

PREOPERATIVE RISK ASSESSMENT OF ADNEXAL MASSES USING SIMPLE RULES FROM INTERNATIONAL OVARIAN TUMOR ANALYSIS [IOTA] GROUP

Dr. Kurra Jayasri, Dr. Pendyala Sujata



Introduction :

In gynecological practice, the first investigation done in patients with complaints of pain abdomen or with palpable/ suspected abdominal mass is Ultrasonography.¹The subjective evaluation of the findings in an ultrasound is the best method to differentiate between malignant and benign adnexal masses when performed by an ultrasound examiner with sufficient experience.²⁻³As such experience is difficult to come by, the IOTA study had tried to develop algorithms for diagnosis, which aid physicians in differentiating adnexal pathology, without depending on the expertise of the physician.

Rules for predicting a malignant tumor [M-rules]	Rules for predicting a benign tumor [B-rules]
M1- Irregular solid tumor	B1- Unilocular
M2- Presence of ascites	B2- Presence of solid components where the largest solid component has a largest diameter < 7mm
M3- At least four papillary structures	B3- Presence of acoustic shadows
M4- Irregular multilocular solid tumor with largest diameter ≥ 100mm	B4- Smooth multilocular tumor with largest diameter < 100mm
M5- Very strong blood flow [color score 4]	B5- No blood flow [color score 1]

Aim of the study :

The aim of this study is to predict the risk of malignancy using ultrasonography in adnexal masses based on the simple rules given by IOTA group and to evaluate the diagnostic performance of IOTA simple rules in differentiating between benign and malignant ovarian tumors and their correlation with histopathological study.

Materials and Methods :

A prospective observational study was conducted in which total of 76 cases were enrolled presenting with adnexal masses, admitted in department of obstetrics and gynaecology, over a period of 1year 6months, after formal written consent.

Inclusion criteria :

- Women who presented with adnexal masses willing for surgery.

✓ In case of bilateral adnexal masses, we include the mass with the most complex ultrasonic morphology.

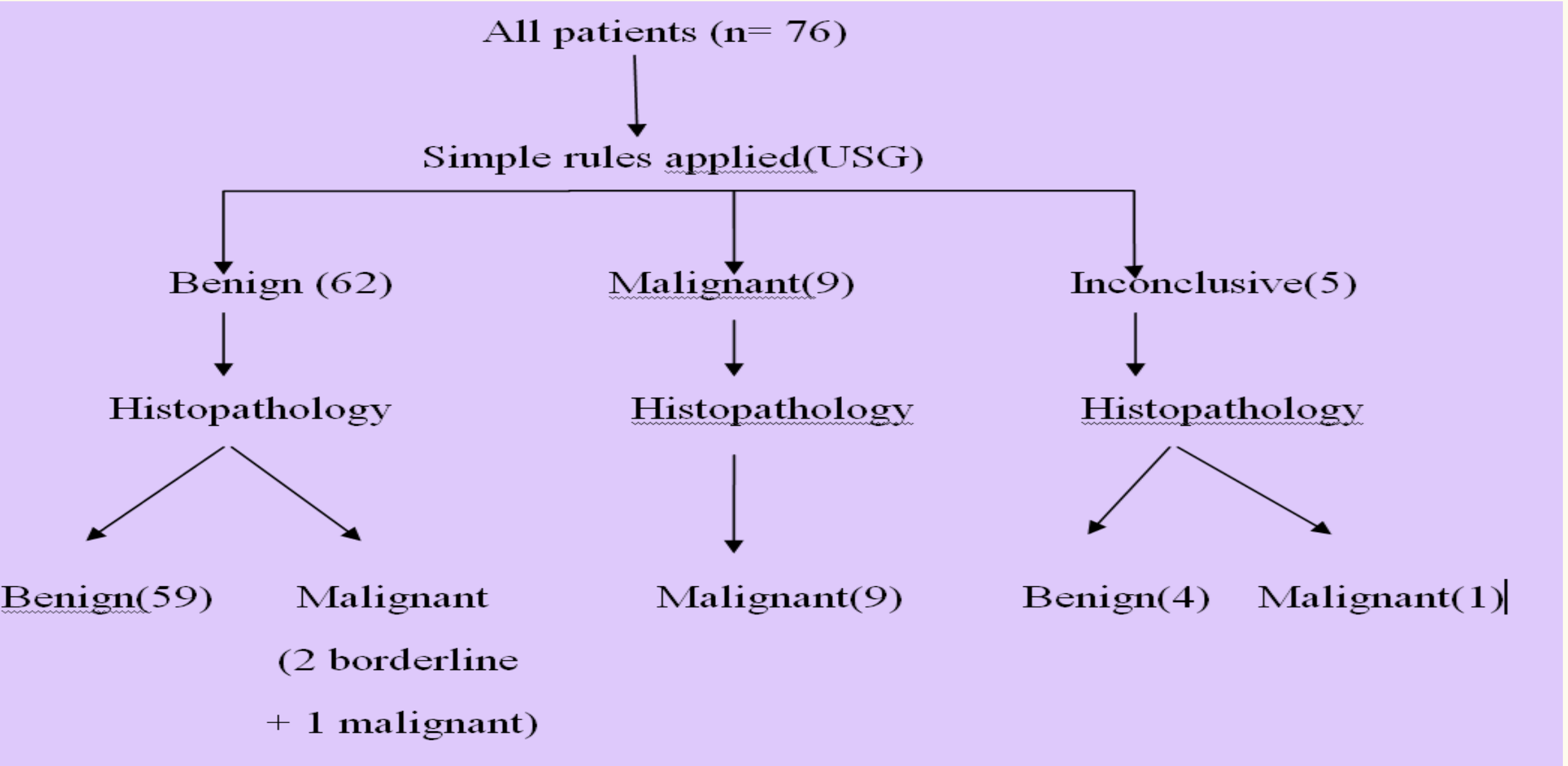
✓ If both the masses have similar ultrasonic morphology, we include the largest one or the one most easily accessible by Trans abdominal/Trans vaginal ultrasound.

