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Case Report

Squamous cell carcinoma development on the basis of mature cystic teratoma: importance of frozen section analysis

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Abstract: Background: Ovarian cancer is an important type of female genital tract cancer with an insidious course and is often diagnosed in advanced stages. In addition, there are many types of ovarian masses that are less likely to turn into malign cancer. A common type of lesion that we follow for benign reasons in the ovary is the mature cystic teratoma. These lesions rarely show malignant progression. Due to the possibility of malignant transformation, this possibility should not be ignored so as not to delay the diagnosis since once it turns malignant, a very serious and difficult process awaits the patients. Therefore, early diagnosis of these malignant masses is extremely important. We should not lose our skeptical attitude during follow-ups and in case of doubt, we can immediately initiate the necessary investigations. In this study, an exemplary case was discussed, and we aimed to contribute to our prediction about the malign transformation of mature cystic teratomas. Case: In our case, a 46-year-old patient, who had never given birth, did not have any additional disease, presented with the complaints of swelling in the abdomen, abdominal pain, metrorrhagia, and she was operated on with the diagnosis of pelvic mass. In the operation, a mass lesion of 30 cm in diameter with well-circumscribed solid and cystic areas with intact capsule integrity was observed in the right ovary. Frozen and final pathology results were reported as squamous cell carcinoma developing on the basis of ovarian teratoma. After the total surgery of the patient whose tumor capsule integrity was preserved, 6 adjuvant chemotherapy treatments were applied. With this timely and appropriate treatment, the treatment of the patient was completed as a cure and outpatient follow-up was possible. Conclusion: Early diagnosis of malignant ovarian tumors developing against the background of benign ovarian masses is life-saving for these patients.

Keywords: Perimenopausal, ovarian, mature cystic teratoma, squamous cell carcinoma

Introduction

Ovarian cancer is the third most common cancer of the female reproductive system. Ovarian cancer often develops de-novo. Germ cell tumors constitute 20% to 25% of all ovarian neoplasm, 95% of which are benign tumors [1]. It may contain mature structures from all 3 germinal layers (endoderm, ectoderm, and mesoderm). Ovarian masses are common lesions. Most are benign, but they can sometimes transform into malignant tissues. Long-standing benign lesions can sometimes transform into malignant masses, therefore, in the surgical evaluation of all ovarian masses, the possibility of malignancy should be excluded by frozen examination [2]. Mature cystic teratomas are a benign subtype of germ cell ovarian tumors and are the most common ovarian tumors in young women. The possibility of malignant transformation in some of these masses should be kept in mind, and older patients, patients with large tumors (over 10 cm), and patients with radiological signs of intra-tumor vascularization should be strongly examined against such possibility.

Although mature cystic teratomas show malignant transformation with a frequency of 0.17%-2%, 80% of them transform into squamous cell cancers. Approximately 10-17% of these tumors are detected bilaterally [3]. In our case, we detected bilateral teratomas and malignant transformation only on the right side [4]. Although patients mostly present with the complaint of swelling in the abdomen, they

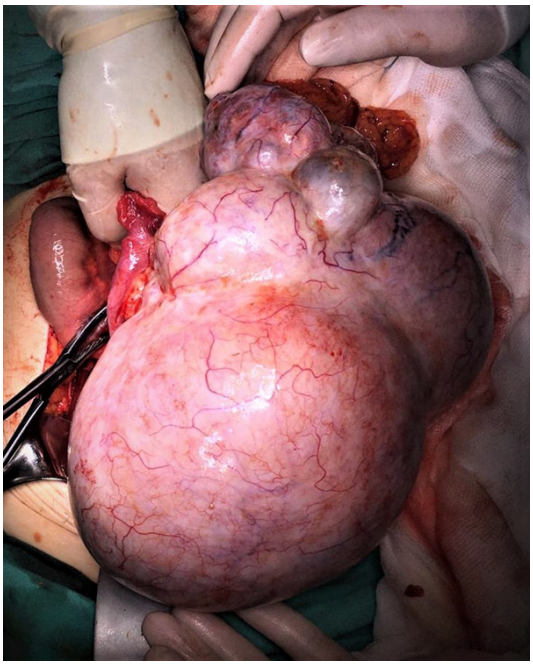

Figure 1. Intraoperative view of squamous cell ovarian carcinoma developing on the basis of teratoma.

sometimes present to the emergency service with the complaint of pain due to torsion. Risk factors for malignant transformation include older age, large tumor masses (above 10 cm), and radiological findings of intra-tumor vascularization, which should be approached carefully if present.

