Solid Adnexal Masses: All you need to know

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Introduction

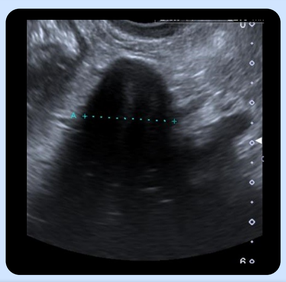
Pelvic ultrasound is the most common technique used to assess adnexal masses and it is important for all practitioners to understand the relevant sonographic features. Although the majority of ovarian tumours are predominantly cystic, predominantly solid masses are important to recognise as although they are often benign, they can include highly malignant or metastatic cell types. Many extra-ovarian masses can also mimic ovarian pathology in the adnexa. Understanding the key identifying features of solid adnexal masses and potential pitfalls is therefore extremely valuable in everyday practice.

Ovarian Masses

Key: Ultrasound Features | Hormone/Tumour Marker | % of all Ovarian Tumours

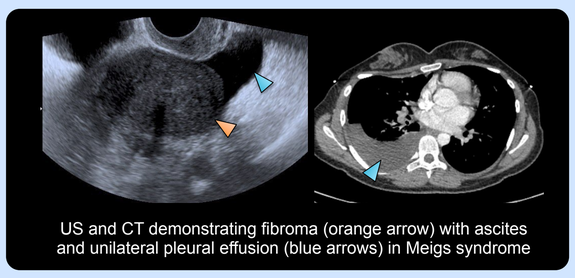
Fibroma — 3-4%

- Unilateral in 90% of cases
- Most common benign solid ovarian tumour
- Peri/post menopausal



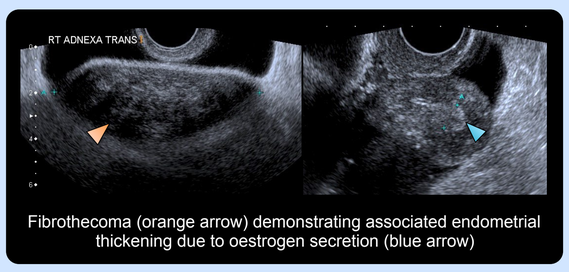
Homogenously hypoechoic
Posterior acoustic shadowing
Due to dense fibrous material

Meig's syndrome
- Pleural effusion +/- ascites
- Associated 1-3% of fibromas



US and CT demonstrating fibroma (orange arrow) with ascites and unilateral pleural effusion (blue arrows) in Meigs syndrome

Fibrothecoma
- Has thecoma element which produces **Oestrogen**



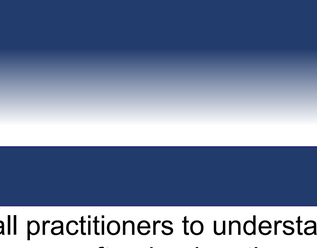
Fibrothecoma (orange arrow) demonstrating associated endometrial thickening due to oestrogen secretion (blue arrow)

Granulosa Cell Tumour
(ADULT)

