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Case Report

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MALIGNANT TRANSFORMATION OF MATURE CYSTIC TERATOMA OF THE OVARY: SQUAMOUS CELL CARCINOMA POSTMENOPAUSAL PATIENT

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Abstract

Mature cystic teratoma of the ovary is one of the most common benign ovarian germ cell tumors. Malignant transformation is rare and occurs predominantly in postmenopausal women, with squamous cell carcinoma being the most frequent histologic subtype. We report the case of a 50-year-old postmenopausal woman who presented with lower abdominal pain, abdominal distention, and weight loss. Transvaginal ultrasonography demonstrated a large right adnexal mass. Pelvic magnetic resonance imaging revealed a complex midline pelvic mass measuring approximately 14 × 11 × 10 cm, with cystic, fatty, and solid components, including peripheral papillary projections. The solid projections showed mild contrast enhancement and diffusion restriction. Tumor marker levels were elevated, including carcinoembryonic antigen and carbohydrate antigen 19-9. The patient underwent total abdominal hysterectomy with bilateral salpingo-oophorectomy and omentectomy, and partial bladder resection was required because of bladder invasion. Histopathological examination confirmed squamous cell carcinoma arising in a mature cystic teratoma. This case highlights the importance of recognizing suspicious radiologic features of malignant transformation in mature cystic teratoma, particularly in postmenopausal patients.

Keywords: *Mature cystic teratoma, Dermoid cyst, ovarian neoplasms, Squamous cell carcinoma, Magnetic resonance imaging.*

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Introduction

Mature cystic teratoma of the ovary is one of the most common benign ovarian neoplasms, especially in young women.[1] It is composed of tissues derived from at least two embryonic germ cell layers. Although usually benign, malignant transformation may occur in fewer than 2% of cases, most commonly in postmenopausal women.[2] Squamous cell carcinoma (SCC) is the most frequent histologic type of malignant transformation and is thought to arise from the ectodermal squamous epithelium of the teratoma.[2]

Imaging plays an important role in the preoperative evaluation of these tumors. Ultrasonography, computed tomography, and magnetic resonance imaging (MRI) may reveal typical features of mature cystic teratoma, including intralesional fat, Rokitansky protuberance, and the tip-of-the-iceberg sign. However, the presence of enhancing solid components, mural nodules, or papillary projections may raise suspicion for malignant transformation.[2,3] We present a case of SCC arising in a mature cystic teratoma in a postmenopausal woman, with radiologic and histopathologic correlation.

Case Report

A 50-year-old postmenopausal woman presented with lower abdominal pain, abdominal distention, and weight loss. Initial transvaginal ultrasonography revealed a large right adnexal mass. Pelvic MRI demonstrated a complex midline pelvic mass with solid and cystic components measuring approximately 14 × 11 × 10 cm. On sagittal images, the fat plane between the mass and the urinary bladder was obliterated. Multiple peripheral papillary solid projections were observed (Figure 1).

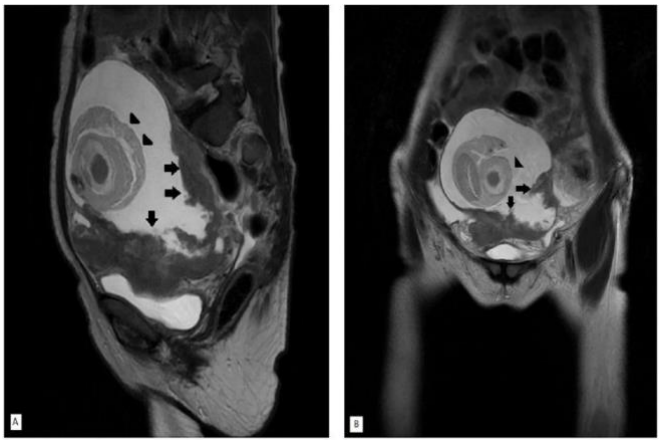


Figure 1. Sagittal (A) and coronal (B) T2-weighted magnetic resonance images showing a complex midline pelvic mass with solid and cystic components measuring approximately 14 × 11 × 10 cm. A central fatty component is present (arrowhead). Multiple peripheral papillary projections are seen (arrow), suggesting malignant transformation.

