Mucinous adenocarcinoma arising from the gastrointestinal epithelium in benign cystic teratoma of the ovary - Case report

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Summary

Benign cystic teratoma of the ovary (BCTO) is the most common ovarian germ cell tumor occurring predominantly in early adulthood. Malignant transformation of a BCTO is rare, with an incidence of 2%. Most benign cystic teratomas with malignant transformations are squamous cell carcinomas with just 6.8% being adenocarcinomas. We present a rare case of adenocarcinoma arising from the gastrointestinal epithelial elements of BCTO based on the microscopic examination and immunohistochemical studies. Adenocarcinoma arising from gastrointestinal epithelium within BCTOs is extremely rare. This is the fifth reported case of adenocarcinoma arising in gastrointestinal epithelium of a BCTO.

Key words: Benign cystic teratoma; Dermoid cyst; Malignant transformation; Mucinous adenocarcinoma; Ovarian tumor.

Introduction

Ovarian tumors reveal extremely varying histological patterns. Among them, benign cystic teratoma of the ovary (BCTO), frequently called a dermoid cyst, is seen with relatively high frequency and is claimed to account for approximately 15-20% of all ovarian tumors [1]. Malignant transformation of a benign cystic teratoma of the ovary is rare, accounting for only 2% of all benign cystic teratomas. Once malignant transformation occurs, it is most likely to be squamous cell carcinoma with the frequency of adenocarcinoma accounting for just 6-8% of them. We present an unusual case of adenocarcinoma arising from the gastrointestinal epithelium within a benign cystic teratoma. To the best of our knowledge, only four previous cases of adenocarcinoma arising in gastrointestinal epithelium of a BCTO have been reported in the English literature [2-5].

Case report

A 38-year-old non-smoking woman gravida 2, para 2, was referred to our hospital for a 6-month history of lower abdominal pain, constipation, and frequent urination. Her past medical history was unremarkable. She had no previous history of routine gynecologic examinations.

On physical examination, a 20 cm mobile and semisolid mass with regular contour was found in the right lower abdomen. The left adnexa was not easy to touch and examine due to the right ovarian mass. The large semisolid spherical mass arose from the pelvis and extended to 2-3 cm above the umbilicus. The external genitalia and vagina were normal. Due to the normal appearance of the cervix and normal Papanicolaou smear results at the referral hospital, we did not repeat the Papanicolaou smear at our hospital.

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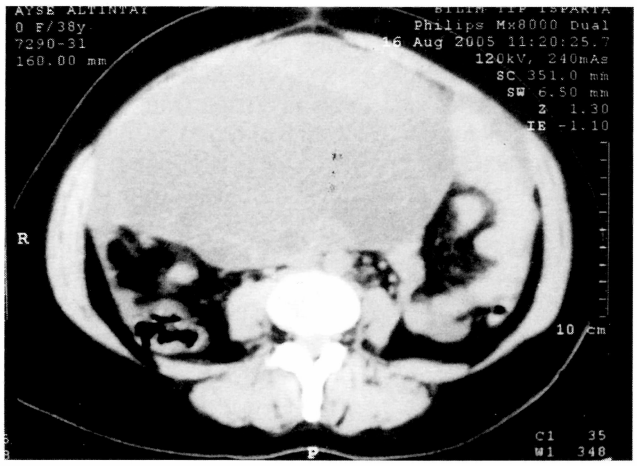
Pelvic and transvaginal sonography demostrated a complicated mass, with solid and cystic components. Chest X-ray and electrocardiogram were normal. Complete blood counts, serum electrolytes, and biochemical profile were within normal limits. Elevated levels of CA-125 (99.1 U/ml), and CA19-9 (> 1000 U/ml) were found. The values of CA15-3, CEA, alfa-fetoprotein, and β-hCG were within normal ranges. A computed tomography scan of the abdomen and pelvis with oral and intravenous contrast revealed a 20 x 12 x 20 cm complex right adnexal mass (Figure 1).

