The International Ovarian Tumour Analysis (IOTA) criteria

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Ultrasound reports

- Are they useful?
- Are we potentially ↑ patient anxiety where urgent gynaecology referral is advised?

Set protocol

[Report Summary]

lower abdo pain and bloating ?ovarian pathology
(Information via Order Comms)

[US Pelvis transabdominal & transvaginal]

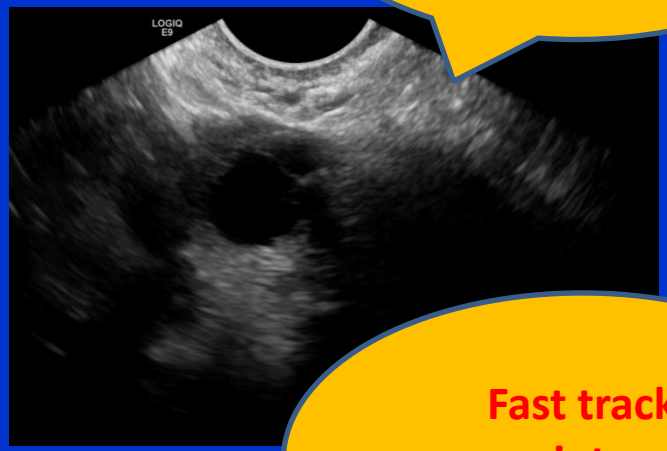
LMP 5 years ago +. Post menopausal.

Anteverted uterus, normal in appearance.
Normal thin endometrial echo measuring 0.7mm
Arising from the left ovary is 16mm cyst with a thin septation.
Normal right ovary.
No free fluid.

Comment
Urgent gynae referral advised in view of left ovarian cyst findings.

..... End of Report .....

Patient anxiety

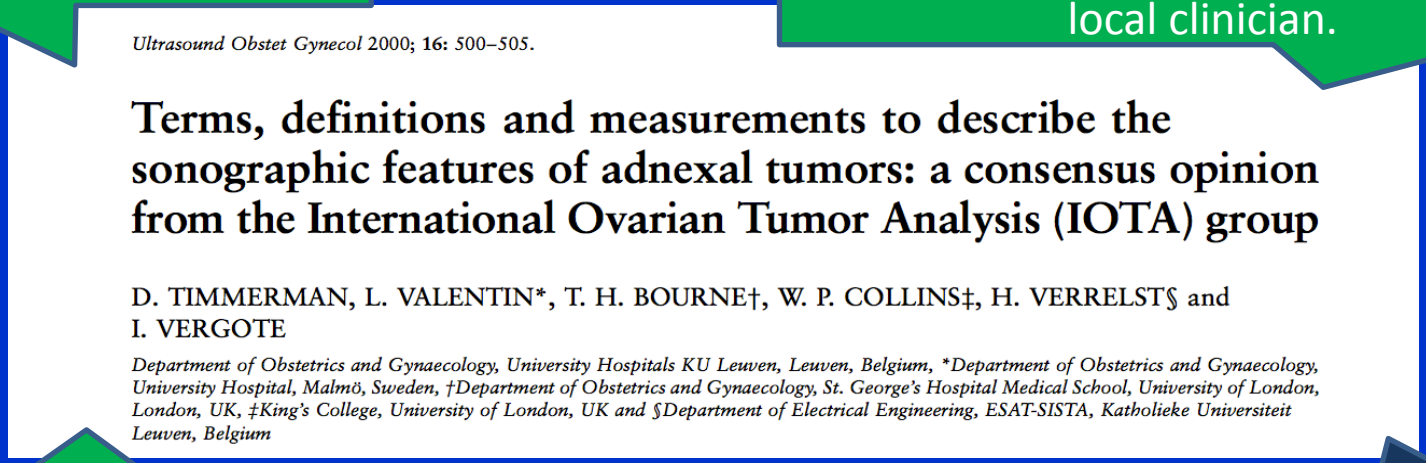


Fast track appointment capacity

The IOTA Group

The simple rules were developed by clinicians and statisticians from the IOTA group

Rules based on clinical and ultrasound data from 1066 women recruited at 9 centres in 5 countries (Italy, Belgium, Sweden, France and UK). All patients included required surgery as judged by a local clinician.



Ultrasound Obstet Gynecol 2000; **16:** 500–505.