While observing teratomas enlarged tumor size, arising tumor marker levels, presenting with abdominal pain we can remember malign transformation of teratoma. Prognostic factors for ovarian carcinoma include capsular invasion, rupture, ascites, tumour dissemination, adhesions and additional tumour signs. The presence of nodular, papillary or cauliflower-like growths protruding into the cyst cavities or nodules or plaques within the cyst walls, particularly with areas of capsule penetration are also macroscopic indicators of malignancy [1].

Open surgery should be opted for the type of surgical approach. Although a minimally invasive route may seem attractive due to better patient recovery in these cases, some authors have highlighted that this procedure should be avoided due to the high risk of exfoliation and cystic effusion during laparoscopic manipulation and removal of the specimen [5, 6]. However, providing that laparoscopic approach is an option and shedding occurs, adequate peritoneal irrigation with heated fluids is highly recommended to prevent further peritoneal lesions from developing [7]. Also, recent studies have begun to show that minimally invasive surgery can be safely performed given that the sample is placed in an endoscopic retrieval bag [8].

During the operation frozen section is very important, and has a sensitivity of 65 to 100 percent and specificity of 99 percent [2, 4].

In the present study, we report a rare case of a woman in the perimenopausal period who was prediagnosed with benign teratoma in the preoperative evaluation and underwent staging surgery, whose frozen pathology results then revealed squamous cell carcinoma developing on the basis of ovarian teratoma, and we aimed to discuss our case in the light of the literature, keeping the importance of frozen section analysis in the foreground.

Case presentation

A 46-year-old nulliparous patient presented with complaints of abdominal distension and menorrhagia. The patient had a BMI of 22 with no systemic diseases. No significance was observed in patient's systemic and gynecological history. Physical examination revealed abdominal distension and a mobile solid palpating mass filling the pelvis. In the first test, the results were as follows; CA 12-5: 73 mg/dl, CA 19-9: 125 mg/dl, Hb: 9.4 g/dL. In the endoscopy, external pressure was detected on the cecum, and the Computed Tomography imaging of the abdomen revealed a solid mass with irregular appearance of 20×15×11 cm, which was thought to originate from the right ovary, filling the pelvis, extending to the sub-hepatic and umbilicus. A smooth-surfaced mass lesion of 5×3 cm compatible with teratoma was observed in the left ovary. It was decided to operate on the patient who did not have ascites in the abdomen with the preliminary diagnosis of bilateral adnexal mass and ovarian teratoma.

Exploration performed during laparotomy revealed a 15×14×10 cm mass with solid cystic content and irregular margins within the ovarian capsule in the right ovary. A 5×3 cm well-circumscribed solid cystic mass was observed in the left ovary (**Figure 1**).

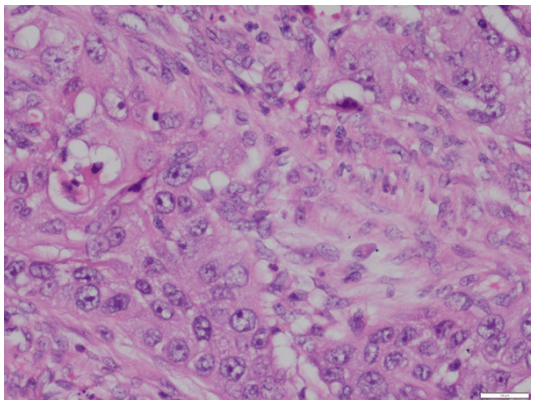

Figure 2. Histopathological image of squamous cell carcinoma in the background of mature cystic teratoma (H&E 40×).

