

THE USE OF ULTRASOUND IN GYNECOLOGY

In August 2009 I wrote of the use of ultrasound in obstetrics and feel that it is now time to go over the use of this diagnostic tool in the practice of gynecology. Remember that ultrasound use in medicine is about fifty years old and much refinements have been made since it's inception as technology has improved. Using roughly the same physics as sonar on a submarine, high frequency (ultrasound) sound waves are generated and pulsed into the pelvis and as they bounce back an image is generated. Without getting too technical sound waves travel differently through different materials (think how loud a boat sounds if you are holding your head under water) and a computer then differentiates these sounds and makes an image. Years ago they were in shades of grey and now can be enhanced with color and even in three dimensions. Young doctors in residency training for obstetrics and gynecology are rigorously taught how to perform and analyze ultrasound images but in actual practice certified technicians perform the imaging and the doctor makes his conclusion. If an ultrasound is ordered by the gynecology provider a full bladder of the patient is generally required as sound waves passing through it will provide a clearer picture. The listening device (transducer that listens 99% of the time and sends out energy only 1% of the time) can be done abdominally or vaginally. The safety is assured as there is no scientific evidence that ultrasound can cause any damage to the patient, staff, or fetus, if pregnant. It is not an x-ray. In modern gynecology it is almost impossible to practice without this modality and most modern offices have their own machine. If not, it can be ordered through the hospital's x-ray department. There are times when a patient cannot be examined thoroughly as obesity prevents a pelvic exam from making conclusions about uterus size and ovaries. An ultrasound can be ordered that will enable the pelvic organs to be evaluated in spite of the obesity, recognizing that there are still limitations due to the size of the patient. Ultrasound is especially useful in evaluation an enlarged uterus. It can make the distinction between benign fibroids on the outside or the inside of the uterus and can detect intrauterine polyps. Measurements can be made of the uterine lining and if noted to be thickened in a menopausal woman can lead the practitioner to perform a biopsy or dilatation and curettage to rule out a malignant or premalignant condition. One of the most important uses of ultrasound is in the evaluation of ovaries. They are not the most easy to palpate on routine pelvic exam and while ovarian cancer is rare women are rightly petrified of the thought to have this disease and not know it. The normal size ovary in a premenopausal woman is roughly the size of a large almond and in menopausal woman the size of pea. Ultrasound can accurately measure ovarian size and shape and determine if an enlargement is cystic (fluid filled and usually benign) or solid with a higher risk of malignancy. Color enhancement of the blood flow to the ovary also aids in this diagnosis. In patients with chronic pain ultrasound can determine if the cause is gynecologic: cysts, tumors, endometriosis, adhesions, infection, etc. or from a non gynecologic cause such as bowel disease or a tumor arising from other organs in the pelvis. With the increased use of advanced reproductive technologies ultrasound is important in determining ovulation so that timing of in vitro fertilization can be

performed. Fallopian tubes can be seen and the diagnosis of ectopic pregnancy (pregnancy not occurring in the uterus) can be made early and many times surgery can be avoided. In the worst case scenario the surgery can be done before the tube ruptures and presents a life threatening situation. Lastly, with increased use of the intrauterine device (IUD) for contraception we sometimes see a patient in whom the string is not visible coming through the cervix. Did she expel the device and not know or has the iud moved in the uterus and rolled up the string like a fishing line? Ultrasound enables us to locate the iud and to plan on how to remove in either the office setting or in the operating room. A final word about ovarian malignancy: in the rare event that an ovarian malignancy is determined an ultrasound can help plan the course of therapy by measuring the size of the tumor, whether it has spread to the other ovary or surrounding tissues and if it is producing fluid (ascites). This will help the clinician plan a course of treatment with the patient that will include surgery, chemotherapy and a cancer treatment center. The above list is not all inclusive but should serve as a guide to a modern miracle that is relatively low cost (one seventh the cost of a ct scan); risk free; non invasive and accurate.