

Squamous cell carcinoma arising in a mature cystic teratoma of the ovary in young patient with elevated carbohydrate antigen 19-9

D.T. Arioz¹, M.D.; C. Tokyol², M.D.; F.K. Sahin¹, M.D.; G. Koker¹, M.D.; S. Yilmaz³, M.D.; M. Yilmazer¹, M.D.; S. Ozalp⁴, M.D.

¹Department of Obstetrics and Gynecology, ²Department of Pathology,

³Department of Surgery, Faculty of Medicine, Afyon Kocatepe University, Afyonkarahisar;

⁴Department of Obstetrics and Gynecology, Faculty of Medicine, Eskisehir Osmangazi University, Eskisehir (Turkey)

Summary

Squamous cell carcinoma is the most common type of malignant transformation in mature cystic teratomas. It mainly affects postmenopausal women but is rarely seen in young patients. Carbohydrate antigen 19-9 (CA19-9) tumor marker is a high-molecular-weight glycoprotein, frequently elevated in gastrointestinal adenocarcinomas. CA19-9 levels can increase in both dermoid cysts and in malignant transformation of dermoid cysts. Herein we report a case of squamous cell carcinoma originating from a dermoid cyst in a 31-year-old, gravida 0, para 0, single woman with high levels of CA19-9 and normal levels of CEA. Preoperative CA19-9 was 1000 U/ml (normal range below 27 U/ml). The patient underwent unilateral salpingo-oophorectomy, omentectomy, appendectomy, pelvic and paraaortic lymphadenectomy. After the pathologic analysis of the material, the patient was categorized as FIGO Stage IIa due to metastasis to the left tube. She received six cycles of cisplatin and paclitaxel at 21-day intervals. The postoperative first day, second month, and sixth month CA19-9 values were 602 U/ml, 33.5 U/ml and 22.3 U/ml, respectively. She is now doing well without recurrence of disease six months after the surgery. Squamous cell carcinomas originating from dermoid cysts are rare tumors especially seen in elderly patients with high levels of tumor markers (like CEA, SCCA). Every case may not have the same characteristics and management should be individualized.

Key words: Squamous cell carcinoma; Mature cystic teratoma; Carbohydrate antigen 19-9 (CA19-9).

Introduction

Mature cystic teratomas, also known as dermoid cysts, are the most common ovarian tumors in women during reproductive years. Rarely does this type of tumor show malignant transformation (approximately 2% of cases) [1]. Any component may become malignant and squamous cell carcinoma is the most frequent type (80% of cases) of malignant transformation in dermoid cysts [1, 2]. Most of the patients are postmenopausal women and the mean age ranges from 51 to 55 years (minimum 21 and maximum 87 years old) [2-4].

Carbohydrate antigen 19-9 (CA19-9) tumor marker is a high-molecular-weight glycoprotein, frequently elevated in gastrointestinal adenocarcinomas. CA19-9 levels may also increase in dermoid cysts and in malignant transformation of dermoid cysts [5-7].

We report a case of squamous cell carcinoma originating from a dermoid cyst in a young patient with high levels of CA19-9.

Case report

A 31-year-old, gravida 0, para 0, single woman was referred to our clinic due to new onset of lower left quadrant abdominal pain. She had an approximately 10-cm left ovarian complicated cyst detected by abdominal ultrasonography (US). On physical examination she had a palpable mass in the lower quadrant. Pelvic/abdominal US and computerized tomography (CT) determined a 13 x 10 x 11-cm heterogeneous left ovarian cyst including calcific and oily structures without any papillary projections or ascites. Initial complete blood count, serum electrolytes, and liver and kidney function tests were normal. The preoperative CEA (carcinoembryonic antigen), AFP (alpha-fetoprotein) and hCG (human chorionic gonadotropin) levels were in the normal range but CA19-9 was 1000 U/ml (normal range below 27 U/ml) and CA 125 was 126 U/ml (normal range below 35 U/ml). We could not look for squamous cell carcinoma antigen (SCCA) because of technical difficulties in our laboratory. In light of the findings the patient was thought to have a mature cystic teratoma and underwent exploratory laparotomy.

