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What the Gynecologist expect from Ultrasounds

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Introduction

Diagnostic medical ultrasound was first developed in the 1960s but it did not become part of routine clinical practice until the late 1970s. TVUS was introduced in the 1980s and it has expanded rapidly because of the improved quality of pelvic imaging provided bu high frequency transducers (5-7 Hz).

It is generally accepted that ultrasound is the most important and primary tool in Gynecology. It represents essential part of the diagnostic process in examining the female pelvis and the first investigation for the majority of relative symptoms. Emphasis must be given in how to maximize image quality and how to recognize normal and pathologic features.

Ultrasound is a part of the patient management. The combination of technical ability and clinical knowledge have as a result better and increased diagnostic capability. Therefore, if we bring together scan findings and clinical scenario, the result is the improvement of patient care. Sincethe female reproductive organs experience physiological changes through the influence of hormones must be taken into consideration.The image appearance on U/S is combined with the age, the menstrual date and the hormonal status of the woman.

The object of the scan is to examine the reproductive organs and also other structures such as muscles, vessels, ligaments, rectum, sigmoid, bladder and ureters. Before a scan, a complete medical history is necessary, because irrelevant scan findings may lead to inappropriate management of the patient. Thus, it is necessary the understanding of the information in order to manage the patient properly. The examiner must have the experience to define if the abnormality is responsible for the symptoms or if it is an incidental finding. Each request of an ultrasound demands clinical information and a full clinical history, medical and surgical. At the end a structured report is mandatory including biographical details of the patient, ultrasound findings (normal, abnormal), definitive or differential diagnosis.

Discussion

Why the gynecologists request ultrasounds? The answer is that the investigation will help in diagnosis and patient management. As in all clinical areas, examination skills are being lost or open to marked interobserver variation, resulting in greater reliance on investigations as a substitute. Abuse of investigations with requests made with little thought as to how the investigation will help in dx or management. Of course, the ultrasound should in no way replace clinical examination or clinical assessment, but assists in building the clinical picture to contribute to appropriate patient management.

The bimanual examination is inappropriate in patients with obesity, intact hymen and postmenopausal patients and will not eliminate the use of invasive investigations (hysteroscopy, laparoscopy, abdominal surgery).

Concerning transabdominal scan (TA), it gives us the ability to encompass a comparatively large field of view[1]. Assessing the entire pelvis or the abdomen for evaluating large structures or disease that spread intra-abdominally is also an essential assistance of transabdominal ultrasound. TA helps us also locating the ovaries in relation to uterus, demonstrating large masses (fibroid uterus, adnexal masses, pelvic collections), iliac fossae, bladder and associated renal pathology and uterine anomalies, such as bicornuate uterus[1].

As for transvaginal scanning (TV), it represents the first line technique for imaging the female pelvis, assessing uterus and adnexae[2]. Transvaginal scanning (TV) offers reduced distance between the probe and the organs and the examination is closer to the target. Furthermore, there is the benefit of lack of layers of subcutaneous tissue, which gives us further resolution. On the other hand, the field of view is smaller and large masses will lie outside the field of view. Thus, reduced flexibility in the available planes of scan, could make measurements less easy. Additionally, transvaginal scanning (TA) gives us the ability to use high frequency probes in order to provide the best anatomic detail[2]. Always we are obliged to exist a consent to the procedure and should be very careful with virginal patients and with the discomfort provoked by probe insertion. Alternative approaches for imaging the female pelvis are transperineal, translabial and transrectal sonography.

Table 1. Causes of abnormal uterine bleeding

Organic	**Iatrogenic**
Uterine	Intrauterine contaceptive device
Fibroids	Anticoagulands
Endometriosis	Progesterones
Adenomyosis	Obesity
Endometrial/ cervical polyps	
Pelvic inflamatory disease	
Endometrial hyperplasia/ malignancy	
Coagulopathies	
Congenital deficiencies	
Thrombocytopenia	
Leukaemia	
Systemic disorders	
Hypothyroidism	
Systemic lupus erythromatosis	
Chronic liver failure	

The use of ultrasound helps us to make the differential diagnosis of a possible pregnancy. Which gynecological patients require an ultrasound? Those who have symptoms related to “period problems” (abnormal uterine bleeding), infertility problems, problems related to pelvic masses, pelvic pain and evaluation of pelvic anatomy in the presence of a limited clinical examination.

