



Color Doppler & CT Findings of An Immature Ovarian Teratoma: A Case Report

Mir Mahin Ashraf¹, Bibekananda Halder², Partha Pratim Saha³

Article information

Received: 21-10-2021

Accepted: 05-12-2021

Cite this article:

Ashraf MM, Halder B, Saha PP. Color Doppler & CT Findings of An Immature Ovarian Teratoma: A Case Report. Sir Salimullah Med Coll J 2022; 30: 89-92

Key words:

Immature teratoma, Doppler, Ultrasound, CT scan

Abstract

Immature ovarian teratomas are uncommon germ cell tumors of unknown etiology. Preoperative diagnosis can be difficult impacting the management of this case. Color Doppler ultrasound can predict malignant nature as well as exclude complications earlier, which is important for management & prognosis. Here we present a young female patient came for an emergency ultrasound with progressive abdominal distension and pain. Ultrasound showed huge ascites with a large, irregular, heterogeneous, predominantly solid, left ovarian mass with internal calcifications, focal echogenic & anechoic areas and prominent intratumoral arteries with low resistant flow (RI: 0.34). The lesion was further evaluated on a CT later showing heterogeneous contrast enhancement, fat-fluid densities & calcifications.

Introduction

Immature ovarian teratomas are rare malignant germ cell tumors affecting the younger age group accounting for less than 1% of ovarian teratomas with an unknown etiology.¹ The tumor is composed of tissue derived from the three germ layers. In comparison to the much more frequent mature teratoma, it contains immature or embryonal structures.² Preoperative diagnosis can be challenging for the clinicians.

These are predominantly solid masses with chance of metastasis, rupture or torsion. Use of color Doppler sonography may improve the early detection of malignant ovarian tumors.³ A low resistant arterial flow of less than 0.5 resistive index (RI) should raise the suspicion of an ovarian tumor of malignant potential.⁴ CT scan is also used

to evaluate immature teratomas showing marginal irregularity, solid nature with irregular enhancement, scattered indistinct calcifications, septal irregularity, local invasion or distant metastasis.⁵

Here we reported a case where color Doppler ultrasound has played an important role to predict the malignant nature of teratoma.

Case report

A 13 years old unmarried female came to our radiology and imaging department at midnight for an emergency ultrasound. She had history of progressive abdominal distension and pain. On clinical examination a palpable abdominal mass was found. Ultrasound showed huge ascites with a large, well-defined, irregular, heterogeneous,

1. MD Phase-B Resident, Department of Radiology & Imaging, Sir Salimullah Medical College & Mitford Hospital

2. Professor & Head, Department of Radiology & Imaging, Sir Salimullah Medical College & Mitford Hospital

3. Assistant Professor, Department of Radiology & Imaging, Sir Salimullah Medical College & Mitford Hospital

Address of Correspondence: Dr. Mir Mahin Ashraf, MD Phase-B Resident, Department of Radiology & Imaging, Sir Salimullah Medical College & Mitford Hospital

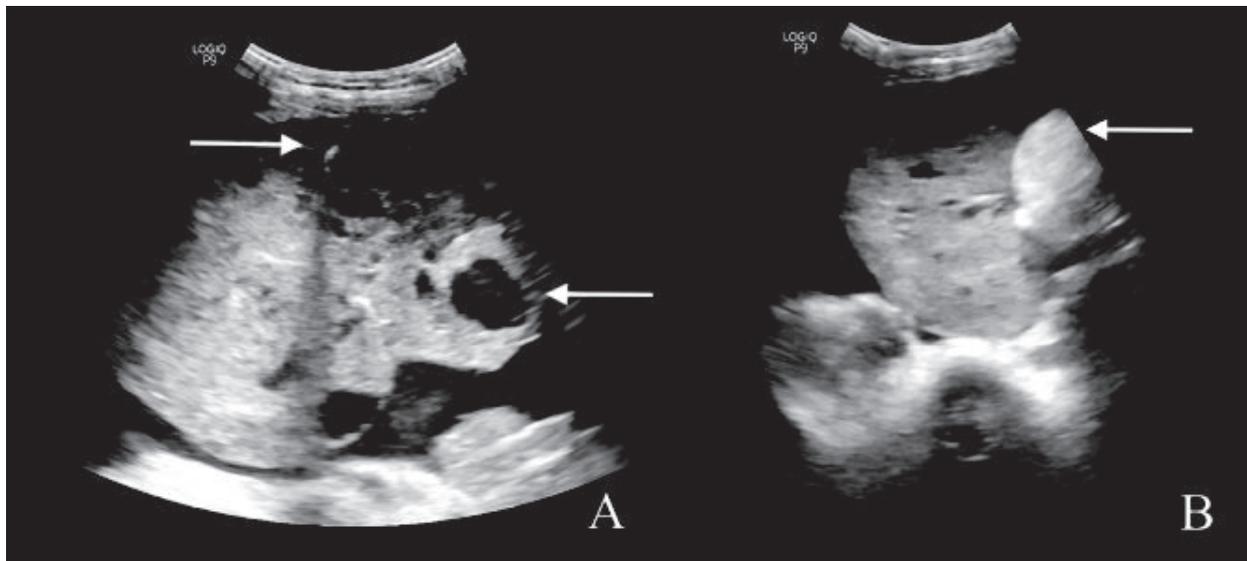


Fig.-1: B-mode ultrasound. A. Heterogeneous, predominantly solid, left ovarian mass with internal hypo to anechoic cystic spaces and hyperechoic calcifications. B. Internal hyperechoic sound attenuating fat component is seen. Surrounding ascites is seen.