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

D. TIMMERMAN, L. VALENTIN*, T. H. BOURNE†, W. P. COLLINS‡, H. VERRELST§ and I. VERGOTE

*Department of Obstetrics and Gynaecology, University Hospitals KU Leuven, Leuven, Belgium, *Department of Obstetrics and Gynaecology, University Hospital, Malmö, Sweden, †Department of Obstetrics and Gynaecology, St. George's Hospital Medical School, University of London, London, UK, ‡King's College, University of London, UK and §Department of Electrical Engineering, ESAT-SISTA, Katholieke Universiteit Leuven, Belgium*

The parameters used in the Simple Rules are based on the terms and definitions as published by the IOTA group (Timmerman D, et al. Ultrasound Obstet Gynecol 2000;16:500-505.).

This had led to further studies including the ROCKeTS (Refining Ovarian Cancer Test Accuracy Scores - ongoing).

BMJ

RESEARCH

Simple ultrasound rules to distinguish between benign and malignant adnexal masses before surgery: prospective validation by IOTA group

Dirk Timmerman, professor in obstetrics and gynaecology ,[1] Lieveke Ameye, postdoctoral researcher in biostatistics,[2] Daniela Fischerova, consultant gynaecologist,[3] Elisabeth Epstein, associate professor in obstetrics and gynaecology,[4] Gian Benedetto Melis, professor in obstetrics and gynaecology,[5] Stefano Guerriero, associate professor in obstetrics and gynaecology,[5] Caroline Van Holsbeke, consultant gynaecologist,[6] Luca Savelli, consultant gynaecologist,[7] Robert Fruscio, consultant gynaecologist,[8] Andrea Alberto Lissoni, consultant gynaecologist,[8] Antonia Carla Testa, assistant professor in gynaecology,[9] Joan Veldman, research fellow in gynaecology,[1] Ignace Vergote, professor in obstetrics and gynaecology,[1] Sabine Van Huffel, professor in biomedical data processing,[2] Tom Bourne, consultant gynaecologist,[10] visiting professor in obstetrics and gynaecology,[1] Lil Valentin, professor in obstetrics and gynaecology[11]

Cite this as: *BMJ* 2010;341:c6839
doi:10.1136/bmj.c6839

BMJ | ONLINE FIRST | bmj.com

The manuscript describing the Simple Rules is published in Ultrasound in Obstetrics and Gynaecology, Timmerman et al, 2008.

WHAT IS ALREADY KNOWN ON THIS TOPIC

Preoperative characterisation of adnexal tumours determines the management of the patient, and appropriate management determines the prognosis

Subjective assessment of ultrasound examination is the most reliable method to distinguish between benign and malignant adnexal masses before surgery, but it requires expertise

Simple rules have been proposed to discriminate between benign and malignant masses, but they require external validation

WHAT THIS STUDY ADDS

The simple rules were conclusive in about 75% of adnexal masses

When conclusive, they performed as well as subjective assessment by an experienced examiner for discrimination between benign and malignant masses

Their use may change clinical practice by providing an accurate instant classification of most adnexal masses while reducing the number of patients that need to be referred for expert scanning

What the simple rules can't do…….

- The simple rules cannot replace training and experience in ultrasonography.
- The simple rules cannot compensate for poor quality of ultrasound equipment.

The International Ovarian Tumour Analysis criteria - IOTA

- Preoperative classification system for ovarian tumours consisting of:

- 5 features typical for benign tumours (B-features).

- 5 features typical for malignant tumours (M-Features).

