

Ultrasound manifestations of lobulated ovaries

Case report

Tianjiao Chen^a, Jianchu Li, MD^a, Xiao Yang, MD^a, Huifang Huang, MD^b, Sheng Cai, MD^{a,*}

Abstract

Rationale: Ultrasound features of lobulated ovaries are rarely described in the literature. Here, we report a case of pathologically proven lobulated ovaries.

Patient concerns: A 22-year-old female with irregular menstrual cycles for 9 years came to our hospital because of endless menstruation and anemia for 1 month.

Diagnoses: Ultrasound and computed tomography revealed pelvic masses. But diagnosing or excluding neoplasms based on imaging findings was difficult.

Interventions: The patient underwent an exploratory laparotomy. Some nodules in the right adnexal region were removed, and a left ovarian biopsy was performed.

Outcomes: Pathology results revealed nodular ovarian tissue with cortical fibrosis, but no tumor cells.

Lessons: Our case demonstrates ultrasound manifestations of lobulated ovaries and the importance of being acquainted with these features.

Abbreviations: CA = carbohydrate antigen, CDFI = color Doppler flow imaging, CT = computed tomography.

Keywords: CDFI, irregular menstrual cycles, lobulated ovaries, ovarian malformation, ultrasound manifestations

1. Introduction

Lobulated ovaries are defined as ovaries divided into lobules by 1 or more cracks.^[1] To our knowledge, there were little about lobulated ovaries in the literature. In this article, we report a case of pathologically proven lobulated ovaries and demonstrate the ultrasound manifestations. We believe that radiologists and gynecologists should be aware of this ovarian malformation.

2. Case report

A 22-year-old female had experienced irregular menstrual cycles for 9 years since menarche at age 13. Her menstruation occurred approximately every 30 days and lasted for approximately 10 to 20 days. She came to our hospital because of endless menstruation and anemia for 1 month. Her other past medical

history was unremarkable. During the bimanual examination, an irregular mobile cyst-solid mass about 6 cm in diameter were detected behind and on the left side of the uterus. Laboratory tests showed normal levels of alpha-fetoprotein, carbohydrate antigen (CA) 19-9, carcinoembryonic antigen, and CA125. Her testosterone level was 0.83 ng/mL (0.10–0.75 ng/mL) on the third day of her next menstrual cycle. Some previous ultrasound results demonstrated an enlarged, abnormally shaped right ovary, some indicated bilateral adnexal cystic-solid masses. A transvaginal ultrasound performed at our hospital showed irregular hypoechoic masses with many lobules in the pelvis. The largest lobule was approximately 8.5 cm × 2.8 cm on the right side. Small follicle-like areas were scattered among the masses, with the largest one approximately 0.7 cm in diameter. Ovarian-like structures of 1.9 cm × 1.4 cm and 3.7 cm × 2.0 cm in size were also observed in the right and left adnexal regions, respectively (Fig. 1). Color Doppler flow imaging (CDFI) showed regularly arborized vascularization (Fig. 2). Ultrasound results suspected ovarian malformation, but neoplasms had to be excluded. Bilateral adnexal cystic masses, with the largest part about 5.0 cm × 4.7 cm, were detected on computed tomography (CT) images. CT images showed slight enhancement in the walls of the masses, indicating that malignancy could not be excluded.

Since eliminating malignancy was difficult, the patient was admitted to the hospital and underwent an exploratory laparotomy. During the surgery, clusters of cobble-like, predominantly solid nodules were detected where the ovaries are normally located (Figs. 3 and 4). The nodules ranged in size from 2 to 6 cm with a thick external layer. Some nodules in the right adnexal region were removed, and a left ovarian biopsy was performed. Pathology results revealed nodular ovarian tissue with cortical fibrosis, but no tumor cells. The patient was diagnosed with lobulated ovaries by exploratory laparotomy and pathological findings. She was discharged from the hospital 11

Editor: N/A.

Funding: This study was supported by grants from the National Natural Science Foundation of China (to JL, Grant No. 61571465).

The authors have no conflicts of interest to disclose.

^a Department of Ultrasound, ^b Department of Obstetrics and Gynecology, Peking Union Medical College Hospital, Chinese Academy of Medical Sciences, Shuaifuyuan 1, Shuaifuyuan, Dongcheng District, Beijing, China.

* Correspondence: Sheng Cai, Department of Ultrasound, Peking Union Medical College Hospital, Chinese Academy of Medical Sciences, Shuaifuyuan 1, Dongcheng District, Beijing 100730, China. (e-mail: caisheng007@163.com).

Copyright © 2018 the Author(s). Published by Wolters Kluwer Health, Inc. This is an open access article distributed under the Creative Commons Attribution-NoDerivatives License 4.0, which allows for redistribution, commercial and non-commercial, as long as it is passed along unchanged and in whole, with credit to the author.