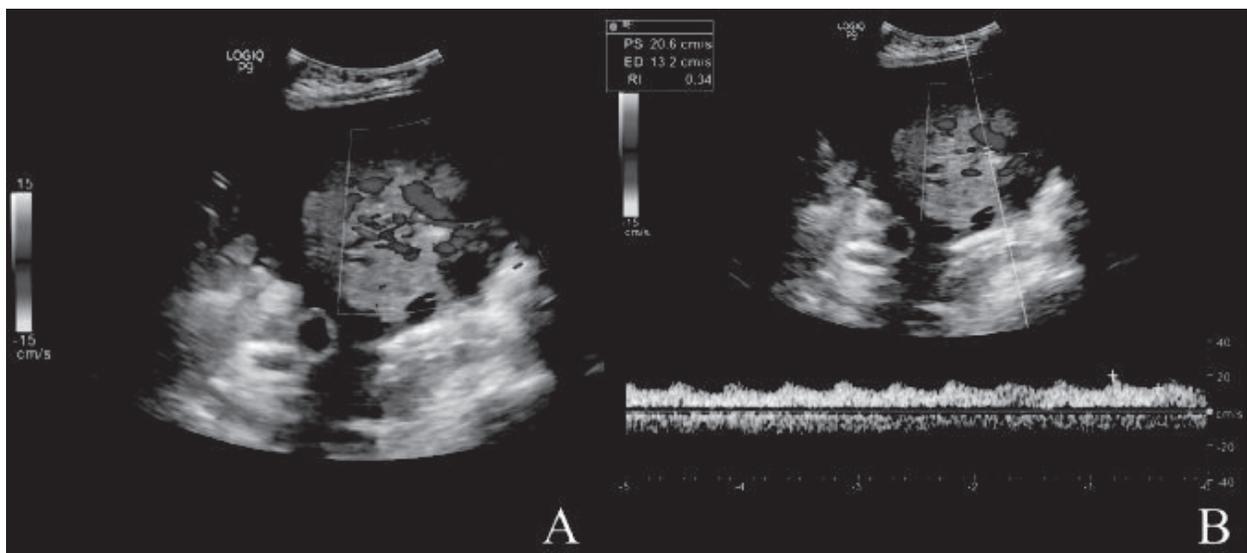


Fig.-2: Color Doppler ultrasound. A. Prominent intratumoral vessels. B. Low resistant flow with an RI of 0.34.

predominantly solid, left ovarian mass with internal hypo to anechoic cystic spaces, hyperechoic sound attenuating fat component and hyperechoic calcific foci casting acoustic shadows. Color Doppler showed prominent intratumoral supplying arteries originated from ovarian artery having low resistant flow. The resistive index (RI) was 0.34 and the pulsatility index (PI) was 0.42. These features

suggested the malignant nature of teratoma. The lesion was further evaluated on CT later showing large soft-tissue density left ovarian mass with internal fat-fluid densities, scattered calcifications & ascites. After intravenous contrast administration, a heterogeneous enhancement is noted within the solid component suggesting the lesion as immature ovarian teratoma.

