VALUE OF IMAGING TECHQUINES IN MANAGEMENT OF GYNECOLOGICAL PELVI-ABDOMINAL MASSES

An Essay Sumitted for the partial Fulfillment of the Master Degree in Obestetrics and Gynecology

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Abstract

Pelvi-abdominal masses are considered as a group of the most common diseases in gynecology especially adnexal masses and ovarian tumors which represent two thirds of these cases. 2D ultrasound has become the main diagnostic tool in obstetric and gynecology. 3D ultrasound, color Doppler in addition to hysterosalpingography, sonohysterography, computed tomography and magnetic resonance imaging can help in the assessment of pelvi-abdominal masses. This essay shows the role of the previously mentioned tools in assessment of pelvi-abdominal masses it was found that clinical picture has the lowest sensitivity to predict malignancy, there is no great difference between 2D and 3D ultrasound assessment however combination of both is better than either alone.

Color Doppler study, hysterosalpingography, sonohysterography, computed tomography and magnetic resonance imaging can improve the assessment of gynecological pelvi-abdominal masses and differentiation between benign and malignant masses.

Key wards :

Pelvi-Abdominal masses - 2D Ultrasound - 3D Ultrasound - Color Doppler study- Hysterosalpingography- Sonohysterography- Computed tomography - Magnetic Resonance Imaging.

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Dedication

My Mother, Father

My Husband

My lovely daughter Jana

My Sisters

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2D U/S	***Two dimensional ultrasound***
3D U/S	***Three dimensional ultrasonography***
CT	***Computed tomography***
HCG	***Human chorionic ganadotrophin***
HL	***Hyper reaction luteinalis***
HSG	***Hysterosalpingography***
MRI	***Managnatic resonance imaging***
PCOD	***Polycystic ovarion disease***
PICs	***Peritoneal inclusion cysts***
PID	***Pelvic inflammatory disease***
S/D	***Systolic diastolic ratio***
S/H	***Sonohysterography***
TAS	***Transabdominal sonography***
TOA	***Tubo- ovarian abcess***
TVS	***Transvaginal sonography***
UFE	***Utrine fibroid emblization***

Introduction

Gyncological pelvi-abdominal masses present an increasing challenge to the physician and ovarian cancer is the most lethal of all gynecological cancers, presenting late and responding poorly to treatment ***(Jacobs et al., 1996)*** malignant ovarian tumor are the third most common cause of cancer death in women ***(Sparks and Varner, 1991)***

Gyncological pelvi-abdominal masses often discovered as an accidental finding for other indications or is preoperatively evaluated for symptomatic patients on ultrasonography computed tomography (C.T) or magnetic resonance (MR) imaging .

MR imaging has been considered the best imaging technique for detection , localization and characterization of gynecological neoplasms because of its super contrast of soft tissue and its multiplanar capability without radiation hazard ***(Park et al., 2003)***

Most women with ovarian cancer have no symptoms for long periods of time. When symptoms develop, they are often vague and non-specific. In early stage disease, the patient may experience irregular menses if she is premenopausal. If a pelvic mass is compressing the bladder or rectum, she may report urinay frequency or constipation. Occasionally, she may perceive lower abdominal distension, pressure, or pain, such as dyspareunia. Acute symptoms, such as pain secondary to rupture or torsion, are unusual ***(Olson et al., 2001).*** Moreover, in advanced stage disease, patients most often have symptoms related to the presence of ascites, omental metastases, or a bowel metastases. The symptoms include abdominal distension, bloating, constipation, nausea or anorexia. Premenopausal women may complain of irregular or heavy

menses, whereas vaginal bleeding may occur in postmenopausal women ***(Olson et al, 2001).***

Because the patient usually complains of abdominal symptoms, she may not have a pelvic examination, and a tumor may be missed. A variety of benign conditions of the reproductive tract, such as pelvic inflammatory disease, endometriosis, and pedunculated uterine leiomyoma, can simulate ovarian cancer. Non-gynecologic causes of an adnexal mass, such as inflammatory disease or neoplastic colonic mass or even a pelvic kidney can simulate ovarian cancer ***(Berek ,2000).***

A careful history taking and pelvic examination is an important step for the diagnosis, however, the diagnostic accuracy of pelvic examination varied in different series between 50% and 90%. It is affected by several variables including the experience of the gynecologist, the type of the patient and the characteristics of the mass. Several factors may hinder the diagnosis, even for an experienced gynecologist,virginity, obesity, associated pregnancy, ascites and pelvic tenderness ***(Roman et al., 1997).***

Many diagnostic procedures have been used for a thorough evaluation of such cases, among them ultrasonography is a currently used tool for the diagnosis. The information about the likelihood that the mass is benign or malignant is important because it will affect the clinical management and the therapeutic approach.