Medicine (2018) 97:18(e0550)

Received: 26 January 2018 / Accepted: 4 April 2018

<http://dx.doi.org/10.1097/MD.00000000000010550>

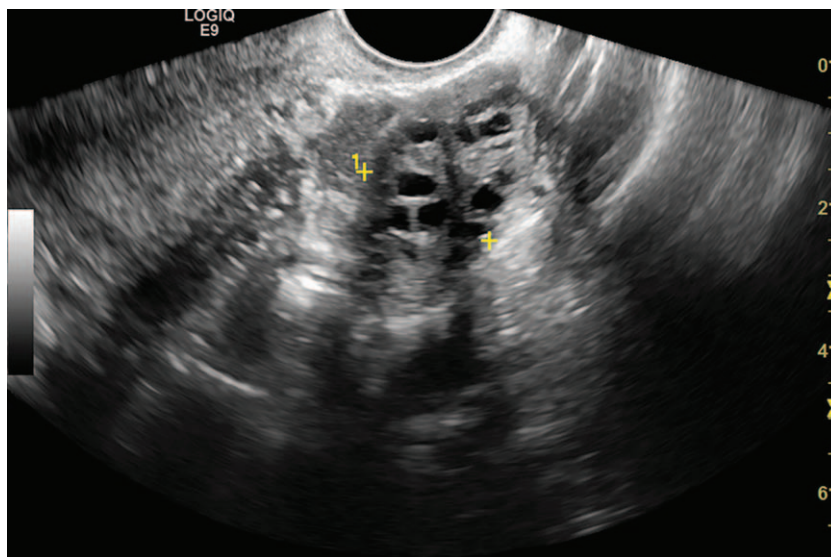


Figure 1. Transvaginal image of an ovarian-like structure (cursors).

days later and recovered well. Patient consent was obtained during the clinical process. This case study has been approved by the Institutional Review Board (IRB) of Peking Union Medical College Hospital.

3. Discussion

Lobulated, supernumerary, and accessory ovaries have been described previously, and the latter 2 types are defined as ectopic ovaries, which refers to any ovarian tissue in addition to normal ovaries.^[1-3] In our case, ovarian tissue was detected in a structure with many lobules in the normal location for ovaries. The prevalence of female genital system anomalies was studied in 3811 infertile women.^[4] Among them, only 2 women were diagnosed with an accessory ovary, 2 had a supernumerary

ovary, and none were identified as having lobulated ovaries.^[4] This study shows that while accessory and supernumerary ovaries are rare, lobulated ovaries are likely even rarer. Like accessory ovaries, lobulated ovaries also develop from abnormal embryogenesis and are related to congenital malformations.^[5]

In our case, masses were more likely to be mistaken for malignancy during CT examination because CT images are presented in layers, whereas ultrasound images are viewed in real time. Imagining three-dimensional images for lobate lumps is not easy for radiologists reading CT images, particularly when the mass is quite large. However, diagnosing or excluding tumors during ultrasound examination is still difficult. First, there are many reports of accessory ovaries and supernumerary ovaries in the literature, but few reports exist regarding lobulated ovaries. Ultrasound features of lobulated ovaries are rarely described in

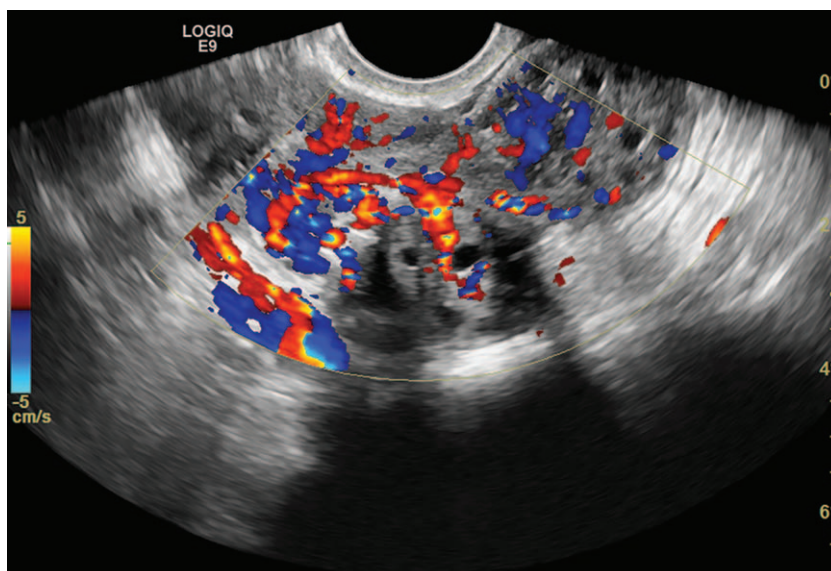


Figure 2. Transvaginal image of an irregular cystic-solid adnexal mass with rich, regularly arborized vascularization.