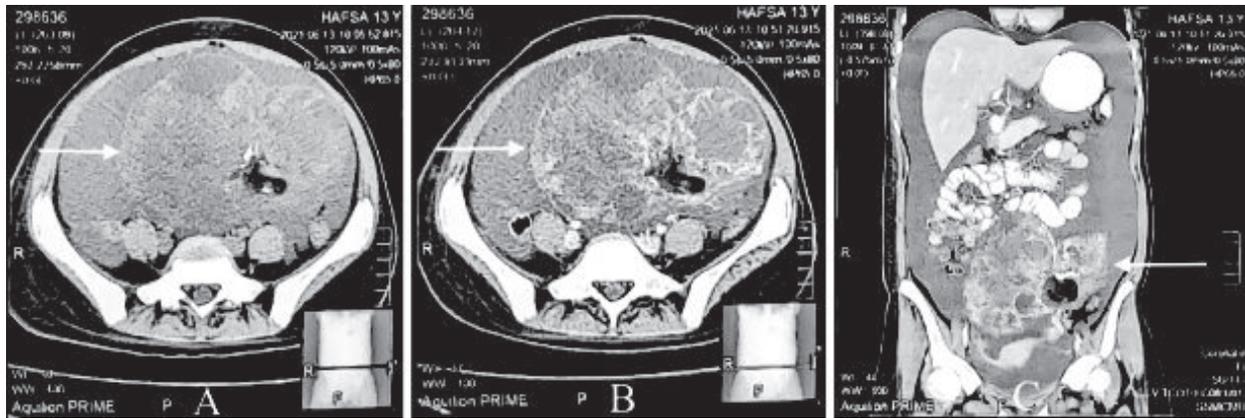


Fig.-3: CT scan. A. Axial non-contrast image showing ascites and heterogeneous mass with solid & cystic components, fat-fluid densities and calcifications. B,C. Axial & reconstructed post-contrast images showing heterogeneous enhancement within the solid component.

Discussion

Teratomas are benign or malignant neoplasms derived from the primordial germ cells. They can arise in the gonads or in extragonadal locations. Teratomas are classified histologically into mature (benign), immature (malignant) and monodermal or highly specialized (struma ovarii and carcinoid) types.⁵ Immature teratomas differ from mature cystic teratomas in that they demonstrate clinically malignant behavior, commonly affect the younger age group, usually during the first two decades of life and are histologically distinguished by the presence of immature or embryonic tissues. The etiology is usually unknown. Patients usually do not present with pain or abdominal mass until the rapidly growing lesion reaches a considerable size or may undergo torsion or rupture as complications. Metastasis to retroperitoneal, para-aortic and more distant lymph nodes and later to the lungs, liver and other organs may impact on management as well as on prognosis.⁶ In view of this, teratomas occurring in childhood, adolescence and early adult life should always be examined carefully and thoroughly sampled.

On ultrasound, the tumors are heterogeneous, predominantly solid lesions with scattered calcifications and foci of fat. Color Doppler should always be used in combination with grayscale ultrasound as the first diagnostic modality of choice for all the patients with ovarian masses.⁷ Ovarian mass with central prominent arterial flow of low impedance of less than 0.5 RI should raise the

suspicion of an ovarian tumor of malignant potential.⁴ Study shows a good specificity (84.1%) and sensitivity (97.5 %) with PI and RI values of <1.0 and <0.6, respectively in differentiating between malignant and benign ovarian tumors.⁸ In our case, 0.42 of PI & 0.34 of RI in intratumoral arteries helped us predict the malignant nature of the lesion.

On CT scan, immature ovarian teratomas show marginal irregularity, solid nature with heterogeneous contrast enhancement, fat-fluid densities & scattered calcifications. CT can also help evaluate the local invasion and distant metastasis which was not present in our case.⁹

Conclusion

This case represents the color Doppler ultrasound and CT evaluation of immature ovarian teratoma. A keen observation of imaging modalities is needed to achieve accurate diagnosis, exclude complications and help further management.

References

1. Bonazzi C, Peccatori F, Colombo N, Lucchini V, Cantù MG, Mangioni C. Pure ovarian immature teratoma, a unique and curable disease: 10 years' experience of 32 prospectively treated patients. *Obstet Gynecol.* 1994;84:598–604.
2. Varma AV, Malpani G, Agrawal P, Malukani K, Dosi S. Clinicopathological spectrum of teratomas: an 8-year retrospective study from a tertiary care institute. *Indian J Cancer.* 2017;54:576–9.
3. Kurjak A, Zalud I. Tumor neovascularization. In: Kurjak A, ed. *Transvaginal color Doppler.* London: Parthenon P, 1990; 94-105.

4. Tepper, Ronnie, et al. "Sonographic and Doppler flow characteristics of ovarian tumors of low malignant potential." *Journal of clinical ultrasound* 25.2 (1997): 57-61.
5. Kim, Jong Chul, and Young Wol Kim. "CT Findings of Ovarian Teratomas: Mature versus Immature." *Journal of the Korean Radiological Society* 35.6 (1996): 949-955.
6. Mremi, Alex, et al. "Immature teratoma of the ovary in a 1 year and 9-month-old child: a case report and review of the literature." *Journal of Surgical Case Reports* 2021.1 (2021): rjaa609.
7. Sehgal N. Efficacy of Color Doppler Ultrasonography in Differentiation of Ovarian Masses. *J Midlife Health*. 2019;10(1):22-28. doi:10.4103/jmh.JMH_23_18.
8. Shah D, Shah S, Parikh J, Bhatt CJ, Vaishnav K, Bala DV. Doppler ultrasound: a good and reliable predictor of ovarian malignancy. *J Obstet Gynaecol India*. 2013 Jun;63(3):186-9. doi: 10.1007/s13224-012-0307-9. Epub 2012 Nov 10. PMID: 24431635; PMCID: PMC3696138.
9. Brammer HM III, Buck JL, Hayes WS, Sheth S, Tavassoli FA. From the archives of the AFIP. Malignant germ cell tumors of the ovary: radiologic-pathologic correlation. *RadioGraphics* 1990; 10:715-724.