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Unilateral Adult Type Granulosa Cell Tumor in Patient with Bilateral Mature Cystic Teratoma Treated with Fertility-Preserving Surgery: A Case Report

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Abstract Granulosa Cell Tumor (GCT) of the ovary is a rare, low-grade malignant neoplasm arising from sex cord-stromal cells, accounting for 2-5% of all malignant ovarian tumors. The coexistence of GCT with a mature cystic teratoma is extremely rare, with fewer than ten cases reported in the literature. These mixed tumors present diagnostic and therapeutic challenges due to their distinct origins and biological behavior. We report the case of a 37 year-old premenopausal woman (para one) who presented with acute left lower abdominal pain. Imaging revealed a large left adnexal mass measuring 9.25×8.80×5.90 cm with both solid and cystic components. Surgical management included left salpingo-oophorectomy and right ovarian cystectomy. Histopathological examination confirmed an adult-type granulosa cell tumor of the left ovary coexisting with bilateral mature cystic teratomas. No metastatic spread was observed. This case highlights the rare synchronous occurrence of adult-type granulosa cell tumor with bilateral mature cystic teratomas in a premenopausal woman. Given the indolent nature of GCT and the reproductive age of the patient, fertility-preserving surgery was successfully performed. Awareness of such rare combinations is critical for accurate diagnosis and individualized surgical planning.

Key Words Granulosa Cell Tumour, Teratoma, Fertility, Ovarian Tumours

INTRODUCTION

Granulosa Cell Tumor (GCT) of the ovary is a low-grade rare malignant tumor that accounts for nearly 2-5% of all malignant ovarian tumor cases. The tumor arises from sex-cord stromal cells and has a potential for recurrence and distant metastasis. The coexistence of GCT with teratoma is extremely rare, with less than ten cases reported in the literature [1]. The etiopathology of the mixed tumors is unclear, with different origins of each tumor type and different behavior. The concurrent existence of both neoplasms in a single ovary requires precise diagnosis and management due to various treatment modalities [2,3]. Furthermore, the juvenile type of GCT predominantly affects those aged <30 years, whereas the adult type predominantly affects post-menopausal women [4,5]. Rupture of GCT of the ovary is rare and the majority of cases presented with acute abdominal pain, haemoperitoneum and vaginal bleeding [6,7]. In premenopausal patients, GCT typically causes amenorrhea, irregular bleeding and infertility [8]. The best treatment option for GCT has not yet been established, with most cases treated with hysterectomy, bilateral salpingo- oophorectomy and omentectomy. These procedures are associated with deliberating consequences, particularly among young premenopausal females [9,10].

The synchronous presentation of GCT and teratoma in the same ovary is extremely rare. The majority of published case reports reported GCT of the ovary other than the one with teratoma. The indolent course of the disease and the rarity of the published literature highlighted the need to evaluate the management and outcomes of GCT and teratoma, particularly in premenopausal females [1,11]. Furthermore, adult-type GCT is usually diagnosed in perimenopausal women after 50 years of age and it is rarely reported beyond this age. The present study reports a case of 37 years old premenopausal female presented with a unilateral huge left adult-type GCT coexisted with bilateral mature cystic teratoma treated with fertility-preserving surgery.

Case presentation

A 37 year-old female patient who is para one presented to the emergency department with acute left abdominal pain.

Examination revealed mild tenderness in the left lower quadrant fossa. The patient was vitally stable and other systemic examinations were unremarkable. Radiological examination revealed a rounded left Huge adnexal mass with internal solid components and some cysts measuring approximately 9.25×8.80×5.90 cm. The right ovary was not well visualized and the cancer antigen (CA-125) was normal. The patient underwent left salpingo-oophorectomy and right ovarian cystectomy. No metastasis was found in the momentum or the pelvic lymph nodes.

Pathological Findings

The specimen consisted of a ruptured cyst measuring 12.0×9.5×4.5 cm in aggregate with an attached fallopian tube measuring 8.0×0.8 cm. There was a small intact cyst measuring 4.0×4.2 cm with 0.3 cm wall thickness. The cyst is filled with serous fluid mixed with hair and adipose tissue. Microscopically, both cysts showed skin and its appendages (sebaceous glands, hair follicles and sweat glands) and cartilage and were diagnosed as a mature cystic teratoma. The large cyst showed a mixture of diffuse, trabecular and insular tumor growth patterns. The tumor cells had scant cytoplasm and the nuclei were pale with frequent grooves. In the trabecular and insular arrangements, the tumor cells were separated by fibrothecomatous stroma. Call-Exner bodies were occasionally observed (Figure 1a-d).