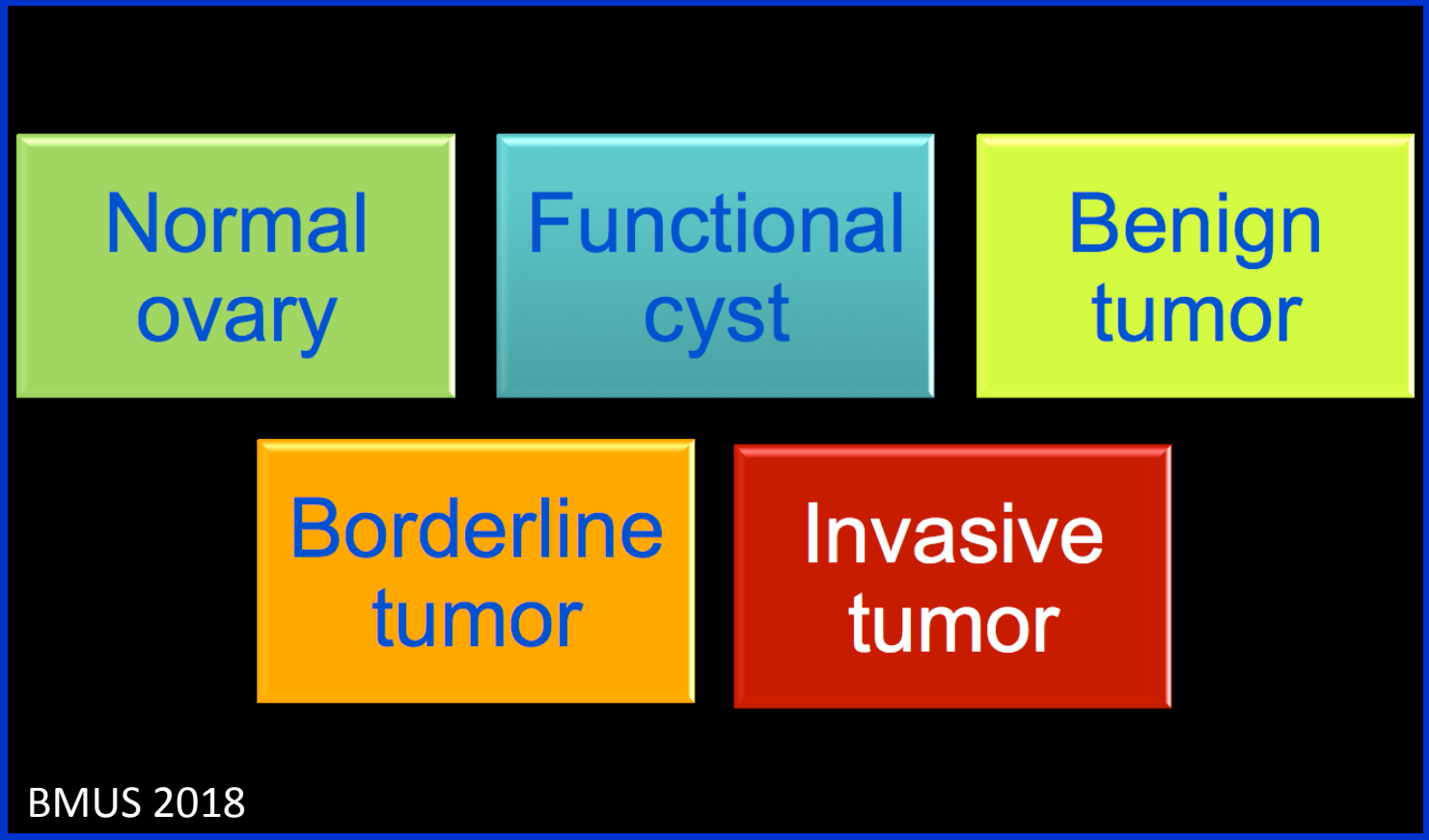
- Based on which of the **B-features** and **M-features** that apply, tumours can be classified as benign, malignant or inconclusive:

- Benign – only B Features

- Malignant – only M Features

- Inconclusive – no features apply or both B- and M-features apply.

The simple ‘Ultrasound’ rules



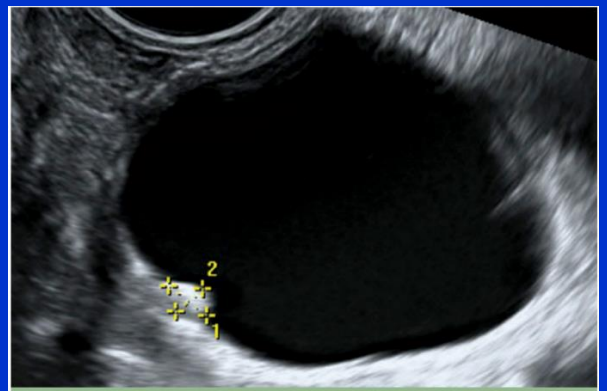
Ultrasound reports categorising adnexal masses → Helps with patient referral pathways → Helps to reduce unnecessary patient anxiety

Benign features

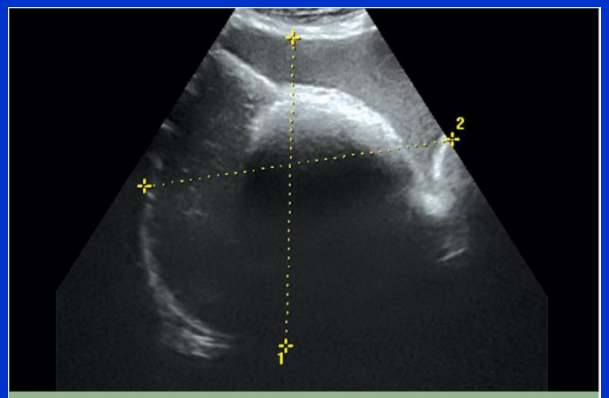
U/S report: ….as per IOTA simple rules these are benign features.