Ultrasound examination for the prediction of malignancy in an ovarian mass has been limited by the lack of cut off criteria for evaluation of such masses but with the advent of high frequency transvaginal ultrasonography and 3D ultrasonography, new opportunities are presented in characterization of ovarian masses together with closer proximity to pelvic vessels. ***(Stein et al., 1995).***

Further improvement in diagnostic accuracy is expected following increasing knowledge about 3D ultrasonography and the recent development of real-time 3D ultrasonography ***(Chan et al., 1997)*** since the diagnosis and appropriate therapeutic approach for patterns with ovarian tumors depend to a crucial degree on sonographic data ***(Weber et al., 1997).***

Previous studies have shown that color Doppler ultrasonography may be able to detect neovascularization in some tumors of the ovary and together with a low resistance to blood flow, enabled the prediction of malignancy ***(Fleischer et al., 1993)***

The observations made in the late 1980s indicated that the transvaginal color Doppler ultrasonography can be used in the detection of ovarian cancer and has generated a stream of clinical trials. However, the conflicting results of numerous publications have led to major controversy. Transvaginal color Doppler ultrasonography saves time and increases the accuracy of measurements, though masses over 10 cm in size are best evaluated using conventional transabdominal sonography.

The most important advantage of this technique is the display of blood flow across the entire scanning plane of the pelvis. Therefore pulsed Doppler sample volume can be placed accurately on the area of interest using the guidance of the color flow, and spectral wave form analysis can be done easily, as each vessel imaged by color Doppler can be explored by pulsed Doppler and flow can be assessed without interference from other vessels lying distally, or in close proximity to the same axis of investigation and having a different circulatory patterns and hence color Doppler seems to produce a better characterization of pelvic tumor vascularity than any other current available diagnostic method ***(Kurjak et al., 1989).***

Hysterosalpingography (HSG) is a valuable technique in evaluating the uterus and fallopian tubes. Although other diagnostic tools such as MR imaging, hysteroscopy, and laparoscopy have important roles, HSG is considered to be a valuable screening procedure for infertility workup. HSG remains the main examination for the evaluation of the fallopian tubes. Contrast material introduced into the uterus through the cervical canal outlines the inner cavity of uterus and tubes. Spill of contrast material into the peritoneal cavity reveals the patency of fallopian tubes. ***(Kim ,2003)***

Sonohysterography. which is the new sonographic imaging of the uterus and uterine cavity distended with saline or contrast agents under continuous transvaginal ultrasound (US) visualization, More recently, color Doppler sonohysterography has been used to assist in the diagnosis of endometrial abnormalities by clearly depicting vessels within the lesions.***(Fleischer and Shappell ,2003)***

Clinical indications for sonohysterography include abnormal uterine bleeding in premenopausal and postmenopausal women, infertility, and patients with hormone replacement and tamoxifen therapy. Abnormal transvaginal sonographic findings that need to be evaluated for sonohysterography include a diffuse or focal thickening and irregularity of the endometrial interface; a poorly defined or not identifiable endometrium; interruption of endometrial echo by a polypoid mass; or the presence of a leiomyoma of indeterminate location.***(Sohaey and Woodword ,1999)***

Although ultrasonography (US) is the most commonly used primary imaging modality of the female pelvis, computed tomography (CT) and magnetic resonance (MR) imaging play essential roles in the evaluation of gynecologic diseases. With advent of mtiltidetector CT,

faster scanning during optimal vascular opacification is now available, which may improve the accuracy in the detection and staging of gynecologic diseases. Owing to multiplanar capability and excellent tissue contrast, however, MR imaging is the preferred imaging modality of the female pelvis in many instances, particularly for the staging of malignant gynecologic diseases.***(Walsh ,1992)***