During the operation, an irregularly shaped left ovarian mass 13 cm in diameter was seen. The mass was not adherent to the other pelvic structures. The uterus and the left ovary and the other intraabdominal organs were macroscopically normal. Left cystectomy and peritoneal washing were performed. The cyst contained sebaceous material, teeth, and hair. The serial cut section of the cyst revealed a solid area 9 cm in diameter. The intraoperative diagnosis was consistent with carcinoma, thus unilateral salpingo-oophorectomy, omentectomy, appendec-

Revised manuscript accepted for publication September 24, 2007

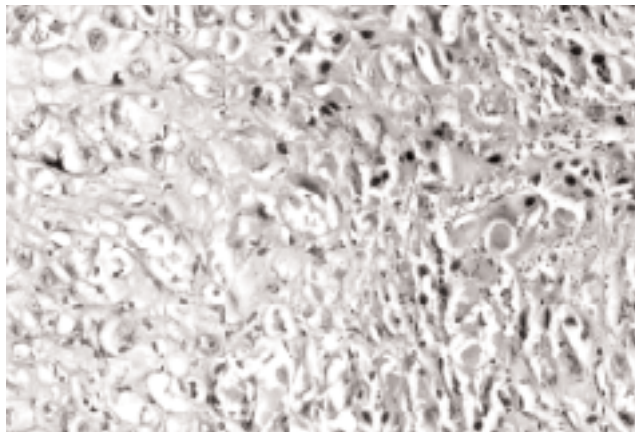


Fig. 1

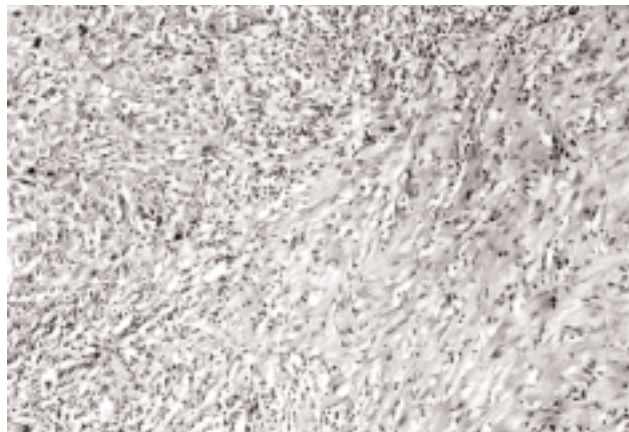


Fig. 2

Figure 1. — Moderately differentiated squamous cell carcinoma determined in the solid area of the mass (H&E x 200).

Figure 2. — Tumor infiltrating the muscular layer of the uterine tube (H&E x 200).

tomy, pelvic and paraaortic lymphadenectomy were performed. Biopsies were taken from suspicious peritoneal nodules. As the CA19-9 levels were increased and the frozen section diagnosis was malignant, an intraoperative gastroenterology consultation was done. Gastroscopy and rectosigmoidoscopy were performed and accepted as normal. Pathologic analysis of material revealed a dermoid cyst containing foci of moderately differentiated squamous cell carcinoma (Figure 1). The carcinoma appeared to have spread to the left tube (Figure 2). The cyst capsule was intact. All lymph nodes, peritoneal washings, the omentum and appendix were negative for cancer. Consequently, the patient was categorized as FIGO Stage IIa.

After the operation there were no complications. The postoperative first day, second month, and sixth month CA19-9 levels were 602 U/ml, 33.5 U/ml and 22.3 U/ml, respectively and CA 125 was 79 U/ml, 19.8 U/ml and 19.2 U/ml, respectively. The patient was treated with six cycles of combination chemotherapy consisting of 75 mg/m² cisplatin and 175 mg/m² paclitaxel at 21-day intervals. She is now doing well without any recurrence of disease six months after the surgery.

Discussion

Malignant transformations are extremely rare complications of mature cystic teratomas. Squamous cell carcinoma accounts for 80% of malignant transformations in dermoid cysts [1, 2]. Although germ cell tumors are seen in younger age groups this type of tumor is especially observed in older age [2-4]. Older age seems to be related with malignant transformation. Squamous cell carcinoma secondary to a dermoid cyst has very seldomly been seen in younger patients (10% in younger than 35 years) [2, 4].