Colon and IVP studies were normal. After obtaining written informed consent, the patient was scheduled a for exploratory laparotomy and possible staging procedures. During the operation a 20 cm semisolid right adnexal mass arising from the right ovary was found. The uterus, contralateral ovary, other pelvic structures and the upper abdomen were all grossly normal. Right salpingo-oophorectomy was performed. Examination of frozen sections of the right adnexal mass revealed a mucinous adenocarcinoma arising from a benign cystic teratoma of the right ovary. Therefore, a staging procedure was performed including total abdominal hysterectomy, bilateral salpingo-oophorectomy, bilateral pelvic and paraaortic lymphadenectomy, infracolic omentectomy and multiple peritoneal and diaphragmatic biopsies. Pelvic and peritoneal washings that were obtained during the entry of the abdominal cavity were reported to be benign. The final pathologic diagnosis confirmed a moderately differentiated focal adenocarcinoma within the right benign cystic teratoma. All other specimens were benign. Based on these findings the patient was placed in FIGO Stage IA, grade 2, adenocarcinoma of the right ovary. The patient's postoperative course was satisfactory, and the CA-125 and CA19-9 levels returned to normal within four weeks of the surgery. She was discharged from the hospital on postoperative day 8.

Pathological findings

The main specimen consisted of a 22 x 16 x 12 cm cystic mass containing hair and keratinaceous debris. Histologic sections from the cyst wall disclosed a benign cystic teratoma that included ectodermal, mesodermal, and endodermal elements



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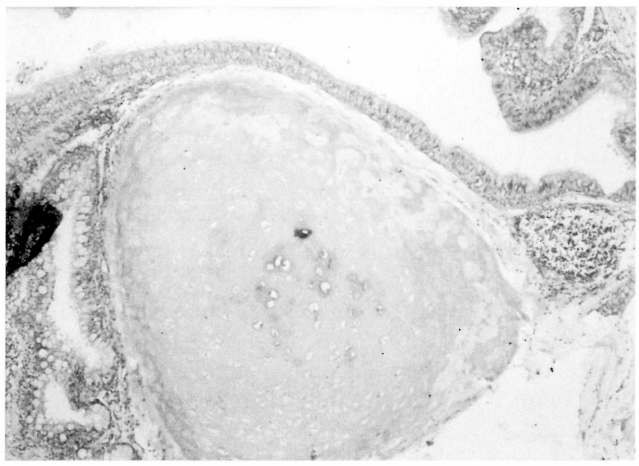

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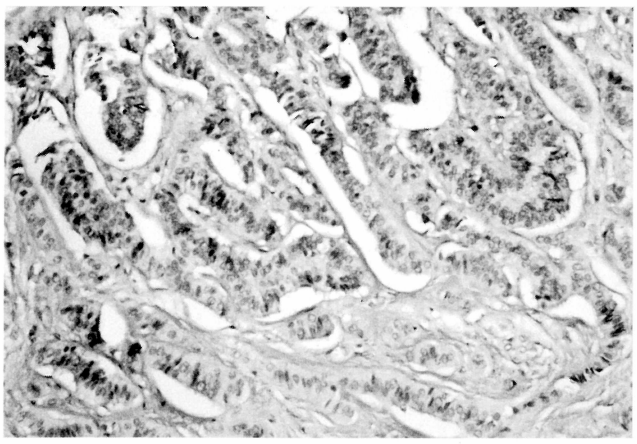

