SCC alone is not adequate to rule out MT because only 36.3% (4/11) of MTs showed elevated serum SCC level in their cases [12]. Therefore, the clinical usefulness of tumor markers in patients with MT arising in MCT of the ovary is unclear [13]. Unfortunately, the two patients in this report failed to undergo these kinds of examination before their first surgery and an elevated serum level of SCC was found in only one patient after tumor recurrence. Altogether, the values of serum SCC are unclear. Thus, we suggest that preoperative serum
SCC check-up and postoperative follow-up be done in cases of MCT.

Approximately 50% of patients with MCT and MT present with FIGO stage I, and 35–38% of patients present with stage III diseases [11,14]. Although there is still no consensus on specific prognostic indicators for MCT with MT, the grade, FIGO stage of the tumor, presence of residual disease and vascular invasion have been shown to be predictive of survival in retrospective studies [11]. Among these factors, the most important prognostic indicator of survival has been reported to be the intact ovarian capsule with confinement of the tumor within the ovarian tunica (stage IA) [15]. In fact, early-stage prognosis is good, ranging from 95% to 100% of FIGO stage I, and from 80% to 100% of FIGO stage II, respectively [11,14]. Till now, in patients with FIGO classification of stage I ovarian carcinoma, there is no convincing evidence that intraoperative tumor rupture promotes metastasis and worsens prognosis [16]. Patients with tumor rupture during surgery were staged as FIGO IC and were given adjuvant therapy. Although it was uncertain whether intraoperative rupture had the same prognostic significance as ovarian surface involvement and/or positive pelvic washings [17], more studies have suggested that intraoperative rupture has not been found to be a predictor of outcome in stage I ovarian cancer [16,18–21]. In contrast, the prognostic effects of rupture of the capsules with spillage and upstaging of MCT with MT that are possibly IA to more advanced stages, including IIC or III, remain controversial [22]. Mayer et al reported that careless intraoperative rupture of the capsule with spillage of the teratoma content would result in upstaging and additional morbidity [23], and they strongly recommend that aggressive adjuvant therapy be considered. As to stage I germ cell ovarian tumor, previous studies have addressed the issue of whether an intraoperative rupture influences the prognosis. Several researchers have concluded that rupture during surgery was significant only in univariate analyses [20], but was not significant in multivariate analysis. Furthermore, intraoperative rupture of ovarian cancer did not translate into shorter survival [2], nor was it a predictor of outcome [16,18–21]. It is still uncertain and controversial as to whether or not intraoperative rupture of stage I ovarian cancer truly causes a worse outcome, and whether all these patients should receive adjuvant therapy.

In our two cases, we found that progression of tumor dissemination occurred after the intraoperative spillage of MCT with MT, favoring a worse prognosis in this cell type of ovarian germ cell tumor. Because there were severe dense adhesions between the tumors and the surrounding tissues, high staging of the tumors should be first impressed.

Adjuvant treatment after comprehensive staging and cytoreductive surgery poses another dilemma for clinicians managing patients with SCC arising in MCT [15]. The problem stems mainly from the rarity of this tumor and the small number of patients that have been reported in the literature. Optimal tumor debulking has been reported to be associated with a statistically significant improvement in survival [11,14]. Postoperative treatments reported in the literature included single-agent or combination chemotherapy, radiation therapy, or a combination of these modalities. Due to its rarity, a definitive or palliative therapy for SCC arising from a mature teratoma has not yet been established. In patients with advanced tumors, radiation therapy has been delivered alone after surgery [24,25], with inconsistent results and serious adverse events (e.g. radiation enteritis) [26]. Therefore, we used concurrent chemoradiation (cisplatin 50 mg weekly and radiation at 5,040 cGy for the entire pelvis) initially, followed by additional four-course adjuvant chemotherapy with a BEP regimen to manage the first case because the tumors were limited within the pelvic cavity. In the second patient, because of the more advanced metastases to the whole abdominal cavity and considering the possibility of significant morbidity when adding whole abdominal radiation, we only used multiagent chemotherapy for the second patient, but this treatment failed.

Multiagent chemotherapy has been delivered in advanced tumors, but with poor results [24]. It is noteworthy that some patients were treated using the BEP regimen, which is a standard for germ cell tumors, but it is probably misadapted to squamous cell histology [15]. Donadio et al suggested that chemotherapy for MT limited to a single cell type results in major responses and long-term survival in selected patients. Local therapy after chemotherapy is an important component of treatment to achieve maximum response [27]. The limited amount of reported experiences suggests that multimodal therapy, including aggressive tumor debulking followed by cisplatin-based combination chemotherapy or radiotherapy, is effective in this malignancy [15].

In conclusion, intraoperative rupture of MCT with MT results in rapid and widespread tumor dissemination that might worsen the prognosis of patients. So far, no standard treatment has been applied in this situation. We hope that future clinical trials will determine a better strategy to manage these types of patients.
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References