Ovarian pathology: IOTA

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Content
ADNEXAL MASSES
SIMPLE
COMPLEX

DESCRIBE WHAT YOU SEE

• Clinically useful
• Benign
• Malignant
• Communication between clinicians/research.

IOTA terms for description of an adnexal mass

Position: bilateral? Side?
Size of lesion
Type of tumour
Number of locules / incomplete septum
Echogenicity
Acoustic shadows
Size of solid component
Papillary projections
Colour score
Ascites
Presence of metastases

IOTA terms for description of an adnexal mass

"Lesion"
• Part of an ovary or adnexal mass inconsistent with normal physiology

Struma ovarii
Haemorrhagic cyst

Consensus statement on how to describe adnexal masses

Terms, definitions and measurements to describe the sonoanatomical features of adnexal tumours: a consensus opinion from the International Ovarian Tumor Analysis (IOTA) group

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Struma ovarii
Haemorrhagic cyst

"5 types of tumour"

Unilocular 63.5%
Unilocular solid 2%
Multilocular solid 16%
Multilocular 73%
Solid (solid tissue comprise ≥ 80% of tumour) 40%
IOTA terms for description of an adnexal mass

'5 types of cyst contents'
- Anechoic
- Low level
- Ground glass
- Haemorrhagic
- Mixed

Solid component
- A structure that has echogenicity suggestive of tissue (ovarian stroma)
- NOT 'white ball' in a dermoid cyst
- NOT blood clot, or mucous
- Concave
- Probe pressure
- Colour Doppler

Papillary projection
- Protrusion of solid tissue into a cyst cavity ≥ 3mm (height)
- Protrusions <3mm (height) = irregularities
- Papillary projections = solid component

Septum
- Thin strand of tissue that runs from one internal cyst surface to another
- Incomplete septum
  - does not reach the opposite wall of the cystic structure in some scanning planes (seen in diseased tubes)

Shadowing

Ascites
- Fluid outside pouch of Douglas
IOTA terms for description of an adnexal mass

'IOTA colour score'
- Adjust settings: maximize detection of flow without artifacts (3-6 cm/s; PRF 0.3-0.6 kHz)

Score 1 (none)
Score 2 (minimal)
Score 3 (moderate)
Score 4 (strong)

How do we use IOTA: practical applications

IOTA: Easy descriptors

- Unilocular cyst, ground glass echogenicity, +/- wall nodularity, Premenopausal woman
  ENDOMETRIOMA

- Unilocular cyst, mixed echogenicity (white ball, dot-dash), shadowing, Premenopausal
  DERMOID CYST

- Unilocular cyst, anechoic cyst fluid, regular walls, < 10 cm
  SIMPLE CYST OR CYSTADENOMA

All other unilocular cysts with regular walls
  BENIGN

IOTA: Pattern recognition

ENDOMETRIOMA
- Unilocular cyst
- Ground glass echogenicity
- +/- wall nodularity
- Premenopausal woman

Wall nodularity (blood clot fibrin)
(Not papillary projection)

DERMOID CYST
- Unilocular cyst
- Mixed echogenicity (white ball, dot-dash)
- Shadowing
- Premenopausal

Mass
At least moderate blood flow
Postmenopausal
Ascites
MALIGNANT

Mass
> 50 years
CA125 > 100 IU/mL
MALIGNANT

SIMPLE CYST OR CYSTADENOMA
- Unilocular cyst
- Anechoic cyst fluid
- Regular walls
- < 10 cm

Easy descriptors
Pattern recognition
Simple rules
ADNEX
LR 1/LR 2
IOTA: Pattern recognition

HAEMORRHAGIC CYST
- Reticular pattern
- Retracting clot

MALIGNANT
- Mass with at least moderate blood flow
- Postmenopausal
- Ascites
- > 50 years
- CA125 > 100 IU/mL

PERITONEAL PSEUDOCYST
- Conforms to shape of peritoneal cavity
- Ovary suspended in edge of cyst

HYDRO (PYO/HEMATO) SALPINX
- Serpiginous
- Incomplete septae
- Cog wheeling
- Beads on a string

HYDRO (PYO/HEMATO) SALPINX
- Conforms to shape of peritoneal cavity
- Ovary suspended in edge of cyst

Solid Pelvic Tumours
- Myoma (uterine)
- Fibroma
- Thecoma
- Brenner tumour
- Leydig cell tumour
- Malignancies

Solid Pelvic Tumours
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Ovarian malignancy
- Neuroendocrine tumour of ovary
- Granulosa cell tumour
- Dysgerminoma
- Irregular contour
- Irregular echogenicity
- Increased vascularity
- Broad ligament fibroid
- Pediculated fibroid
- Round, oval, lobulated
- Tr polarity change
- Mild, moderate, marked
- May mimic pedunculated fibroid
IOTA: Simple Rules

The simple rules

Only M-features = malignant
Only B-features = benign
Both M and B, or no feature = unclassifiable (not applicable)

Timmerman et al UOG 2008

B-rules

Unilocular cysts.
Irregular solid tumour.
Presence of solid component where the largest solid component <7 mm.
Acoustic shadowing.
At least four papillary structures.
Smooth multi-locular tumour with a largest diameter <10 cm.
No blood flow.

M-rules

Irregular solid tumour.
Ascites.
At least four papillary structures.
Irregular multilocular solid tumour with largest diameter ≥ 10 cm.
Very strong blood flow.

IOTA: ADNEX model

https://www.iotagroup.org/sites/default/files/IOTA%20-%20ADNEX%20model.html

1. Age of the patient at examination (years)
2. Ovarian cyst(s) (contain the gyn-ovol?)
3. Maximal diameter of the lesion (mm)
4. Maximal diameter of the largest solid part (mm)
5. More than 10 locules?
6. Number of septations (papillary projections)
7. Acoustic shadowing present?
8. Acalyx (solid outside peel) (a present)
9. Serum CA-125 (U/ml)

The ADNEX multiclass model estimates the likelihood of:
- Benign tumor
- Borderline tumor
- Stage I invasive tumor
- Stage II-IV invasive tumor
- Metastasis in the ovary from another primary

CONCLUSION

1. Describe the mass instead of using the term ‘complex’
2. Be familiar with easy descriptors and pattern recognition
3. If uncertain, use Simple Rules +/- ADNEX

THANK YOU