



Ovarian Dysgerminoma in a Young Patient: Balancing Oncologic Safety and Fertility Preservation

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Abstract: Malignant ovarian tumors are traditionally classified into epithelial tumors, germ cell tumors, and sex cord-stromal tumors, with germ cell tumors accounting for approximately one-third of ovarian neoplasms (Berek & Hacker, 2015; Prat, 2014; Kurman et al., 2020). Germ cell tumors include dysgerminoma, yolk sac tumor, immature teratoma, and other less common histologic subtypes (Low et al., 2012; Talerman, 2007). Dysgerminomas represent nearly one-third of malignant germ cell tumors and predominantly affect young women under 30 years of age (Zaloudek & Norris, 1979; Mangili et al., 2018; Smith et al., 2020). Although rare – comprising 1-5% of all ovarian cancers –, they account for up to 30-40% of malignant germ cell neoplasms (Gershenson, 2007; Young, 2018). Their occurrence during reproductive years explains the occasional association with pregnancy, with incidence estimates ranging from 2.8 to 11 cases per 100,000 pregnancies (ACOG, 2016; ESUR, 2010). Clinically, dysgerminomas may present with pelvic pain, an abdominal mass, menstrual irregularities, or symptoms related to the compression of adjacent organs, although some patients remain asymptomatic until the tumor reaches a considerable size (Thomassin-Naggara et al., 2013; Ulbright, 2005). No consistent hereditary associations have been identified (McCluggage, 2006; WHO Editorial Board, 2020). Imaging plays a central role in initial evaluation, with transvaginal ultrasonography and Doppler as first-line modalities, typically revealing solid, multilobulated masses with heterogeneous echotexture and low-resistance vascular flow (ESUR, 2010; Thomassin-Naggara et al., 2013; Brown et al., 2014). MRI may further characterize tissue and disease extent, but a definitive diagnosis relies on histopathology, immunohistochemistry, and surgical staging (Ulbright, 2005; McCluggage, 2006; Kurman et al., 2014). Serum tumor markers such as LDH, AFP, and β -hCG assist in diagnosis, treatment monitoring, and recurrence detection (Gershenson, 2007; Park et al., 2017; Colombo et al., 2019). LDH elevation is particularly associated with dysgerminomas, while AFP and β -hCG elevations suggest mixed germ cell components (Kurman et al., 2014; Mangili et al., 2011). Additional markers such as inhibin and CA 125 may support differential diagnosis (Berek & Hacker, 2021; NCCN, 2023). For patients with high-risk features – bilateral tumors, capsular rupture, peritoneal metastases, or lymph node involvement – more extensive surgery may be required, including hysterectomy and bilateral salpingo-oophorectomy (Brown et al., 2014; Mangili et al., 2011; De la Motte Rouge et al., 2008). Platinum-based chemotherapy remains the cornerstone of adjuvant treatment and is associated with excellent survival outcomes even in advanced disease (Williams et al., 1984; Ray-Coquard et al., 2018; Williams et al., 2017). Dysgerminomas exhibit marked chemosensitivity, contributing to five-year survival rates exceeding 90% in early-stage disease (Chan et al., 2008; Droz et al., 2013; Zalewski et al., 2018). Fertility-sparing surgery has demonstrated oncologic safety, with 10-year survival rates above 90% (Morice et al., 2003; Mangili et al., 2018; Zhang et al., 2022). However, inadequate staging negatively impacts outcomes (De la Motte Rouge et al., 2008; Park et al., 2017; Alwazzan et al., 2018). This case illustrates the diagnostic and therapeutic challenges in managing ovarian dysgerminoma in a young patient, emphasizing early diagnosis, adequate staging,

multidisciplinary care, and individualized treatment planning (NCCN, 2024; ESMO-EURACAN, 2019; Gershenson, 2023).

Keywords: ovarian, DYSGERMINOMA, surgical oncology, gynecological

INTRODUCTION

Malignant ovarian tumors are traditionally classified into epithelial tumors, germ cell tumors, and sex cord-stromal tumors, with germ cell tumors accounting for approximately one third of ovarian neoplasms (Berek & Hacker, 2015; Prat, 2014; Kurman et al., 2020). Germ cell tumors include dysgerminoma, yolk sac tumor, immature teratoma, and other less common histologic subtypes (Low et al., 2012; Talerman, 2007). Dysgerminomas represent nearly one third of malignant germ cell tumors and predominantly affect young women under 30 years of age (Zaloudek & Norris, 1979; Mangili et al., 2018; Smith et al., 2020). Although rare – comprising 1-5% of all ovarian cancers –, they account for up to 30-40% of malignant germ cell neoplasms (Gershenson, 2007; Young, 2018). Their occurrence during reproductive years explains the occasional association with pregnancy, with incidence estimates ranging from 2.8 to 11 cases per 100,000 pregnancies (ACOG, 2016; ESUR, 2010).