Immunohistochemical (IHC) analysis of this tumor revealed positive staining for calretinin and inhibin and negative staining for synaptophysin and chromogranin. Special stain for Reticulin shows lack of pericellular staining and highlights nests or large groups of granulosa cells (Figure 2a-d). The histological findings and the IHC results support the diagnosis of adult-type GCT in mature cystic teratoma. The Cytology examination was negative and a Computed Tomography (CT) scan of the chest, abdomen and pelvis showed no evidence of metastasis. Subsequent follow-ups and workups revealed no evidence of disease recurrence three months after the initial diagnosis. The patient decided to continue follow up in different institute.

DISCUSSION

The coexistence of GCT and teratoma of the same ovary is extremely rare. Mature cystic teratomas of the ovary are mostly benign, with malignancy arising in nearly 2% of cases. Therefore, adequate surgical excision is considered curative, provided no immature component is identified. Paradoxically, GCT is locally malignant and associated with a higher risk of recurrence and metastasis. Hence, surgery, chemotherapy and radiotherapy may be needed [12,13]. The present study reports a case of 37 years old female presented with bilateral mature cystic teratoma and unilateral left

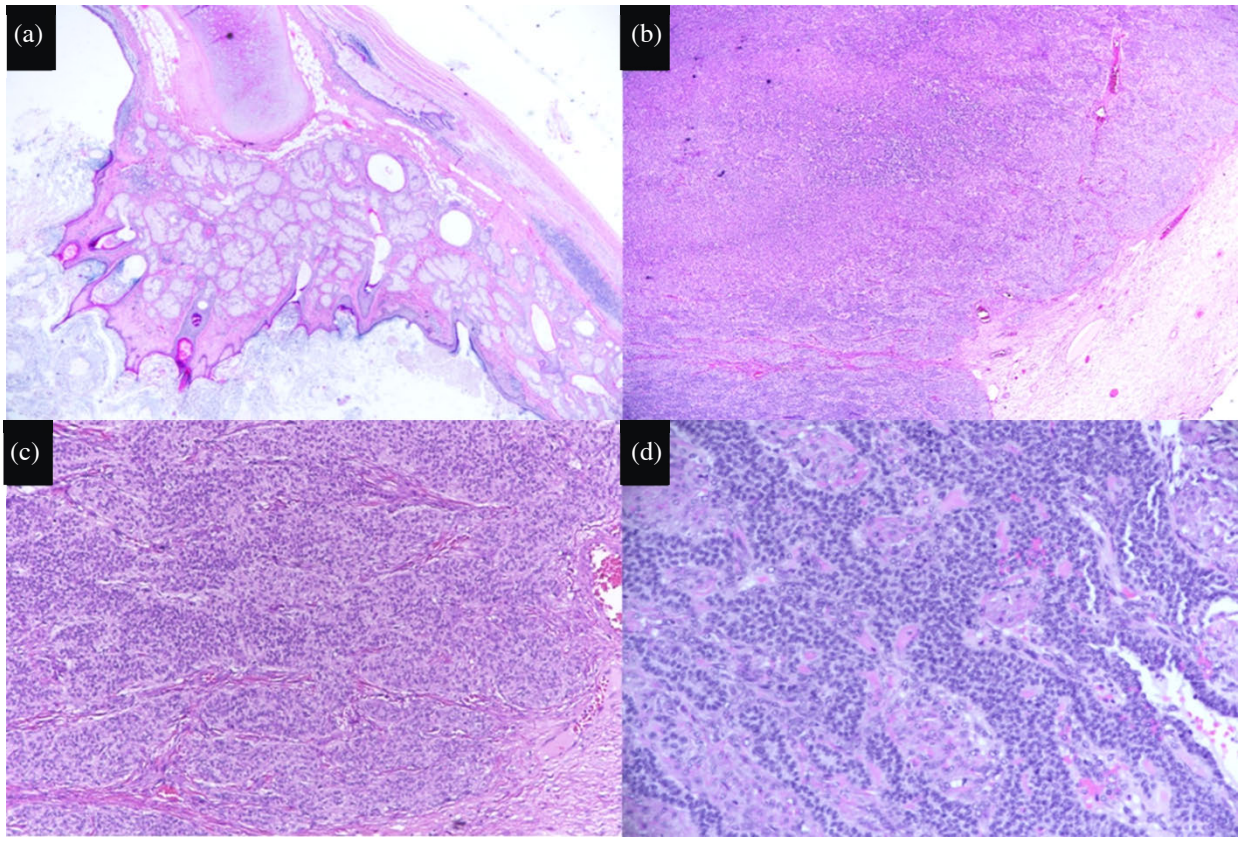

Figure 1(a-d): H&E stained Microscopic pictures of (a) Mature cyst teratoma, at ×2 magnification, (b) Granulosa cell tumor at ×2 magnification, (c) Granulosa cell tumor at ×10 magnification and (d) Granulosa cell tumor at ×20 magnification showing nuclear grooves

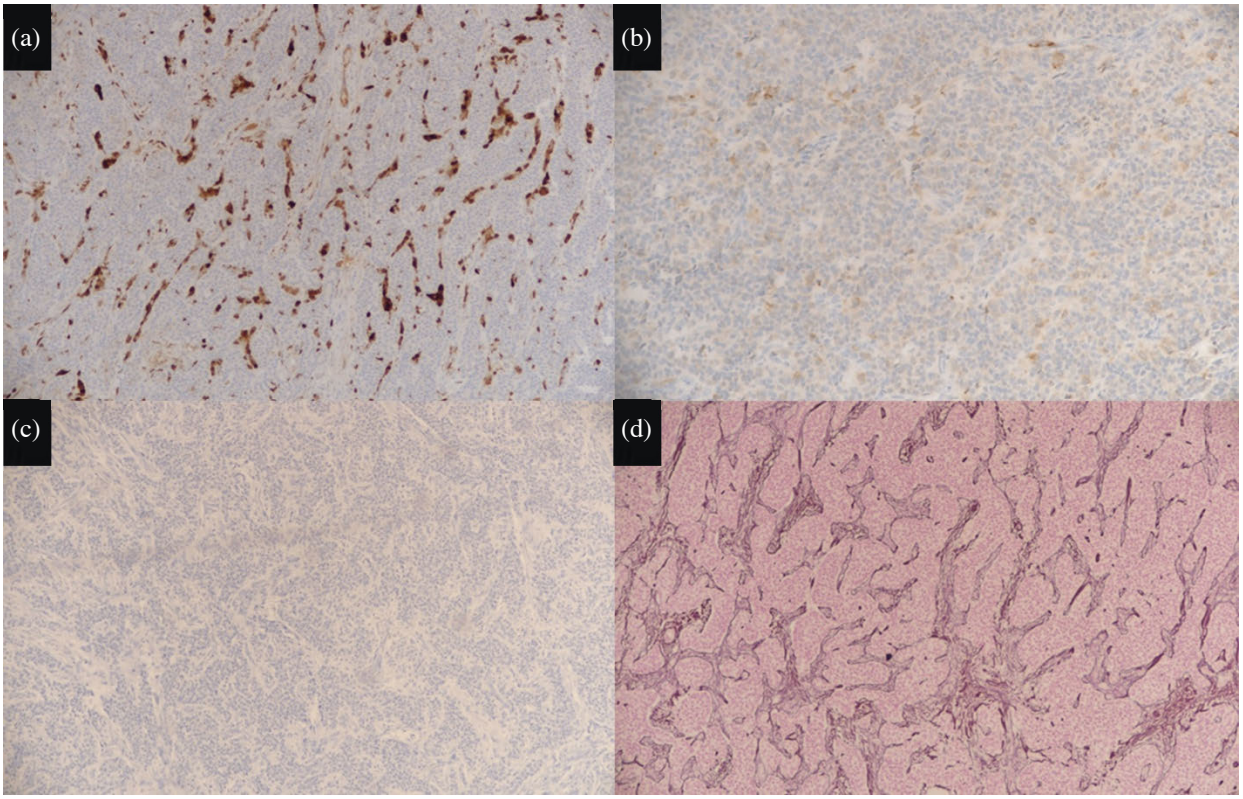

Figure 2(a-d): Immunohistochemical (IHC) and special stain analysis of this tumor, (a) Calretinin, (b) Inhibin, (c) Chromogranin and (d) Reticulin (special stain) shows lack of pericellular staining and highlights nests or large groups of granulosa cells