In the case of abnormal uterine bleeding (AUB), we have to investigate women with a history of abnormal uterine bleeding. Ultrasound offers a clear view of myometrium and endometrium, the detection of clinically significant lesions (fibroids, polyps)

and the differential diagnosis of focal endometrial lesions (saline infusion sonography)[3].

The abnormal uterine bleeding is classified to regular/irregular bleeding, intermenstrual bleeding and postmenopausal bleeding. Causes of abnormal uterine bleeding are organic and iatrogenic.

The causes of postmenopausal bleeding are gynecological and non-gynecological.

The ultrasound is not able to beused in all cases of abnormal uterine bleeding. Unfortunately, there is a limitation and an inability to define the presence, location and character of any given abnormality reliably, sincethe sensitivity of U/S reaches the 75% sometimes[3].

Concerning the fertility assessment, ultrasound may support further investigation of congenital uterine malformations, submucous fibroids, tubal damages such as hydrosalpinx, adhesions (organs not freely mobile against each other), tubal patency (hysterocontrast sonography), follicular development and ovulation in spontaneous and stimulated cycles[4].

As for pelvic masses, ultrasound examination evaluation a palpable or clinically suspected pelvic mass and differential diagnosis of malignant and benign masses[5,6]. Pelvic pain is separated toacute and chronic pelvic pain. Ultrasound permits us a quick non-invasive assessment of the pelvis and abdomen[7]. It is the first line investigation of patients with pelvic pain to confirm or exclude the provisional diagnosis based on clinical examination[7]. CT and MRI scan are the next step for the confirmation of the ultrasound diagnosis.

Another domain where the gynecological ultrasound is very useful is the early pregnancy assessment[8]. The detection of a normal intrauterine pregnancy, the location and the viability are the most important information of the ultrasound assessment[9]. Early pregnancy complications need further plan management.

Table 2. Causes of postmenopausal bleeding

Gynaecological (96%)	**Non-gynaecological (4%)**
Malignant (12%)	Per rectum or per urethram bleeding, from gastrointestinal or genitourinary tract pathology, may be mistaken for per vaginam bleeding in a minority of cases
Primary tumours	
Secondary tumours	
Benign (88%)	
Atrophical genital changes	
Exogenous/endogenous Oestrogen	
Benign tumours	
Infection	
Injuries	

The role of ultrasound in the gynecologic oncology includes the differential diagnosis of uterine and ovarian lesions and the assessment of gynecological cancers.

Last but not least the paediatric gynecological ultrasound, it is helpful to diagnose neonatal pathology such as ovarian cysts, vaginal bleeding, hydrocolpos, hydrometrocolpos, ambiguous genitalia and determination whether a uterus is present[10]. Concerning the premenarchal girls, the most frequent symptoms where the ultrasound may evaluate are the vaginal bleeding, the discharge and the pelvic masses. Finally, ultrasound helps us diagnosing multiple pathologies such as genital tract obstruction-vaginal septum, agenesis of cervix, agenesis of uterus and vagina, gonadal dysgenesis (Turner's syndrome XO-normal uterus, no visible ovaries or "streak" ovaries).

Conclusion

In conclusion, the efficiency of ultrasound depends on the competence, the proper training, the theoretical knowledge and the practical skills of the examiner. The ultrasound imaging information and the clinical examination lead to a complete assessment of the patient. Of course, is not a sole diagnostic method and there must be an adjunction to the physical examination to confirm the diagnosis. The ultrasound reduces the need for surgery and mayconduct to con-

servative, expectant or medical management. Ultrasound, at last, give us the possibility to discriminate which patients do require an operation and to select the optimal operation and surgeon.

Our opinion is that the modern Gynecological Ultrasound, as it has been already evolved the last years, offers great assistance and support in the investigation, diagnosis and treatment of many gynecological disorders and serves in all sub-disciplines of Obstetrics Gynecology (Gynecological Oncology, Urogynecology, Fetal Medicine, Reproductive Endocrinology, Child and Adolescent Gynecology) as they have been formed the last years.

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