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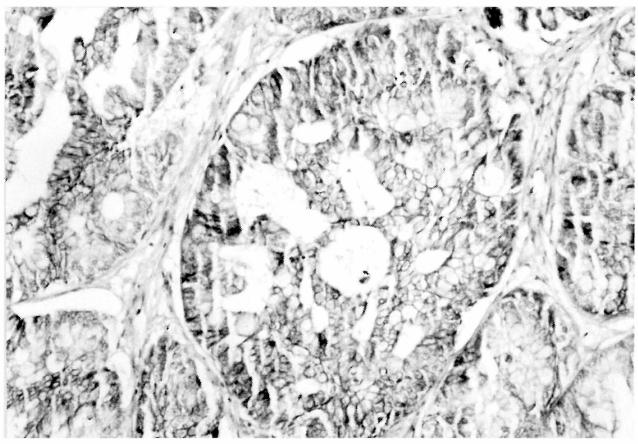

Fig. 4

Figure 1. — Computed tomography scan through the pelvis revealing a large complex right adnexal mass.
Figure 2. — Photomicrograph of the mature cystic teratoma involving the right ovary.
Figure 3. — High magnification of the adenocarcinomatous lesion. Enlargement of nuclei and nucleoli are seen in the atypical glandular structures (HE).
Figure 4. — Photomicrograph at high-power magnification demonstrating a strongly positive cytoceratin 20 immunohistochemical stain.

(Figure 2). Focally, the cystic cavity was lined by intestinal-type epithelium with moderate dysplasia. At high magnifications, the atypical glandular epithelial lesion showed moderate nuclear atypia (Figure 3). Nuclei were enlarged and irregularly shaped and contained coarse chromatin and large nucleoli. There was no lymphovascular space invasion appreciated. Immunohistochemistry staining for cytokeratin 20 was strongly positive supporting the diagnosis of gastrointestinal adenocarcinoma (Figure 4). The contralateral ovary was normal. Pelvic and paraaortic lymph nodes were all within normal limits.

Discussion

Benign cystic teratoma of the ovary is the most common ovarian teratoma as well as the most common ovarian germ cell neoplasm, accounting for 10-20% of all ovarian tumors. Teratomas can occur at any age, but the peak incidence is reported to be between 20 and 40 years of age. Preoperative diagnosis of BCTO is relatively easy due to radiological detection of bony tissue including teeth, bone, and cartilage. Intraoperative diagnosis of malignant tumors arising in these teratoma tissues is very difficult. A definitive diagnosis in such cases is most often rendered postoperatively [6]. Most cases of malignant transformation are detected between 30-70 years of age. A teratomatous cyst is predominantly lined by epidermis with skin appendages. The cystic lumen contains sebaceous materials and hair. In two-thirds of such cases, mature elements reflecting differentiation into tissues normally derived from all three embryonic germ layers are present [6]. Carcinoma may arise from any of the epithelial elements. The most important secondary tumor is squamous cell carcinoma (SCC), which is found in approximately 1% of BCTO and is the most common form of malignant transformation of BCTO. Adenocarcinoma arising from BCTO is extremely rare. To date, 45 cases have been reported in the literature [4]. In 1957, Peterson reviewed 15 adenocarcinomas and found that the histologic origins were from mammary, salivary, sebaceous, and thyroid gland epithelium, not gastrointestinal [7]. Since that report, there have been many reports of adenocarcinoma arising in BCTO, but only four cases showing gastrointestinal differentiation [2-5].

Our case was similar to the case reported by Fishman in that the patient was in her late 30s and the diameter of the pelvic mass was about 20 cm [3].

Preoperative diagnosis of malignant tumors arising in BCTO is very difficult. The ultimate diagnosis in these cases is made postoperatively. Kawai *et al.* studied seven tumor markers in ovarian tumors and reported that CA19-9 showed a high positive rate in mature cystic teratoma with malignant transformation [8]. In our case, the preoperative serum CA19-9 level was 1000 U/ml and the CA125 level was 99.1 U/ml. Both of these markers normalized after the operation. Kim *et al.* claimed that CA19-9 may be of use in monitoring patients with mucinous tumors [6]. On the other hand, it has also been reported that CA125 and CA19-9 are not useful for differentiating BCTO with malignant transformations from those without malignant transformations [9]. Immunohistochemistry can facilitate the prediction of the malignant transformation of the mature teratoma. In the literature, the CK20 positive (+)/CK7 negative (–) patterns are reported to be highly characteristic for tumors of gastrointestinal origin [10]. Our case was positive for CK20 while it was negative for CK7.

