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Do all Solid Components Identified on Ultrasound in Ovarian Tumours Demonstrate Diffusion Restriction on MRI? An Imaging–Histopathological Correlation

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Objectives

- To assess whether **solid components of ovarian tumours show diffusion restriction with low ADC values** on MRI.
- To evaluate the **correlation between ultrasound solid areas and MRI diffusion restriction**.
- To identify **non-tumour causes of diffusion restriction** on MRI.
- To determine whether diffusion restriction aids **tumour characterization and malignancy prediction**.

Methods

- This was a **retrospective multicenter study** of neoplastic adnexal masses with known histopathology and solid areas on ultrasound. Two examiners reviewed **greyscale and Doppler images/videoclips**.
- A subspecialty radiologist in **MR gynecological oncology** reviewed MRI images and reached consensus. The study included **50 ovarian tumours with 13 histopathological diagnoses**.

Conclusion

A comprehensive imaging with clinical data, careful physical examination, localizing the point of tenderness, lab parameters, serum beta hcg titres, forniceal tenderness during tvs, free peritoneal fluid, a systematic assessment for urological, gynecological, and surgical causes of acute pelvic pain are important.

Results

- Out of 50 cases, there were **20 serous**, **7 mucinous**, **3 endometrioid**, **2 clear cell**, **2 Brenner tumours**, **5 mature cystic teratomas**, **2 dysgerminomas**, **1 yolk sac tumour**, **1 struma ovarii**, **2 granulosa cell tumours**, **3 fibromas**, **1 fibrothecoma** and **1 Krukenberg tumour**.
- **80% of solid areas showed diffusion restriction with corresponding low ADC values**, particularly in malignant tumours. Diffusion restriction was useful in identifying solid areas, especially in **clear cell and endometrioid tumours associated with endometriosis**.
- **Fibromas appeared solid on ultrasound but showed no diffusion restriction**. Thick hemorrhagic contents in granulosa cell tumours and sebum in dermoids also demonstrated restricted diffusion. **Ovarian torsion showed diffusion restriction due to ischaemia**.

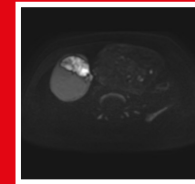


Figure 1 .Restricted diffusion of solid areas in endometriotic cyst, clear cell carcinoma

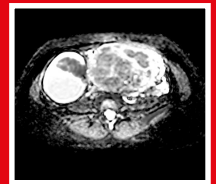


Figure 2. Dysgerminoma ,a solid lobulated vascular tumor on ultrasound with diffusion restriction

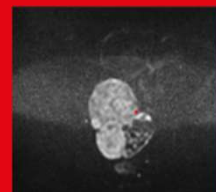


Figure 3. Granulosa cell tumour with large solid component on ultrasound showing restricted diffusion