ovarian adult-type GCT [14]. The adult type of GCT mostly affects post-menopausal females aged 50 to 64 years; however, our patient is less than 40 years old. The younger age of the patient highlighted the need to preserve the reproductive function for which the patient underwent left salpingo-oophorectomy and right ovarian cystectomy. This was consistent with Nha *et al.* [15] who reported a case of a 24 year-old nulligravid female with bilateral coexistence of a granulosa cell tumor with a teratoma treated by fertility-preserving surgery [15]. However, long- term follow-up is required to maintain reproductivity and monitor the recurrence of the GCT.

The tumor mostly recurs within five years following diagnosis. Postoperative management is expected to maintain reproductivity and the patient may need hormonal replacement therapy and in vitro fertilization [16]. Meanwhile, patients with ovarian teratomatous neoplasms should be thoroughly evaluated for the association with additional histogenetically tumors that may compromise the patient's life. The association between GCT and teratoma of the ovary is not completely understood. The totipotency of tissues that compose the teratoma may give rise to secondary tumors. The GCT may be derived from epithelial and ovarian sex cord-stromal differentiation of the teratomatous neoplasms [17]. In this respect, the simultaneous occurrence of GCT and teratoma of the ovary may result from synchronous neoplastic transformation of ovarian epithelial and sex cord-stromal tissues.

Adult-type GCT of the ovary mostly carries a good prognosis. Alhusaini *et al.* [18] reported a five-year overall survival of 93% among patients with GCT. The recurrence was highly associated with elevated preoperative CA 125 levels and ascites [18]. Pham *et al.* [19] reported the significant impact of tumor size on the disease prognosis with 100 and 63% 10 year survival rates among patients with tumor size <5 cm and 5-15 cm, respectively [19]. The present study represents the first case of a young patient with bilateral mature cystic teratoma and coexisting unilateral ovarian adult-type GCT in Saudi Arabia. While the study highlighted the management and the outcomes of the disease, some limitations should be considered. The limited sample size underlined the need for further studies to evaluate the long-term aetiopathogenesis and outcomes of GCT and teratoma of the ovaries.

CONCLUSIONS

GCT should remain a differential diagnosis for patients presenting with acute abdominal pain with an underlying ovarian mass. The condition may coexist with teratoma of the ovary, affecting the teratomatous side or the other side or both. The mainstay management of the GCT is surgery, close monitoring and long-term follow-up.

REFERENCES

[1] Moid, Farah Y. and Robert V. Jones. "Granulosa cell tumor and mucinous cystadenoma arising in a mature cystic teratoma of the ovary: A unique case report and review of literature." Annals of Diagnostic Pathology, vol. 8, no. 2, April 2004, pp. 96-101. https://pubmed.ncbi.nlm.nih.gov/15060888/.

[2] Alayed, Abdullah M. *et al.* "Ovarian collision tumor, massive mucinous cystadenoma and benign mature cystic teratoma." *Cureus,* vol. 13, no. 7, June 2021. https://assets.cureus.com/uploads/case_report/pdf/58656/20210806-22430-1mhsbp4.pdf.

[3] Spencer, H.W. *et al.* "Granulosa-theca cell tumour of the ovaries. A late metastasizing tumour." *West Indian Medical Journal,* vol. 48, no. 1, March 1999, pp. 33-35. https://pubmed.ncbi.nlm.nih.gov/10375991/.

[4] Färkkilä, Anniina *et al.* "Pathogenesis and treatment of adult-type granulosa cell tumor of the ovary." *Annals of Medicine,* vol. 49, no. 5, March 2017, pp. 435-447. https://www.tandfonline.com/doi/full/10.1080/07853890.2017.1294760.

[5] Makhija, Amrita *et al.* "Retrospective analysis of 32 cases of ovarian granulosa cell tumours." *Journal of obstetrics and gynaecology of India* vol. 70, no. 1, February 2020, pp. 50-56. https://pubmed.ncbi.nlm.nih.gov/32030006/.