Clinically, dysgerminomas may present with pelvic pain, abdominal mass, menstrual irregularities, or symptoms related to the compression of adjacent organs, although some patients remain asymptomatic until the tumor reaches a considerable size (Thomassin-Naggara et al., 2013; Ulbright, 2005). No consistent hereditary associations have been identified (McCluggage, 2006; WHO Editorial Board, 2020). Imaging plays a central role in initial evaluation, with transvaginal ultrasonography and Doppler as first-line modalities, typically revealing solid, multilobulated masses with heterogeneous echotexture and low-resistance vascular flow (ESUR, 2010; Thomassin-Naggara et al., 2013; Brown et al., 2014). MRI may further characterize tissue and disease extent, but a definitive diagnosis relies on histopathology, immunohistochemistry, and surgical staging (Ulbright, 2005; McCluggage, 2006; Kurman et al., 2014).

Serum tumor markers such as LDH, AFP, and beta-hCG assist in diagnosis, treatment monitoring, and recurrence detection (Gershenson, 2007; Park et al., 2017; Colombo et al., 2019). LDH elevation is particularly associated with dysgerminomas, while AFP and beta-hCG elevations suggest mixed germ cell components (Kurman et al., 2014; Mangili et al., 2011). Additional markers such as inhibin and CA 125 may support differential diagnosis (Berek & Hacker, 2021; NCCN, 2023). For patients with high-risk features – bilateral tumors, capsular rupture, peritoneal metastases, or lymph node involvement – more extensive surgery may be required, including hysterectomy and bilateral salpingo-oophorectomy (Brown et al., 2014; Mangili et al., 2011; De la Motte Rouge et al., 2008).

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CASE REPORT

Medical History

A 20-year-old white female presented to the emergency department at Amador Aguiar Maternity Hospital reporting pelvic heaviness and hypogastric pain for four days. She denied fever, bowel, or urinary symptoms. She had previously undergone imaging at a non-specialized emergency department. Her medical history included well-controlled asthmatic bronchitis, no smoking or alcohol use, and no prior surgeries. She had one previous vaginal delivery and regular gynecologic follow-up, including the identification of a right ovarian cyst one year earlier.

Physical Examination

The patient was in good general condition, normotensive, hydrated, and without acute distress. Abdominal examination revealed mild distension and a firm, irregular mass of approximately 12 cm in the hypogastrium and right iliac fossa. Gynecologic examination showed a fibroelastic cervix and a lobulated mass in the right adnexa an ovarian tumor of probable neoplastic origin was suspected.

Laboratory Findings

Laboratory tests revealed markedly elevated LDH (4,032 ng/mL), \beta-hCG (132.5 mIU/mL), AFP (166 ng/mL), CA 125 (116 ng/mL), and CA 19-9 (45 ng/mL), consistent with germ cell tumor activity. Other test results were normal.

Tab 1: Data obtained through medical record review

Tests	Patient results	Normal range
B-hCG	132.5 mUI/ml	Less than 5 mUI/ ml
Lactic dehydrogenase (LDH)	4032 ng/ml	120-246 ng/ml
Alpha-fetoprotein (afp)	166 ng/ml	Up to 8.78 ng/ml
CA 19.9	45 ng/ml	Up to 37 ng/ml
CA 125	116 ng/ml	Up to 35 ng/ml
CEA	1.38	Up to 5 ng/ml

Imaging Studies

One year before admission, transvaginal ultrasonography demonstrated a well-defined nodular lesion measuring 3.0 x 2.4 x 2.1 cm in the right ovary. Computed tomography

performed at an outside institution revealed a heterogeneous pelvic mass with partially defined margins measuring 15.3 x 11.0 x 10.6 cm, corresponding to an estimated volume of 927.6 cm³.

Transvaginal Doppler ultrasonography demonstrated a large solid right adnexal mass with lobulated contours and heterogeneous, predominantly hyperechoic content, without evident calcifications. The lesion measured approximately 16.4 x 10.3 x 3.2 cm, with an estimated volume of 281.0 cm³. Doppler evaluation demonstrated vascular flow in both peripheral and central vessels. Chest radiography showed no abnormalities.

