

Immature teratoma remains a difficult diagnosis

A cross sectional study

Dr Sian Mitchell, Dr Frances Bailey, Alison Smith, Mr Ahmad Sayasneh

Objective

The ultrasound features of ovarian mature teratomas are well defined and can be frequently identified on ultrasound¹. However, literature regarding the ultrasound features of immature teratomas is lacking and features can often be confused with those of mature teratomas¹. The primary objective is to evaluate the subjective assessment of ultrasound examiners' interpretation of anonymised static B mode ultrasound images of immature and mature teratomas.

Design

This was a questionnaire of anonymised B mode ultrasound images distributed electronically to level 1 to 3 ultrasound examiners as per the European societies for ultrasound in medicine and biology (EFSUMB).

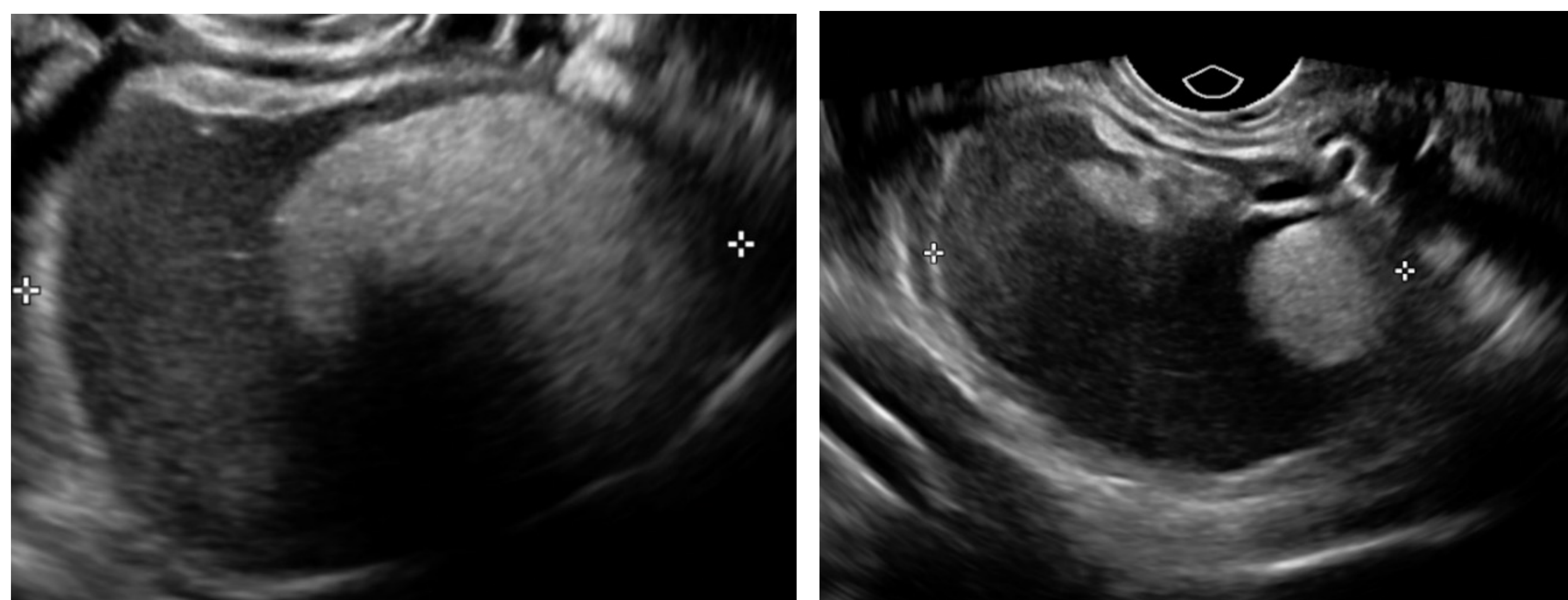


Image 1 –Static B-mode ultrasound images of mature teratomas

Method

Anonymised ultrasound images of 9 immature teratomas, 9 mature teratomas, 1 endometrioma, 1 endometrioid ovarian carcinoma, 1 serous borderline tumour, 1 granulosa cell tumour and 1 simple ovarian cyst were identified and included in an electronic questionnaire. The images were collected retrospectively, and the reference test was surgical removal of the ovarian mass and the final histology. All malignant histological results were classified as per the WHO classification of ovarian cancer. The questionnaire was electronically distributed to ultrasound examiners using a survey monkey distributed via BMUS and the postgraduate deanery. Statistics were performed using Stata MP/17.0 (2023,USA) and the sensitivity and specificity test of the subjective assessment for each histological group was calculated.