Preoperative diagnosis of squamous cell carcinoma arising from a dermoid cyst is very difficult as it does not have specific symptoms. Only intraoperative diagnosis is possible for such cases. Researchers have worked on various tumor markers and clinical parameters. Kikkawa *et al.* stated that tumor size and patient age are important clinical factors in the differential diagnosis of squamous cell carcinoma from a dermoid cyst. They also studied the significance of SCCA and CEA and finally concluded that a good clinical strategy would be to examine SCCA

and CEA levels if the patient is over age 45 or if the tumor volume is greater than 99 mm in the greatest diameter [8].

The most useful tumor markers have been SCCA and CEA for squamous cell carcinoma arising in a dermoid cyst. Some authors explain that these markers are very important in detecting malignancy earlier and to follow postoperative recurrence [4, 8]. Unfortunately other tumor markers like CA19-9 and CA125 do not seem to have any place in clinical application and also CA19-9 has not been a useful screening marker due to a high positive rate in dermoid cysts [5, 8]. CA19-9 is frequently elevated in gastrointestinal adenocarcinomas such as the pancreas and could be increased in dermoid cysts and also squamous cell carcinoma of dermoid cysts [5-7].

In the literature, squamous cell carcinomas arising in a mature cystic teratoma are seen mainly in postmenopausal ages and generally together with tumor markers like CEA and SCCA. However our patient differs from cases in the literature as she was young, had a normal CEA level and very high CA19-9 level. The CA19-9 level normalized rapidly following surgical treatment in our patient. CA19-9 levels may be an important tumor marker indicating the effectivity of treatment in patients with high preoperative or pretreatment CA19-9 levels.

As our patient was a virgin and fertility was expected in the future, we performed full staging and left salpingo-oophorectomy although conservative surgical interventions have been defined for FIGO Stage Ia nulliparous women in the literature [4].

In conclusion, although having a standard approach for squamous cell carcinoma cases is an advantage for diagnosis and follow-up, it should be kept in mind that every case may not have the same standards and the management should be individualized.

References

- [1] Peterson W.F.: "Malignant degeneration of benign cystic teratomas of the ovary: a collective review of the literature". *Obstet. Gynecol.*, 1957, 12, 793.

- [2] Kikkawa F., Ishikawa H., Tamakoshi K., Nawa A., Suganuma N., Tomoda Y.: "Squamous cell carcinoma arising from mature cystic teratoma of the ovary: a clinicopathologic analysis". *Obstet. Gynecol.*, 1997, 89, 1017.
- [3] Pins M.R., Young R.H., Daly W.J., Scully R.E.: "Primary squamous cell carcinoma of the ovary. Report of 37 cases". *Am. J. Surg. Pathol.*, 1996, 20, 823.
- [4] Tseng C., Chou H., Huang K., Chang T., Liang C., Lai C. *et al.*: "Squamous cell carcinoma arising in mature cystic teratoma of the ovary". *Gynecol. Oncol.*, 1996, 63, 364.
- [5] Yoshioka T., Tanaka T.: "Immunohistochemical and molecular studies on malignant transformation in mature cystic teratoma of the ovary". *J. Obstet. Gynaecol. Res.*, 1998, 24, 83.
- [6] Micke O., Schafer U., Willich N.: "Persistent elevation of CA19-9 levels in a patient with an extended retroperitoneal dermoid". *Anti-cancer Res.*, 1999, 19, 2717.
- [7] Atabekoglu C., Bozaci E.A., Tezcan S.: "Elevated carbohydrate antigen 19-9 in a dermoid cyst". *Int. J. Gynaecol. Obstet.*, 2005, 91, 262.
- [8] Kikkawa F., Nawa A., Tamakoshi K., Ishikawa H., Kuzuya K., Suganuma N. *et al.*: "Diagnosis of squamous cell carcinoma arising from mature cystic teratoma of the ovary". *Cancer*, 1998, 82, 2249.

Address reprint requests to:
D.T. ARIOZ, M.D.
Dumlupinar Mah. Menderes Cad. Ozgurler
Apt. No: 8/7
03200/Afyonkarahisar (Turkey)
e-mail: drarioz@yahoo.com