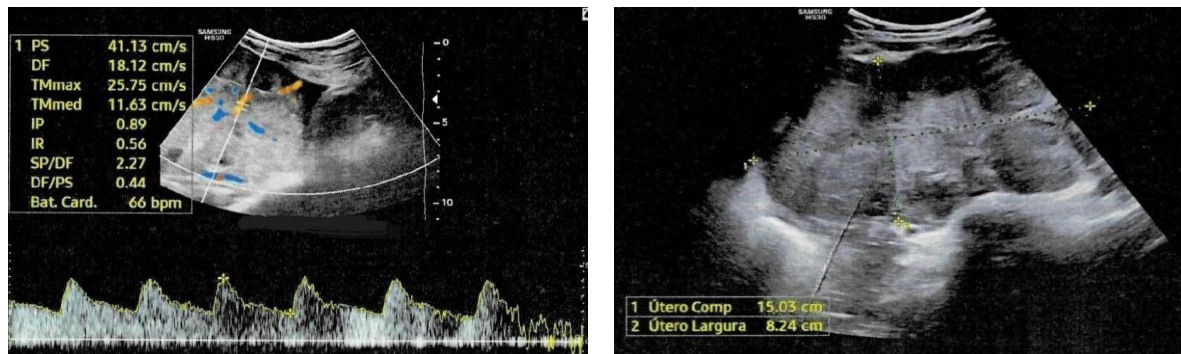


Figure 1 & 2: Transvaginal Doppler ultrasonography.

Surgical Management

Exploratory laparotomy revealed a bulky right adnexal mass, peritoneal and bladder implants, and para-aortic lymphadenopathy. The patient underwent total hysterectomy, right salpingo-oophorectomy, partial omentectomy, and excision of bladder implants.



Figure 3: Surgical specimens obtained after cytoreductive surgery.

Postoperative Course

The patient recovered well, resumed bowel function on postoperative day two, and was discharged without complications. Adjuvant chemotherapy was administered with cisplatin

and etoposide (20 cycles). Later, new pelvic and para-aortic implants required a second surgery. Radiotherapy was not recommended.

Ethical Considerations

Patient's consent was formally obtained.

DISCUSSION

Dysgerminomas are rare but highly curable malignancies affecting young women, with an excellent prognosis when appropriately treated (Mangili et al., 2018; Gershenson, 2023; Young, 2018). Imaging findings and tumor markers are essential for diagnosis, but histopathology remains the gold standard (Ulbright, 2005; McCluggage, 2006; Kurman et al., 2014). Surgical staging is critical, as inadequate staging worsens outcomes (De la Motte Rouge et al., 2008; Zhang et al., 2022; Alwazzan et al., 2018). Platinum-based chemotherapy is highly effective, even in advanced disease or recurrence (Williams et al., 1984; Ray-Coquard et al., 2018; Williams et al., 2017).

Fertility-sparing surgery is safe in selected patients, with long-term survival exceeding 90% (Morice et al., 2003; Mangili et al., 2011; Park et al., 2017). However, extensive disease may require radical surgery, as in this case (Brown et al., 2014; Talerman, 2007). Germ cell tumors have cure rates exceeding 90% even in advanced stages (Williams et al., 1984; Chan et al., 2008; Droz et al., 2013). This case highlights the importance of early diagnosis, multidisciplinary management, and individualized treatment planning, especially when fertility preservation is a concern (NCCN, 2024; ESMO-EURACAN, 2019; Gershenson, 2023).

CONCLUSION

Ovarian dysgerminoma is a rare but highly treatable malignancy with excellent long-term outcomes. Early recognition, accurate staging, and multimodal treatment are essential. This case underscores the need for individualized management strategies, especially in young women where fertility preservation is relevant (Mangili et al., 2018; Gershenson, 2023; Young, 2018).

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REFERENCES

1. BEREK, Jonathan S.; HACKER, Neville F. Berek & Hacker's gynecologic oncology. 6. ed. Philadelphia: Wolters Kluwer, 2015.