On fat-suppressed T2-weighted images, part of the lesion showed signal suppression, consistent with intralesional fat and supporting the diagnosis of mature cystic teratoma (Figure 2). The papillary solid projections showed mild enhancement on postcontrast T1-weighted images and diffusion restriction on diffusion-weighted imaging (DWI) (Figure 3).

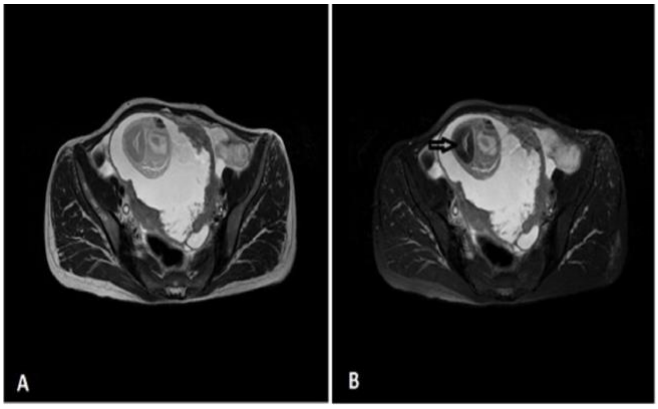


Figure 2. Axial T2-weighted non-fat-suppressed image (A) showing a complex solid-cystic pelvic mass. Axial fat-suppressed T2-weighted image (B) demonstrates signal suppression in part of the lesion (arrow), consistent with intralesional fat.

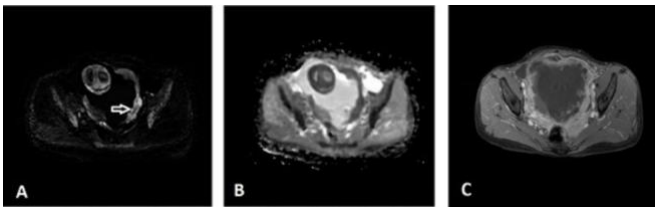


Figure 3. Diffusion-weighted image (A) shows high signal intensity in the papillary projections (arrow), while the apparent diffusion coefficient map (B) shows corresponding low signal intensity. Postcontrast T1-weighted image (C) demonstrates mild enhancement of these projections.

Tumor marker analysis revealed elevated carcinoembryonic antigen (CEA) (7.46) and carbohydrate antigen 19-9 (CA 19-9) (467) levels. Alpha-fetoprotein (AFP) was 1.69, cancer antigen 125 (CA 125) was 29.3, and cancer antigen 15-3 (CA 15-3) was 16.2. Based on the imaging and laboratory findings, malignant transformation within a mature cystic teratoma was suspected.

The patient underwent total abdominal hysterectomy with bilateral salpingo-oophorectomy and omentectomy. Intraoperatively, the mass was found to invade the bladder, necessitating partial bladder resection. Histopathological examination showed diffuse infiltration of the ovarian tissue by SCC arising in the background of a mature cystic teratoma (Figure 4).

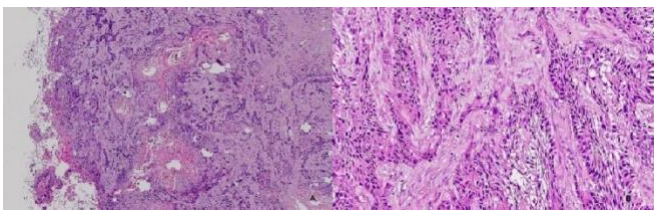


Figure 4. Histopathological examination showing ovarian tissue diffusely infiltrated by squamous cell carcinoma arising in a mature cystic teratoma (hematoxylin-eosin staining; A, ×40; B, ×400).