Using IOTA a mass is classified as **benign** if at **least one B-Feature is present** and no M-features are present.

B1: Unilocular cyst

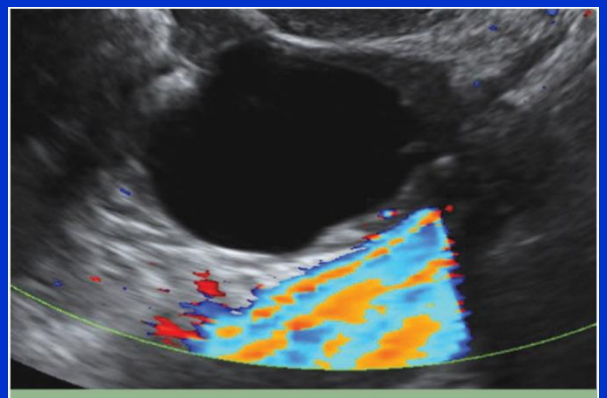


B2: Presence of solid components, with largest diameter < 7 mm



B3: Presence of acoustic shadows

B4: Smooth multilocular tumor, with largest diameter < 100 mm

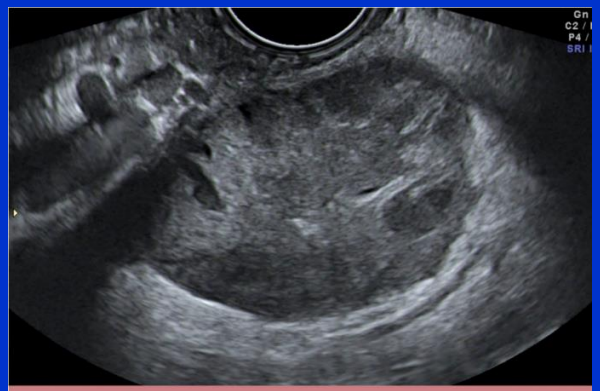


B5: No blood flow (color score 1)

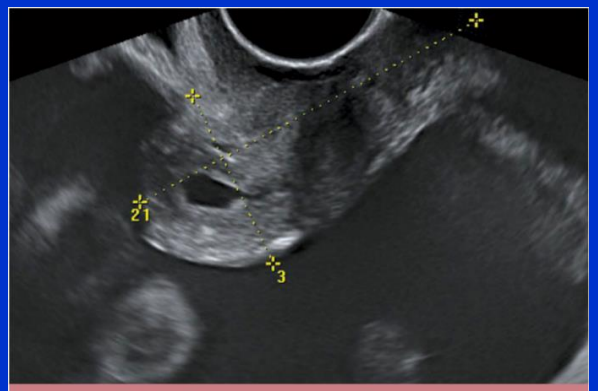
Malignant features

U/S report:….as per IOTA simple rules these are malignant features.

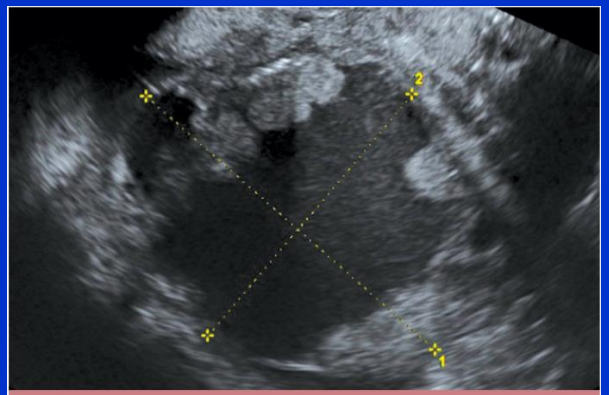
Using **IOTA** Rules a mass is classified as **malignant if at least one M-feature is present** and no B-features are present.