2. PRAT, Jaime (Ed.). WHO classification of tumours of female reproductive organs. 4. ed. Lyon: IARC, 2014. (World Health Organization Classification of Tumours, v. 6).
3. KURMAN, Robert J. et al. WHO classification of tumours of female reproductive organs. 5. ed. Lyon: IARC, 2020.
4. LOW, Jennifer J. H. et al. Ovarian germ cell tumours. Best Practice & Research Clinical Obstetrics & Gynaecology, London, v. 26, n. 3, p. 347-355, 2012.
5. MANGILI, Giorgia et al. Germ cell tumors of the ovary. Critical Reviews in Oncology/Hematology, Amsterdam, v. 125, p. 1-12, 2018.
6. ZALOUDEK, Christopher; NORRIS, H. J. Dysgerminoma of the ovary: a clinicopathologic study of 67 cases. Cancer, New York, v. 44, n. 2, p. 819-828, 1979.
7. WILLIAMS, Steven D. et al. Treatment of ovarian germ cell tumors with cisplatin, etoposide, and bleomycin (BEP). Journal of Clinical Oncology, Alexandria, v. 2, n. 6, p. 689-695, 1984.
8. MORICE, Philippe et al. Fertility results after conservative treatment of ovarian malignant germ cell tumors. Human Reproduction, Oxford, v. 18, n. 12, p. 2646-2652, 2003.
9. NATIONAL COMPREHENSIVE CANCER NETWORK (NCCN). NCCN clinical practice guidelines in oncology: ovarian cancer including fallopian tube cancer and primary peritoneal cancer. Version current. Plymouth Meeting, PA: NCCN, 2024.
10. SOCIEDADE BRASILEIRA DE ONCOLOGIA CLÍNICA. Diretrizes de tratamentos oncológicos recomendados pela Sociedade Brasileira de Oncologia Clínica: Ovário: tumores germinativos. 2022. 19 p. Disponível em: <https://app.sboc.org.br/wp-content/uploads/2022/10/file-46.pdf>. Acesso em: 1 fev. 2024.
11. COLOMBO, Nicoletta et al. ESMO-EURACAN clinical practice guidelines for diagnosis, treatment and follow-up of ovarian cancer. Annals of Oncology, Oxford, v. 30, n. 5, p. 672-705, 2019.
12. WHO Classification of Tumours Editorial Board. Female Genital Tumours. 5th ed. Lyon: IARC; 2020.
13. BEREK JS, HACKER NF. Berek & Hacker's Gynecologic Oncology. 7th ed. Wolters Kluwer; 2021.
14. SMITH HO et al. Ovarian germ cell tumors: epidemiology and clinical behavior. Obstetrics and Gynecology Clinics of North America. 2020.
15. ACOG. American College of Obstetricians and Gynecologists. ACOG Practice Bulletin No. 174. Evaluation and Management of Adnexal Masses. Obstet Gynecol. 2016.
16. ESUR guidelines for ovarian/adnexal masses: an imaging approach. European Radiology. 2010;20(1):25-35.
17. THOMASSIN-NAGGARA I et al. Adnexal masses: development and preliminary validation of an MR imaging scoring system. Radiology. 2013
18. TALERMAN A. Germ cell tumors of the ovary. Gynecologic Oncology. 2007.
19. KURMAN RJ, Carcangiu ML, Herrington CS, Young RH. WHO Classification of Tumours of Female Reproductive Organs. 4th ed. IARC; 2014.
20. GERSHENSON DM. Management of ovarian germ cell tumors. J Clin Oncol. 2007.
21. PARK JY et al. Prognostic factors and outcomes of ovarian germ cell tumors. Annals of Oncology. 2017.
22. MCCLUGGAGE WG. Immunohistochemistry in the distinction between ovarian germ cell tumors and other neoplasms. Histopathology. 2006.

23. YOUNG RH. Ovarian germ cell tumors: a review. *Modern Pathology*. 2018.
24. ULBRIGHT TM. Germ cell tumors of the gonads: a selective review. *Modern Pathology*. 2005.
25. NATIONAL COMPREHENSIVE CANCER NETWORK. NCCN Clinical Practice Guidelines in Oncology - Ovarian Cancer. 2023.
26. RAY-COQUARD I et al. Non-epithelial ovarian cancer: ESMO Clinical Practice Guidelines. *Annals of Oncology*. 2018.
27. WILLIAMS SD et al. Treatment of germ cell tumors with BEP regimen. *Journal of Clinical Oncology*. 2017.
28. BROWN J et al. Surgical management of ovarian germ cell tumors. *Gynecologic Oncology*. 2014.
29. DU BOIS A et al. Ovarian germ cell tumors: Evolving management strategies. *International Journal of Gynecological Cancer*. 2020.
30. MANGILI G et al. Treatment and outcome of malignant ovarian germ cell tumors. *Gynecologic Oncology*. 2011.
31. DE LA MOTTE ROUGE T et al. Prognostic factors in ovarian germ cell tumors. *European Journal of Cancer*. 2008.
32. DROZ JP et al. Ovarian germ cell tumors: ESMO Clinical Recommendations. *Annals of Oncology*. 2013.
33. CHAN JK et al. Prognostic factors and survival in ovarian germ cell tumors. *Journal of Clinical Oncology*. 2008.
34. ZALEWSKI K et al. Treatment outcomes of ovarian germ cell tumors. *Oncology Letters*. 2018
35. ZHANG X et al. Oncology and reproductive outcomes of malignant ovarian germ cell tumors. 2022.
36. ALWAZZAN AB et al. Pattern of care and survival outcomes in malignant ovarian germ cell tumors, 2018.
37. NATIONAL CANCER INSTITUTE. PDQ Ovarian Germ Cell Tumors Treatment. 2023.
38. GERSHENSON DM. Ovarian germ cell tumors: recent advances. 2023.