[6] Brooks, Sandra E. *et al.* "Ovarian cancer: a clinician's perspective." *AJSP: Reviews & Reports,* vol. 11, no. 1, January 2006, pp. 3-8. https://journals.lww.com/pathologycasereviews/fulltext/2006/01000/ovarian_cancer__a_clinician_s_perspective.2.aspx.

[7] Ukah, Cornelius O. *et al.* "Adult granulosa cell tumor associated with endometrial carcinoma: a case report." *Journal of Medical Case Reports,* vol. 5, no. 1, August 2011. https://link.springer.com/article/10.1186/1752-1947-5-340.

[8] Bryk, Saara *et al.* "Clinical characteristics and survival of patients with an adult-type ovarian granulosa cell tumor a 56-year single-center experience." *International Journal of Gynecological Cancer,* vol. 25, no. 1, January 2015, pp. 33-41. https://www.sciencedirect.com/science/article/pii/S1048891X24015433.

[9] Brewer, A.C. "Granulosa-cell Tumour of Ovary." *British Medical Journal,* vol. 1, no. 4540, January 1948. https://pmc.ncbi.nlm.nih.gov/articles/PMC2089674/.

[10] Kottarathil, Vijaykumar Dehannathparambil *et al.* "Recent advances in granulosa cell tumor ovary: a review." *Indian Journal of Surgical Oncology,* vol. 4, no. 1, December 2012, pp. 37-47. https://link.springer.com/article/10.1007/s13193-012-0201-z.

[11] Alhusaini, Hamed *et al.* "Adult-type ovarian granulosa cell tumour: treatment outcomes from a single-institution experience." *Cureus,* vol. 14, no. 11, March 2022. https://assets.cureus.com/uploads/original_article/pdf/118426/20221203-17425-4inndi.pdf.

[12] Tarca, Elena *et al.* "Diagnosis difficulties and minimally invasive treatment for ovarian masses in adolescents." *International Journal of Women's Health,* vol. 14, August 2022, pp. 1047-1057. https://www.tandfonline.com/doi/abs/10.2147/IJWH.S374444.

[13] Zhao, Dan *et al.* "Characteristics and treatment results of recurrence in adult-type granulosa cell tumor of ovary." *Journal of Ovarian Research,* vol. 13, no. 1, February 2020. https://link.springer.com/article/10.1186/s130 48-020-00619-6.

[14] Bryk, S., *et al.* "Incidence and occupational variation of ovarian granulosa cell tumours in finland, iceland, Norway and sweden during 1953-2012: A longitudinal cohort study." *BJOG: An International Journal of Obstetrics & Gynaecology,* vol. 124, no. 1, February 2016, pp. 143-149. http://dx.doi.org/10.1111/1471-0528.13949.

[15] Nha, Pham Ba *et al.* "Fertility-preserving surgery in a young nulligravid woman with bilateral coexistence of a granulosa cell tumor with a teratoma." *Case Reports in Obstetrics and Gynecology,* vol. 1, September 2023. https://onlinelibrary.wiley.com/doi/abs/10.1155/2023/9438575.

[16] Levin, Gabriel *et al.* "Granulosa cell tumor of ovary: A systematic review of recent evidence." *European Journal of Obstetrics & Gynecology and Reproductive Biology,* vol. 225, June 2018, pp. 57-61. https://www.sciencedirect.com/science/article/pii/S030121151830160X.

[17] Thompson, James P. *et al.* "Granulosa-cell carcinoma arising in a cystic teratoma of the ovary: report of a case." *Obstetrics & Gynecology,* vol. 28, no. 4, June 2025, pp. 549-552. https://journals.lww.com/greenjournal/citation/1966/10000/Granulosa_Cell_Carcinoma_Arising_in_a_Cystic.19.aspx.

[18] Alhusaini, Hamed *et al.* "Adult-type ovarian granulosa cell tumour: treatment outcomes from a single-institution experience." *Cureus,* vol. 14, no. 11, March 2022. https://assets.cureus.com/uploads/original_article/pdf/118426/20221203-17425-4inndi.pdf.

[19] Pham, Kong Chi *et al.* "Adult granulosa cell tumour of the ovary incidentally discovered during caesarean section in a pregnant patient after IVF: A rare case and a review of the literature." *Ecancer Medical Science,* vol. 17, January 2023. https://pmc.ncbi.nlm.nih.gov/articles/PMC9937067/.