

'Simple Rules' Can Help Classify Ovarian Tumors

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CHICAGO — Most adnexal tumors can be classified as benign or malignant by transvaginal gray-scale ultrasound and Doppler ultrasound based on the use of 10 simple rules, according to a prospective multicenter study of 1,938 patients.

The rules enabled less experienced ultrasound examiners to perform as well as highly experienced examiners in distinguishing benign and malignant masses, reported Dr. Dirk Timmerman at the World Congress on Ultrasound in Obstetrics and Gynecology.

The sensitivity of ultrasound pattern recognition and the simple rules was 91% and 92%, respectively, and the specificity was 96% and 96%, said Dr. Timmerman, professor of obstetrics and gynecology and clinical head of ultrasound at University Hospitals Leuven (Belgium).

"We have been looking for more objective ways to help ultrasound examiners" distinguish benign and malignant tumors,

'Simple rules are rather easy to learn, whereas [pattern recognition] takes a long time to learn and is not easily transferred to others.'

Dr. Timmerman said in an interview. "Simple rules are rather easy to learn, whereas subjective assessment [pattern recognition] takes a long time to learn and is not easily transferred to others."

Researchers found 545

(28%) malignancies among the 1,938 patients with adnexal masses at 19 centers. The rules were applicable to 1,501 (77%) of patients and had a positive likelihood ratio of 21.29 and a negative likelihood ratio of 0.08.

The rules include five to predict malignancy (M-rules) and five to predict a benign mass (B-rules).

The M-rules are the following:

- ▶ Irregular solid tumor.
- ▶ Ascites.
- ▶ At least four papillary structures.
- ▶ Irregular multilocular-solid tumor with a largest diameter of at least 100 mm.
- ▶ Very high color score using color Doppler.

The B-rules are the following:

- ▶ Unilocular cyst.
- ▶ Presence of solid components, where the largest solid component is less than 7 mm in largest diameter.
- ▶ Acoustic shadows.
- ▶ Smooth multilocular tumor less than 100 mm in largest diameter.
- ▶ No detectable blood flow at Doppler examination.

Dr. Timmerman said that this phase II study provides additional large-scale evidence of the sensitivity and specificity of the rules, which were first published in May by the International Ovarian Tumor Analysis study group (IOTA), a consortium of European medical centers (*Ultrasound Obstet. Gynecol.* 2008;31:6:681-90).

In that phase I study, 1,066 patients with 1,233 adnexal tumors at nine centers underwent transvaginal gray-scale and Doppler ultrasound examination. Researchers collected 42 gray-scale ultrasound variables and six Doppler variables, and determined the variables or combinations of variables with the highest and the lowest positive predictive value for malignancy. They selected 10 rules consistent with their clinical experience that were applicable to at least 30 tumors, and

tested those rules prospectively on 507 tumors in three centers.

For the phase II study, Dr. Timmerman and his colleagues assessed two additional variables (the presence of acoustic streaming and ovarian crescent sign) next to several clinical variables, such as pain during examination, he noted.

In the phase I study, the 10 rules were applicable to 76% of all tumors, in which they showed a sensitivity of 93%, a specificity of 90%, a positive likelihood ratio of

9.45, and a negative likelihood ratio of 0.08. In addition, the rules were applicable to 76% (386/507) of the prospectively tested tumors, with a sensitivity of 95%, a specificity of 91%, a positive likelihood ratio of 10.37, and a negative likelihood ratio of 0.06.

Dr. Timmerman said phase III of IOTA will test optimal second-stage tests for difficult tumors, such as ultrasound contrast agents and 3-D power Doppler examination. ■



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