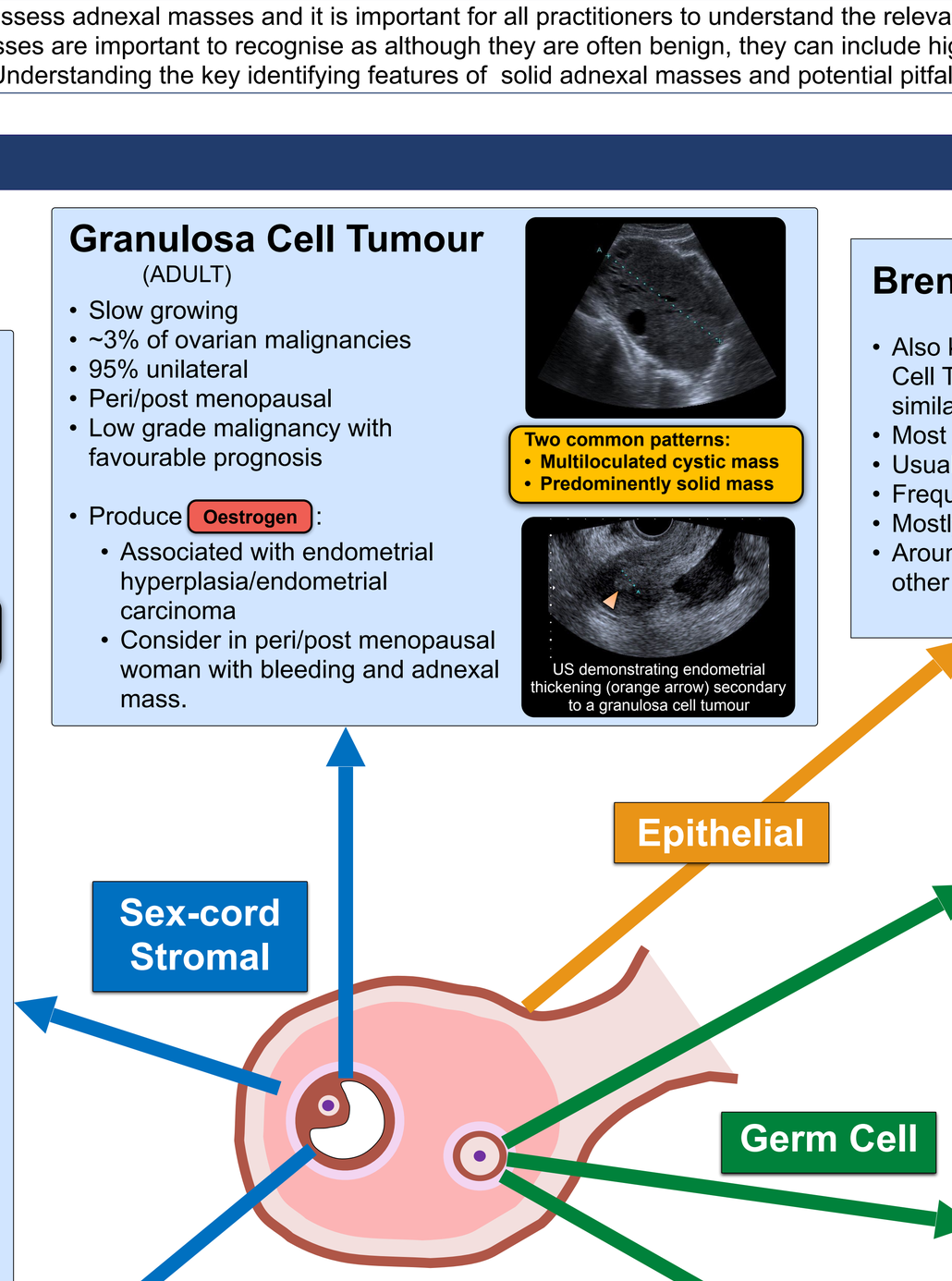
- Slow growing
- ~3% of ovarian malignancies
- 95% unilateral
- Peri/post menopausal
- Low grade malignancy with favourable prognosis

- Produce **Oestrogen**:
  - Associated with endometrial hyperplasia/endometrial carcinoma
  - Consider in peri/post menopausal woman with bleeding and adnexal mass.

Two common patterns:
- **Multiloculated cystic mass**
- **Predominently solid mass**



US demonstrating endometrial thickening (orange arrow) secondary to a granulosa cell tumour



Brenner Tumour — ~3%

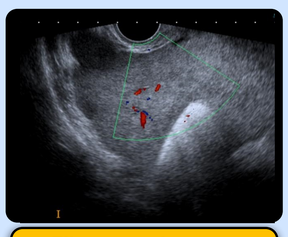
- Also known as a 'Transitional Cell Tumour' (histologically similar to uroepithelium)
- Most common 5th-7th decade
- Usually unilateral
- Frequently an incidental finding
- Mostly benign
- Around 20% associated with other epithelial neoplasms

Small Hypoechoic mass
Calcification in 50%
DDx: Fibroma/Fibroid

Dysgerminoma — 1-2%

- Most common malignant germ cell tumour
- Peak incidence <30yrs
- Highly radiosensitive
- 5yr survival 80%
- Predominantly unilateral

5% produce β-HCG

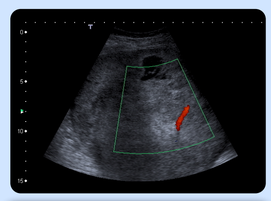


Fibrovascular septa

Immature Teratoma

- <1% of all Teratomas
- <20yrs
- Composed of tissue from all three layers but have immature elements
- Rapidly growing malignant tumours
- Unilateral
- May show features of mature teratoma

50% produce α-fetoprotein[5]



Solid or prominent solid component within a cystic element

Sertoli-Leydig Cell Tumour

- Most common virilising tumour
- Low grade malignancy
- <30yrs
- May go unnoticed due to small size or discovered when looking for polycystic ovaries due to virilising effects

