Clinical and ultrasound features of non-gestational ovarian choriocarcinoma

A 27-year-old woman with a previous right oophorectomy for dysgerminoma diagnosed 9 years earlier, was referred to our center after the incidental finding of a left ovarian mass and increased beta-human chorionic gonadotropin (β-hCG) levels (22 000 IU/mL). On ultrasound examination, a solid lesion of 34 × 23 × 38 mm in size was detected in the left ovary, appearing as a mass with inhomogeneous echotexture, irregular contour and no stripy echogenicity (Figure 1a and Videoclip S1). An ovarian crescent sign was visualized clearly at the lateral

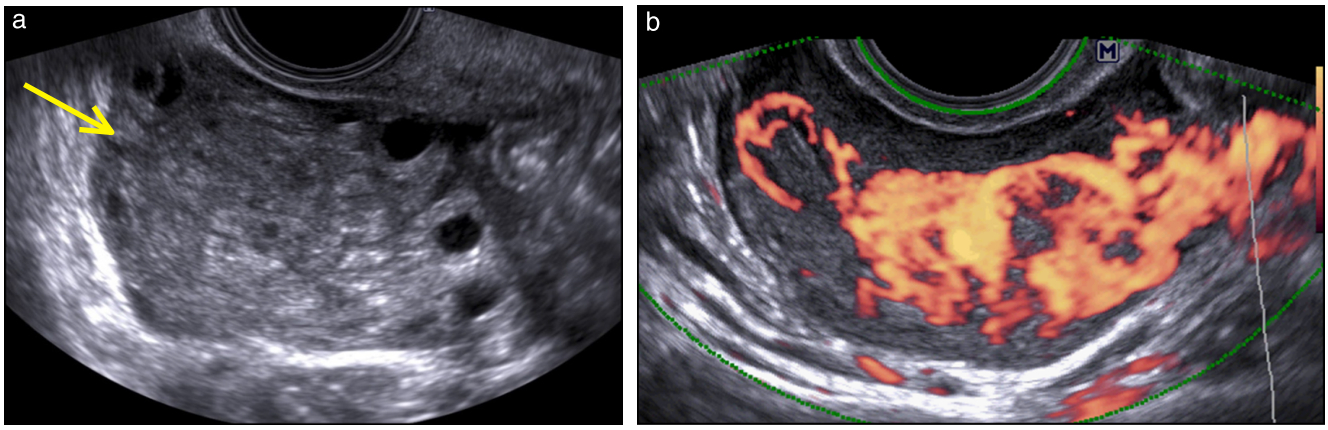

Figure 1 Grayscale (a) and power Doppler (b) ultrasound images showing highly vascularized solid ovarian mass with inhomogeneous echotexture and ovarian crescent sign (arrow).

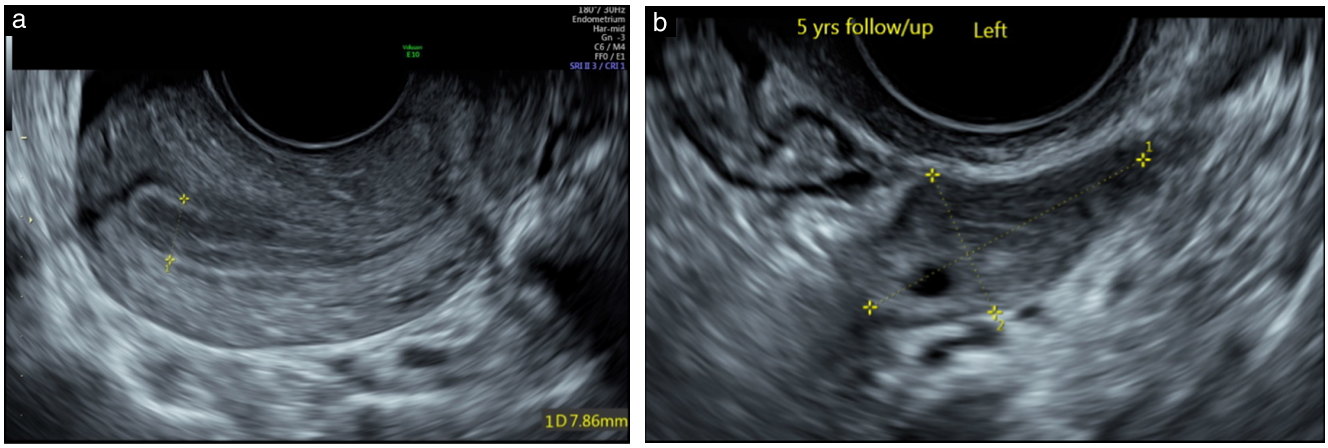

Figure 2 Grayscale ultrasound images at 5-year follow-up after fertility-sparing surgery for non-gestational choriocarcinoma, showing homogeneous endometrial thickness consistent with phase of menstrual cycle (a) and normal left ovary (b).

part of the mass. On power Doppler examination, rich vascularization was detected within the ovarian lesion (Figure 1b and Videoclip S2). No ascites was present.