- Patients who have given informed consent

Exclusion criteria :

- Pregnancy at the time of examination.
- Refusal for USG
- Surgical intervention >120 days after the ultrasound examination

Results:



Ultrasonographic features [IOTA rules]	Histopathological study
B3+M1+M4+M5	Broad ligament fibroid
B3+M3+M4+M5	Serous cystadenocarcinoma
B4+B5+M2	Mature cystic teratoma
B5+M1+M2	Serous cystadenoma with torsion
B3+M2+M4+M5	Mature cystic teratoma

✓ Comparison of Ultrasonography and Histopathology findings in inconclusive cases

✓ The percentage of inconclusive results was 6.7%.

✓ Among the inconclusive cases 4 were benign and one was malignant according to histopathology study

	Benign cases	Malignant cases
Sensitivity	93.7%	81.8%
Specificity	76.9%	97%
Positive predictive value	95.2%	86%
Negative predictive value	71.4%	97%

✓ The analysis of IOTA SR (benign features) in our study shows high sensitivity and relatively low specificity (93.7% and 76.9% respectively), and the IOTA SR (malignant features) shows 81.8% sensitivity and 97% specificity

Discussion:

✓ The mean age for benign and malignant cases was 33.7 and 47.0 years

✓ Out of 76 cases sent for USG analysis, 62(81.6%) were benign, 9 were malignant and 5 were Inconclusive. According to the histopathological analysis 63(82.8%) were benign, 13(17.1%) were malignant. These findings are similar to the study by Ameye et al⁴, where in 74% were benign and 26% were malignant

✓ In a study conducted by Timmerman et al⁵, among benign tumors the most predictive feature was B1(Unilocular cyst), while the least predictive feature was B3(Presence of acoustic shadows) which is different when compared to our study i.e feature B5 (no Doppler blood flow- color score 1) was most predictive of a benign tumor 82.9% and feature B2 (presence of solid component <7mm) was least predictive.

✓ And regarding the malignant tumors in our study M5 (very strong blood flow) was the best predictive feature and M3 (presence of papillary projections) was the least predictive feature while the most predictive feature was M2 (presence of ascites) and the least predictive feature was M4 (irregular multi-locular solid tumor with largest diameter ≥100mm) according to study by Timmerman et al.⁵

✓ Histopathology study of the benign category in our study shows that serous cystadenoma accounted for about 30.1% of cases followed by mature cystic teratoma 23.8% and endometriotic cyst 17.4%. These findings are almost similar to the studies of Ameye et al⁴ (endometrioma > teratoma > serous cystadenoma)

✓ Similarly histopathology study of the malignant tumors in our study revealed 76.9% of the malignant tumors are of epithelial in origin, which is corresponding to studies conducted by Granberg⁶ and Aslam et al⁷ where the epithelial carcinoma cases accounted for about 80-90% of all ovarian cancers.

✓ The percentage of inconclusive results in our study is 6.7%, Likely the rate of inconclusive results was 10% in other study by Garg S. ⁸

✓ The sensitivity and specificity results in our study are similar to study conducted by Timmerman D et al., ⁹ and Alcazar JL et al., ¹⁰

Conclusion:

IOTA simple rules are considered to have a high diagnostic accuracy to discriminate adnexal masses even when performed by non-expert sonographer after a course of training. The simple ultrasound rules given by IOTA group are highly sensitive and specific in predicting ovarian malignancy. So, a classification system based on these 10 simple ultrasound rules of IOTA can form the basis of management of adnexal masses.

Bibilography:

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