Three-dimensional ultrasound in the assessment of adnexal masses

An Essay

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بسم الله الرحمن الرحيم

﴿قَالُواْ سُبحَانَكَ لا عِلمَ لَنَا إِلا مَا عَلمتنا
إِنكَ أَنتَ العَلِيمُ الحَكيمُ﴾

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مقدم توطئة للحصول علي درجة الماجستير في الاشعة التشخيصية

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		ovarian malignancy.

List of Abbreviations

Abbreviation	Stands for
2D	Two-Dimensional
2D US	Two dimensional ultrasonography
3D US	Three dimensional ultrasonography
3D	Three dimensional
3DPD	Three dimensional power Doppler
4D	Four dimensional
AFP	Alfa fetoprotein
CA125	Cancer antigen 125
CDI	Color Doppler imaging
CDS	Color Doppler sonography
CL	Corpus luteum
Cm	Centimeter
Cm3	Cubic centimeter
CT	Computed tomography
EP	Ectopic pregnancy
g	grams
HC	Haemorrhagic cyst
hCG	Human chorionic gonadotropin
PCO	Polycystic ovarian disease
PDI	Power Doppler imaging
PID	Pelvic inflammatory disease

ROI	Region of interest
STIC	Spatiotemporal image correlation
TGC	Time gain compensation
TRUS	Transrectal ultrasonography
TUI	Tomographic ultrasound imaging
TVCD	Transvaginal color Doppler
TVUS	Transvaginal ultrasound
US	Ultrasound
VBS	Vascular bridging sign
VCI	Volume contrast imaging .
VOCAL	Virtual organ computer aided analysis Volume calculation

Introduction and aim of the work

Introduction

A pelvic mass might be found in a woman presenting with various gynecological complaints, in which case it might or might not be related to her symptoms. It might also be an incidental finding in a woman with no gynecological problems. Whatever the case, a pelvic mass usually raises anxiety, because it may be a malignancy. Therefore, imaging methods particularly ultrasound are often used to help make a correct diagnosis, so that appropriate treatment can be chosen. ***(L. Valentin, 2006)***

The preoperative assessment of an adnexal mass is still a diagnostic challenge. Accurate preoperative assessment for presence of malignancy facilitates an optimal choice for surgery. Optimal surgical staging and cytoreductive surgery are of utmost importance in case of malignancy. At present, several parameters are available to distinguish benign and malignant masses. Age, menopausal state, CA-125 level, two-dimensional (2D) gray scale and power Doppler parameters are all known to contribute to preoperative diagnosis. These parameters have been combined in diagnostic models. Although initial publication reported an almost perfect performance of these models, external validation showed their diagnostic performance to be less optimal. ***(Peggy et al., 2007)***

The accuracy of 2D ultrasound proved by some authors is not sufficient to avert surgery, morphological analysis of adnexal masses with ultrasound helps narrow the differential diagnosis, determining the degree of suspicion for malignancy. Selective use of 3D ultrasound and power Doppler angiography could be used to better characterize adnexal tumors. Detailed 3D sonography may help to identify women who, if needed, may have less invasive surgical procedure such as laparoscopy or be referred to a gynecological oncologist. ***(Laban et al., 2007)***

Three-dimensional power Doppler sonography (3DPD) is helpful in depicting overall vessel density and branching patterns within an intratumoral abnormality, as the presence of central intratumoral vascularity increases the suspension of malignancy. This technique seems to be useful in distinguishing benign from malignant ovarian masses. Combined morphological and vascular imaging obtained by 3D ultrasound with 3D power Doppler appears to further improve the preoperative assessment of adnexal masses. ***(Fleisher et al., 2005)***

Aim of the work

This essay is designed to assess the role of three-dimensional ultrasound in the evaluation of adnexal masses.