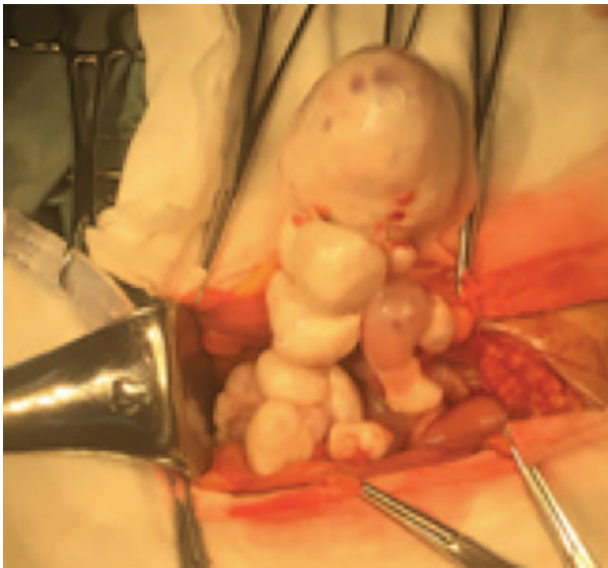


Figure 3. Clusters of cobble-like, predominantly solid nodules in the right adnexal region.



Figure 4. Durian-like, yellowish-white tissue inside the nodule.

the literature and are not easily recalled in the first place. Second, the masses in our patient were large and exhibited cortex fibrosis. Because the normal ovarian structure had almost disappeared, the masses appeared more solid than normal ovarian tissue during ultrasound examination. The origin of the masses was also difficult to differentiate. As the patient had no history of malignant lesions, metastatic neoplasms were unlikely. However,

other neoplasms, such as those of pelvic or mesentery origin, had to be excluded because neoplasms compressing the ovaries were also possible.

In our opinion, some key considerations exist in the differential diagnosis. First, gray-scale sonography should be taken seriously, and performing a thorough scan to view the entire mass is important. As so many lobules were present in our case and not all lobules were in the same section, sonographers may have obtained only a partial view of the entire mass when ovarian enlargement was indicated in previous ultrasounds. Purposely searching for follicles is also important. Small anechoic areas scattered among the mass could indicate follicles, and follicles may further indicate ovarian tissue. Ovarian-like tissue could help identify the origin. Next, close attention should be paid to vascularization. In our case, regularly arborized vascularization indicated that multiple lobules were fused together and shared the same origin. Sonographers may have overlooked the vascularization characteristic when multiple cystic-solid masses were indicated in previous ultrasounds. If a large, lobulated mass is mistaken for many small ones, the entire mass may be easily mistaken for metastatic neoplasms. Finally, ovarian malformation should be considered. Both radiologists and gynecologists should deepen their understanding of lobulated ovaries. We should be aware that malignancy may occur in one of the lobules, and careful observation is our first priority.

In conclusion, radiologists and gynecologists should raise awareness of lobulated ovaries to avoid mistaking them for malignancy. Taking both gray-scale images and vascularization seriously is important, as these considerations could provide valuable information for the differential diagnosis of pelvic masses.

Author contributions

Conceptualization: Sheng Cai.

Funding acquisition: Jianchu Li.

Resources: Xiao Yang, Huifang Huang.

Writing – original draft: Tianjiao Chen.

Writing – review & editing: Tianjiao Chen, Jianchu Li, Xiao Yang, Huifang Huang, Sheng Cai.

References

- [1] Benbara A, Tigaizin A, Carbillon L. Accessory ovary in the utero-ovarian ligament: an accidental finding. *Arch Gynecol Obstet* 2011;283:123–5.
- [2] Gupta R, Verma S, Bansal K, et al. Mature teratoma in a supernumerary ovary in a child- report of the first case. *J Pediatr Adolesc Gynecol* 2016;29:e5–7.
- [3] Kiuchi K, Hasegawa K, Nagai T, et al. Uterine cervical adenocarcinoma metastasizing concurrently to eutopic and ectopic ovaries: a case report. *J Obstet Gynaecol Res* 2016;42:899–904.
- [4] Siam S, Soliman BS. Combined laparoscopy and hysteroscopy for the detection of female genital system anomalies results of 3,811 infertile women. *J Reprod Med* 2014;59:542–6.
- [5] Temiz M, Aslan A, Gungoren A, et al. A giant serous cystadenoma developing in an accessory ovary. *Arch Gynecol Obstet* 2008;278:153–5.