The poor prognostic factors for patients with malignant transformation of BCTO include cyst wall invasion, tumor dissemination, rupture, ascites, adhesions, and tumor types other than squamous carcinoma. Our patient showed mucinous adenocarcinoma as a poor prognostic factor.

Optimal management of mucinous cystadenocarcinoma arising in BCTO has not yet been established. However, because taxol with cisplatin or carboplatin combination chemotherapy is the regimen of choice in the postoperative management of ovarian epithelial cell carcinoma, such a combination chemotherapy could also be effective in these cases. For epithelial ovarian cancer not associated with BCTO, conservative treatment and no adjuvant therapy are appropriate for selected patients with Stage IA comprehensively staged disease. In our case with limited disease, withholding adjuvant therapy was deemed appropriate. For organ-confined adenocarcinomas arising in BCTO without surface involvement, adjuvant therapy may be appropriate for larger, poorly differentiated tumors with lymphovascular space invasion. In conclusion, we have presented an unusual case of a premenopausal woman who presented with low abdominal pain and a palpable pelvic mass due to gastrointestinal mucinous adenocarcinoma arising from one BCTO, with a brief review of the literature. To our knowledge, this case is the fifth presentation in the English literature of gastrointestinal adenocarcinoma arising in benign cystic teratoma of the ovary.

References

[1] Koonings P.P., Campbell K., Mishell D.R., Grimes D.A.: "Relative frequency of primary ovarian neoplasms: a 10-year review". *Obstet. Gynecol.*, 1989, *74,* 921.

[2] Ueda G., Fujita M., Ogawa H., Sawada M., Inoue M., Tanizawa O.: "Adenocarcinoma in a benign cystic teratoma of the ovary: report of a case with a long survival period". *Gynecol. Oncol.,* 1993, *48,* 259.

[3] Fishman A., Edelstein E., Altaras M., Beyth Y., Bernheim J.: "Adenocarcinoma arising from the gastrointestinal epithelium in benign cystic teratoma of the ovary". *Gynecol. Oncol.*, 1998, *70,* 418.

[4] Kushima M.: "Adenocarcinoma arising from mature cystic teratoma of the ovary". *Pathol. Int.*, 2004, *54,* 139.

[5] Levine A.D., Villella A.J., Poynor A.E., Soslow A.R.: "Gastrointestinal adenocarcinoma arising in a matur cystic teratoma of the ovary". *Gynecol. Oncol.,* 2004, *94,* 597.

[6] Kim S.M., Choi H.S., Byun J.S. *et al.*: "Mucinous adenocarcinoma and strumal carcinoid tumor arising in one mature cystic teratoma of the ovary with synchronous cervical cancer". *J. Obstet. Gynaecol. Res.*, 2002, *29,* 28.

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

[8] Kawai M., Kano T., Kikkawa F. *et al.*: "Seven tumor markers in benign and malignant germ cell tumors of the ovary". *Gynecol. Oncol.,* 1992, *45,* 248.

[9] Suzuki M., Tamura N., Kobayashi H., Ohwada M., Terao T., Sato I.: "Clinical significance of combined use of macrophage colony-stimulating factor and squamous cell carcinoma antigen as a selective diagnostic marker for squamous cell carcinoma arising in mature cystic teratoma of the ovary". *Gynecol. Oncol.,* 2000, *77,* 405.

[10] Chu P., Wu E., Weiss L.: "Cytokeratin 7 and Cytokeratin 20 expression in epithelial neoplasms: a survey of 435 cases". *Mod. Pathol.*, 2000, *13*, 962.

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