Discussion

Mature cystic teratoma accounts for approximately 10% to 20% of all ovarian neoplasms, whereas malignant transformation is rare, with a reported incidence of 0.17% to 2%.[4,5] Squamous cell carcinoma represents approximately 80% of malignant transformations and is typically seen in postmenopausal women.[2,4] Advanced age, large tumor size, and elevated tumor marker levels have been associated with an increased likelihood of malignant transformation.[5,6]

In the present case, the patient was postmenopausal and had a large adnexal mass with suspicious imaging findings. Magnetic resonance imaging demonstrated both fat-containing and solid components, and the papillary projections showed contrast enhancement and diffusion restriction. These features strongly suggested malignant transformation in a dermoid cyst. Similar radiologic findings, including enhancing solid portions, mural nodules, necrosis, and direct invasion of adjacent organs, have been described in previous reports.[2]

Preoperative diagnosis remains challenging because symptoms are usually nonspecific and tumor markers lack sufficient specificity.[5] Nevertheless, imaging findings may provide important clues. Ultrasonography is often the first-line imaging modality for adnexal masses, whereas MRI is particularly valuable for demonstrating fat and characterizing solid components.[7,8]

Surgery remains the primary treatment for SCC arising in mature cystic teratoma. Complete cytoreduction is considered important for prognosis, although the survival benefit of adjuvant therapy remains uncertain.[9] This case emphasizes that malignant transformation should be considered in postmenopausal patients with a large mature cystic teratoma showing enhancing solid components or local invasion on imaging.

Conflict of Interest

The authors have no conflicts of interest to disclose.

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Author Contributions

HU, MT; Conceptualization, case idea, drafting, final revision: BS; Material collection, preparation. Read and approved by all authors.

Ethical Statement

Written informed consent was obtained from the patient for publication of the clinical information and images. Patient confidentiality was protected throughout manuscript preparation.

References

1. Bhurgri Y, Shaheen Y, Kayani N, et al. Incidence, trends and morphology of ovarian cancer in Karachi (1995-2002). *Asian Pac J Cancer Prev*. 2011;12(6):1567-1571.
2. Kido A, Togashi K, Konishi I, et al. Dermoid cysts of the ovary with malignant transformation: MR appearance. *AJR Am J Roentgenol*. 1999;172(2):445-449. doi:10.2214/ajr.172.2.9930800
3. Kikkawa F, Nawa A, Tamakoshi K, et al. Diagnosis of squamous cell carcinoma arising from mature cystic teratoma of the ovary. *Cancer*. 1998;82(11):2249-2255. doi:10.1002/(SICI)1097-0142(19980601)82:11<2249::AID-CNCR21>3.0.CO;2-T
4. Mori Y, Nishii H, Takabe K, et al. Preoperative diagnosis of malignant transformation arising from mature cystic teratoma of the ovary. *Gynecol Oncol*. 2003;90(2):338-341. doi:10.1016/S0090-8258(03)00259-2
5. Atwi D, Kamal M, Quinton M, Hassell LA. Malignant transformation of mature cystic teratoma of the ovary. *J Obstet Gynaecol Res*. 2022;48(12):3068-3076. doi:10.1111/jog.15409
6. Chiang AJ, Chen MY, Weng CS, et al. Malignant transformation of ovarian mature cystic teratoma into squamous cell carcinoma: a Taiwanese Gynecologic Oncology Group study. *J Gynecol Oncol*. 2017;28(5). doi:10.3802/jgo.2017.28.e69
7. Gürel H, Gürel SA. Ovarian cystic teratoma with a pathognomonic appearance of multiple floating balls: a case report and investigation of common characteristics of the cases in the literature. *Fertil Steril*. 2008;90(5):2008.e17-2008.e29. doi:10.1016/j.fertnstert.2008.01.013
8. Patel MD, Feldstein VA, Lipson SD, Chen DC, Filly RA. Cystic teratomas of the ovary: diagnostic value of sonography. *AJR Am J Roentgenol*. 1998;171(4):1061-1065. doi:10.2214/ajr.171.4.9762997
9. Wu SY, Giannini A, Girardo M, et al. Malignant transformation of squamous cell carcinoma in mature cystic teratoma of the ovary: a systematic review and meta-analysis of data. *Gynecol Obstet Invest*. 2025;90(3):255-267. doi:10.1159/000542672.