Based on personal history, ultrasound features and β-hCG levels, the first diagnostic suggestion was recurrence of dysgerminoma[1] or another type of germ-cell tumor[2]. However, other diagnostic hypotheses could not be excluded, such as a different type of ovarian malignancy or, due to the presence of the ovarian crescent sign, benign pathology. Considering the suspicion of a germ-cell tumor, which typically responds well to chemotherapy[3], fertility-sparing surgery was offered to the patient.

On open laparoscopy, the surgeon confirmed the presence of a solid tumor with a visible portion of normal ovarian parenchyma in the left adnexal region, and proceeded with enucleation of the solid mass. On macroscopy, the solid lesion, which was 4 cm in diameter, showed necrosis and hemorrhagic areas. On microscopic examination, medium-size cytotrophoblasts, rounded and lightly stained cytoplasm, clear cell boundaries, small, round and dark central nuclei, syncytiotrophoblasts with cytoplasmic vacuoles, nuclei with coarse chromatin, and unclear cellular boundaries were observed. Immunohistochemical staining was positive for CAM 5.2, AE1/AE3, inhibin and β-hCG, and negative for placental alkaline phosphatase, carcinoembryonic antigen and neuron-specific enolase, ultimately confirming the diagnosis of non-gestational choriocarcinoma.

Postoperatively, the patient was treated with adjuvant chemotherapy, including five cycles of BEP (bleomocin, ethoposide and cisplatin)[3]. The serum β-hCG level decreased to 4589 mIU/mL 1 week after surgery and was within the normal range after three cycles of chemotherapy. The patient was well after more than 5 years of follow-up, without evidence of disease and with regular menses (Figure 2).

Malignant ovarian germ-cell tumors are subdivided into dysgerminomatous (the most common type) and non-dysgerminomatous tumors[4]. The most common types of non-dysgerminomatous tumors are yolk-sac tumors, immature teratomas and mixed germ-cell tumors. Less common variants are embryonal carcinomas, polyembryomas and choriocarcinomas[3]. Choriocarcinoma can be either of gestational or non-gestational origin. Non-gestational choriocarcinoma of the ovary

is a malignant and extremely rare germ-cell neoplasm, occurring most frequently in adolescents and young women. Ovarian choriocarcinoma has a good prognosis with an 80% 5-year survival rate[5].

Our report highlights that, in a young patient with elevated β-hCG and a solid and richly vascularized ovarian lesion at ultrasound examination, a diagnosis of choriocarcinoma should be considered, even in the presence of the ovarian crescent sign. Moreover, fertility-sparing surgery can be proposed to the patient due to the high sensitivity to chemotherapy of these tumors.

F. Mascilini[1]*, F. Moro[2], F. M. Di Grazia[2], M. Leombroni[3], M. G. Distefano[1], F. Fanfani[3], G. Scambia[2] and A. C. Testa[2]
[1]*Department of Women's and Children's Health, Agostino Gemelli Foundation University Hospital, L.go A. Gemelli 8, 00168, Rome, Italy;*
[2]*Department of Women's and Children's Health, Catholic University of the Sacred Heart, Rome, Italy;*
[3]*Department of Medicine and Aging Sciences, University "G. D'Annunzio" of Chieti-Pescara, Italy*
**Correspondence. (e-mail: floriana_mascilini@hotmail.com)*
DOI: 10.1002/uog.18943

References

1. Guerriero S, Testa AC, Timmerman D, Van Holsbeke C, Ajossa S, Fischerova D, Franchi D, Leone FP, Domali E, Alcazar JL, Parodo G, Mascilini F, Virgilio B, Demidov VN, Lipatenkova J, Valentin L. Imaging in gynecological disease (6): clinical and ultrasound characteristics of ovarian dysgerminoma. *Ultrasound Obstet Gynecol* 2011; **37**: 596–602.
2. Alcázar JL, Guerriero S, Pascual MÁ, Ajossa S, Olartecoechea B, Hereter L. Clinical and sonographic features of uncommon primary ovarian malignancies. *J Clin Ultrasound* 2012; **40**: 323–329.
3. Pectasides D, Pectasides E, Kassanos D. Germ cell tumors of the ovary. *Cancer Treatment Rev* 2008; **34**: 427–441.
4. Low JJ, Ilancheran A, Ng JS. Malignant ovarian germ-cell tumours. *Best Pract Res Clin Obstet Gynaecol* 2012; **26**: 347–355.
5. Jiao LZ, Xiang Y, Feng FZ, Wan XR, Zhao J, Cui QC, Yang XY. Clinical analysis of 21 cases of nongestational ovarian choriocarcinoma. *Int J Gynecol Cancer* 2010; **20**: 299–302.

SUPPORTING INFORMATION ON THE INTERNET

The following supporting information may be found in the online version of this article:

Videoclip S1 Grayscale ultrasound video showing solid ovarian mass with inhomogeneous echotexture and absence of stripy echogenicity.

Videoclip S2 Power Doppler examination showing richly vascularized solid ovarian mass.