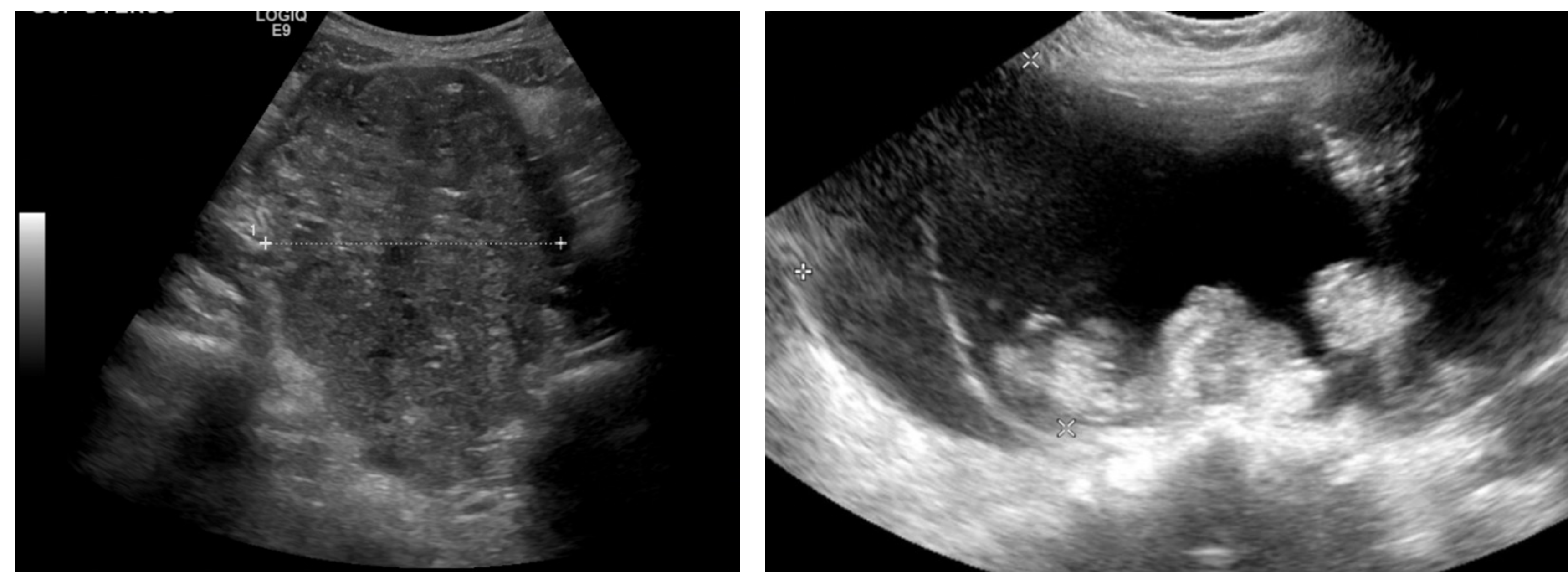


Image 2 –Static B-mode ultrasound images of Immature teratomas

Results

From the study, there were a total of 43 responses (30 responses from level 1 ultrasound examiners, 9 responses from level 2 examiners and 4 responses from level 3 examiners). The sensitivity and specificity of subjective assessment ranged from 16.3% - 97.7% and 81.6%-96.1%, respectively, for all histological groups. The highest sensitivity of 97% (95% CI: 87.7-99.9%) was achieved for simple cyst diagnosis. The endometrioid ovarian carcinoma was misdiagnosed most commonly (16.3%, 95% CI: 6.81-30.7%). The sensitivity and specificity for mature teratomas were 41.3% (95% CI: 36.3-46.4%) and 82.2% (95% CI: 78.9-85.1%), respectively. The sensitivity and specificity for immature teratomas was 41.2 % (95% CI: 36.2-46.3%) and 81.6 % (95% CI: 78.3-84.7%). There was no statistical difference in the diagnostic performance of the subjective impression of examiners between mature and immature teratomas ($p=0.975$).

Conclusion

Immature teratoma impose a diagnostic challenge still and can get mixed up with mature teratoma and other benign pathology. More training and awareness is required to be able to improve the diagnostic performance of subjective impression of ultrasound examiners.

References

Saba L, Guerriero S, Sulcis R, Virgilio B, Melis GB, Mallarini G. Mature and immature ovarian teratomas: CT, US and MR imaging characteristics. *Eur J Radiol.* 2009;72(3):454-463. doi:10.1016/j.ejrad.2008.07.044