<0.5%

Androgens & Oestrogens

Small and unilateral
Iso/hypoechoic

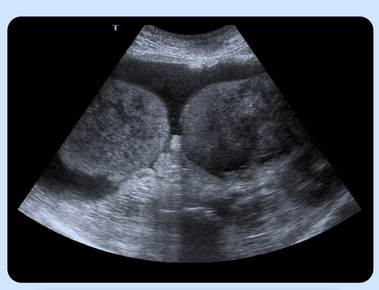
Metastases

- 5-15% of malignant ovarian masses
- Usually from GI, breast or lung primary

Krukenberg Tumours
- 30-50% of ovarian metastases
- Predominantly GI primary

Varied appearances but some tendencies[4]:
- Stomach - more solid
- Colorectal - more cystic

- Poor prognosis (10% 1yr survival)



80% Bilateral[3]
Sharply Demarcated borders
Mixed echogenicity
Vascular solid component

Rare Germ Cell Tumours:

The following:
- Occur in younger patients
- Are highly malignant with poor prognosis
- Have varied, non specific appearances

Yolk Sac Tumours — α-fetoprotein

Choriocarcinoma — β-HCG
- N.B. Presence of adnexal mass with increased β-hCG level can lead to mis-diagnosis of ectopic pregnancy

Is the mass Extra-Ovarian?

Recognising an ipsilateral mass as separate from the ovary is not always easy, especially when there are no follicles or little ovarian tissue as in the post-menopausal patient. These tips may help:

1. Gentle pressure with the transducer/hand on the abdomen may be helpful to separate ovarian issue from adjacent mass
2. Interrogation with a transabdominal transducer may reveal a separate ovary superiorly or laterally within the pelvis.
3. Colour Doppler may reveal a separate vascular supply to the lesion.

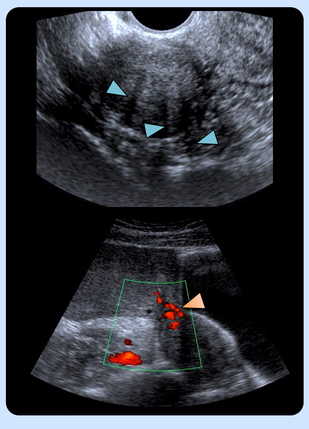
Extra-Ovarian Masses

Common

Pedunculated Fibroid

- Subserosal fibroids may be pedunculated and predominantly extra-uterine, simulating an adnexal mass.
- Differential includes fibroma.
- Fibroids may undergo atrophy, internal haemorrhage, fibrosis, and calcification.

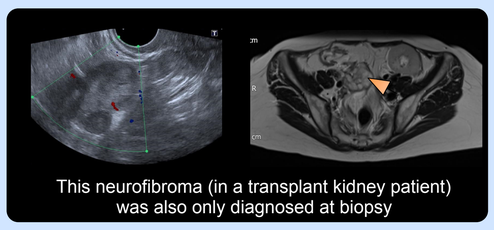
- **Solid mass with posterior acoustic shadowing (divergent linear shadows = "picket-fence' shadowing) - blue arrows**
- **May have vascular pedicle (orange arrow) on colour Doppler to help distinguish from fibroma**



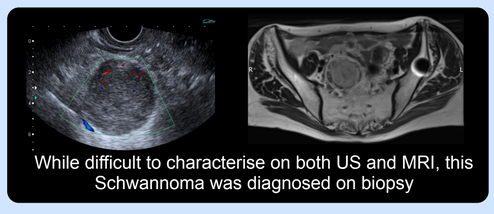
Uncommon Considerations

Schwannomas & Neurofibromas
(Schwann cells only) (Schwann + additional cell types)

- Benign nerve sheath tumours with very low malignant potential
- Extremely rare in the pelvis and the retroperitoneum[2]
- Associated with Neurofibromatosis:
  - Type 1: Neurofibromas
  - Type 2: Schwannomas
- Varied US appearance: diagnosis is often made on excision



This neurofibroma (in a transplant kidney patient) was also only diagnosed at biopsy



While difficult to characterise on both US and MRI, this Schwannoma was diagnosed on biopsy

Also Consider:

- Lymphadenopathy
- Sarcoma
- Metastatic Melanoma

Poster Number 43

Thank you to Dr P Williams for providing images for the Schwannoma case

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4) Testa A, Ferrandina G, Timmerman D, et al. Imaging in gynaecological disease (1): ultrasound features of metastases in the ovaries differ depending on the origin of the primary tumor. Ultrasound Obstet Gynaecol 2007;29(5):505-511
5) Saba L, Guerriero S, Sulcis R et al. Mature and immature ovarian teratomas: CT, US and MR imaging characteristics. Eur J Radiol. 2009;72(3):454-63