Frozen section analysis showed the lesion mass in the right ovary as squamous cell carcinoma developing on the basis of ovarian teratoma and mature cystic teratoma in the left ovary (**Figure 2**). The case underwent total abdominal hysterectomy, bilateral pelvic and paraaortic lymph node dissection, omentectomy and cytology. No positive lymph node was detected. Classification was made as FIGO Stage 1A. The case was discussed in a multidisciplinary gynecological oncology council. Adjuvant treatment was planned and the case was referred to medical oncology. Six cycles of adjuvant chemotherapy treatment was applied including carboplatin-paclitaxel combination. No early or late complications occurred in the surgical and medical treatment. Post-treatment follow-up continues in remission.

Discussion

Mature cystic teratomas, the most common benign ovarian tumors in young women, have a probability of malignant transformation between 0.17% and 2%. These tumors, which are mostly detected in young women, should be followed up at later ages. In the follow-up, where malignant transformation mostly occurs in the 4th and 5th decades, typical findings such as significant ascites and abdominal swelling are not frequently detected. Patients at risk for ovarian cancer and patients in the perimenopausal period should be followed with great caution. The mean age at diagnosis is 53 (19-87), of which 72% are over 45 years old. Our case is 46 years of age and exhibits findings consistent with the literature.

Average tumor size is 14.8 cm (3.5-40 cm), and teratomas of 10 cm or larger should be approached with suspicion, as they generally tend to form large mass lesions.

Review of cases in the literature shows that patients' average tumor size was 10 cm and larger. Our case had bilateral ovarian teratoma, the largest of which was 20 cm, and squamous cell carcinoma was detected. We can say that the size of the mass may increase the possibility of malignancy compared to smaller teratomas in the other ovary.

Abdominal pain and palpable abdominal mass lesion are the two most common findings in patients, with a frequency of 47% and 26%, respectively. Approximately 50% of the cases were identified as stage I. In stage I patients, 5-year survival is 85%, which continues as 39%, 26%, and 0% in the following stages. A large-scale staging surgery is required as part of surgical treatment. In Stage Ia-Ic patients under 45 years of age, no significant difference was found in terms of survival time between fertility-sparing surgery and radical surgical treatment. In our case, malignancy was detected as revealed by the frozen section analysis and staging was done. Following, the diagnosis of stage 1A ovarian cancer was made according to the final pathology result, and adjuvant treatment was planned.

Although no consensus has been achieved on adjuvant therapy, platinum-based chemotherapy is thought to prolong patient lifespan.

In the retrospective study by Lisa et al. including 17 patients, lymph node positivity was not detected in any of the 10 patients who underwent lymph node dissection, in which the patients received adjuvant chemotherapy [9]. In our case, bilateral pelvic and para-aortic lymph node dissection was performed, and no tumor-positive lymph node was detected.

In another case, Noaya et al. presented a 51-year-old patient who underwent emergency surgery with the diagnosis of ovarian mass torsion reported as squamous cell carcinoma of ovary developing on the basis of mature cystic teratoma as shown by pathology results [10]. Pelvic and paraaortic lymph node metastases were detected in PET CT examination taken on the 112th day of postoperative follow-up. Fo-

llowing, staging and total lymphadenectomy were performed and the pathology was confirmed lymph node metastasis. The patient received 6 cures of carboplatin and paclitaxel adjuvant treatment. No recurrence was detected during the 2-year follow-up period. In our case, 6 cycles of carboplatin and paclitaxel chemotherapy treatment was applied to our patient, who is currently continuing the follow-ups without recurrence.

In mature cystic teratomas, the risk of malignant transformation must be considered. These rare malignant ovarian tumors, 50% of which are diagnosed in Stage I, exhibit a survival rate of 85% at this stage, in which early diagnosis bears great importance in terms of stage and survival of the patient. Radiotherapy is known to exert no effect on survival in adjuvant therapy, whereas Platinum-based chemotherapy is thought to prolong survival. In cases diagnosed as teratoma, a frozen section analysis should be performed, and malignant transformation should be excluded especially if the abovementioned risk factors are indicated. While the role of radiation therapy in adjuvant therapy is considered highly questionable, it is underlined that only alkylating agent-based therapy can improve survival [1].

Conclusion

In conclusion, it is of great importance to perform frozen analysis on bilateral and large-sized ovarian mature cystic teratomas prior to surgery operation by experienced pathologists in the field of gynecological oncology, and thus, it can be recommended that the operation be performed in experienced centers so as not to increase morbidity and mortality due to surgical staging.

Disclosure of conflict of interest

None.

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