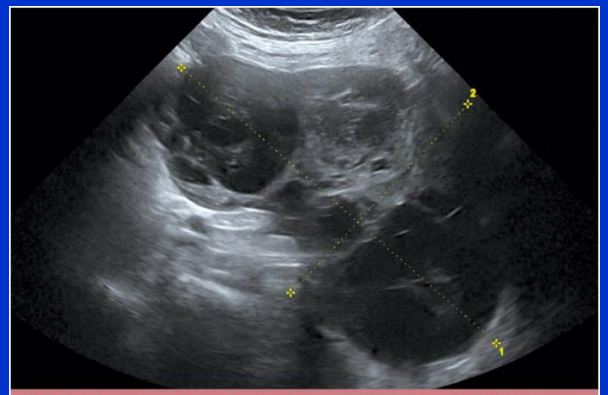
M1: Irregular solid tumor



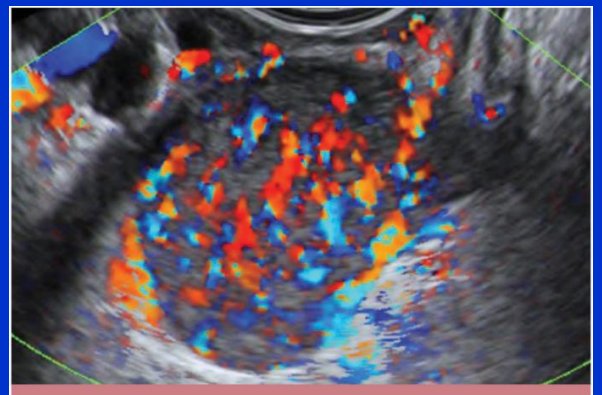
M2: Presence of ascites



M3: At least four papillary structures



M4: Irregular multilocular solid tumor with largest diameter ≥ 100 mm



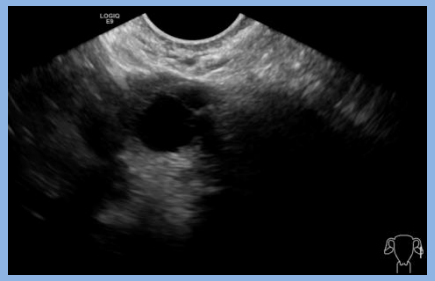
M5: Very strong blood flow

The Rules

- **Rule 1:** If one or more M features are present in the absence of B feature(s), the mass is classified as malignant.
- **Rule 2:** If one or more B features are present in the absence of M feature(s), the mass is classified as benign.
- **Rule 3:** If both M features and B features are present, or if no B or M features are present, the result is inconclusive and a second stage test is recommended.

Conclusion

- When the rules are applied it makes it much easier to classify ovarian tumours.
- Studies have found that when the simple rules were applied they were conclusive in approximately **75% of adnexal masses**, therefore approximately **25% indeterminate** = ↓fast track referrals to gynaecology, ↓ patient anxiety in benign cases. Several trials are ongoing which will be used to validate this system (ROCKeTS).
- It will probably change the way ultrasound scans are reported in the future, which in turn will help with patient referral pathways and also help reduce unnecessary patient anxiety.
- *…….back to the ultrasound report example, if IOTA rules were applied in this case…..*



B4 – smooth multilocular tumour with largest diameter <100mm

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Normal right ovary.
No free fluid.

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..... End of Report .....

Was the urgent gynaecology referral necessary?

IOTA 2018
International Ovarian Tumor Analysis

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Welcome

IOTA Fourth International IOTA Congress
Leuven, Belgium – April 18-19, 2019
www.iotagroup.org

Information about IOTA

The International Ovarian Tumor Analysis (IOTA) group was founded in 1999 by Dirk Timmerman, Lil Valentin and Tom Bourne. Its first aim was to develop standardized terminology. In 2000, IOTA published a consensus statement on terms, definitions and measurements to describe the sonographic features of adnexal masses, which is now widely used. IOTA now covers a multitude of studies examining many aspects of gynecological ultrasonography within a network of contributing centers throughout the world that are coordinated from KU Leuven.

Having agreed on standardized terminology, the principal IOTA investigators from different centers prospectively collected a large cohort of patients with a persistent adnexal mass. Accurate preoperative discrimination between benign and malignant adnexal masses is known to be of pivotal value in clinical practice. Research has focused on the development of predictive models to estimate the risk of malignancy. This database and the close involvement of the civil engineering department at KU Leuven has enabled both previously developed prediction models to be tested and novel prediction models to be developed and externally validated.

IOTA developed the simple rules and mathematical models based on logistic regression (LR 1-2), which are very easy to use in clinical practice to estimate the risk of malignancy. These models were prospectively and externally validated, and proved to have very good performances, close to that of subjective assessment of an expert sonographer. Moreover, these models keep to be performing well by users with different levels of ultrasound experience. Recently, with publication of the ADNEX-model, the first predictive multiclass model was introduced, able to differentiate between four subgroups of malignant tumors.

Currently IOTA is engaged in several new studies. The group is investigating the long-term behavior of expectantly managed adnexal pathology (IOTA phase 5). This will answer important questions about complications and malignant transformation in masses that are left in situ.

Latest News

IOTA Course in Budapest, Hungary

IOTA Course in Beijing, China with Prof. T.Bourne and Dr. W. Froyman

IOTA Course in Dhaka, Bangladesh with Mala Sibal

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