



News and topics

Ultrasound and the Complete Urologist Part 1: Methodology

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Computed tomography (CT) scanning is considered as the imaging study of choice for asymptomatic microhematuria according to the American Urological Association guidelines. For those patients with persistence of microhematuria after a negative initial examination, the guidelines suggest repeating the evaluation including CT scanning within 3 to 5 years. However, the cost and risk involved for utilizing this technology going forward is an issue, especially when the yield of finding significant pathology on subsequent imaging studies is exceedingly low. To minimize those concerns, I have proposed incorporating the utilization of ultrasound rather than the guideline-recommended CT for reasons and considerations to be discussed. In addition, I propose extending the use of ultrasound beyond evaluation of asymptomatic microhematuria to the routine urologic physical examination as it is superior to the current standard of palpation and percussion. The original concept of applying sound to a physical examination led to the technique of percussion. Technological advancement has taken the same sound, converted it to a digital image, and allowed us to see what we hear to achieve a greater diagnostic accuracy. The literature on this subject is reviewed and demonstrates support for just such a change in the delivery of urologic healthcare. I conclude by proposing that the quality of urologic care can be enhanced during a routine urologic physical examination through upgrading the technique of palpation and percussion by routinely utilizing ultrasound, creating the Complete Urologist. © 2017 Elsevier Inc. All rights reserved.

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As a clinical urologist in practice for over 30 years, I have witnessed a technological revolution involving everything from the advent of the percutaneous nephrostomy tube, ureteroscopy, extracorporeal shock wave lithotripsy, laparoscopic and robotic surgery, as well as the incorporation of electronic medical record, iPads, digital imaging technology, and e-mail communication in our professional activities. In this context, it is the technology of ultrasound associated with medicine for the past 75 years [1] that has taken a front row center seat in my office when it comes to the assessment, care and management of my patients.

It was my initial belief that this technology was being utilized by most practicing urologists. To my surprise, I discovered that this was apparently not the case. Many urologists were not utilizing ultrasound routinely, or were referring their patients to the radiologist for its performance instead of performing it themselves. However, I have found that ultrasound allows the physician to evaluate the patient in much greater detail than what is otherwise possible by the standard urologic physical examination.

As most of the urologic structures are hidden from view, only a cursory, external analysis of the patient occurs presently during a typical routine urologic physical assessment.

Ultrasound provides the physician with an opportunity to augment the examination by performing a comprehensive, internal evaluation. The combination of the physician listening to the patient's history, performing a tactile external examination and utilizing ultrasound to provide a visual inspection of the internal urologic anatomy, creates what can be considered to be the *Complete Urologist*. A physician utilizing sensory enhancing technology adds a new dimension to the clinical evaluation, helping to further guide the patient's care with a greater degree of accuracy than could otherwise be obtained if it were omitted.

As medicine has often been described as an art as well as a science, the ultrasound probe can metaphorically be considered the urologist's paint brush and the screen their canvas. What better way to bring to life the combination of the urologic history and physical examination using ultrasound at the same point of service where total care is thus provided by the expert in the field? It is rapid, painless, free of ionizing radiation, noninvasive, not necessarily requiring contrast agents, is inexpensive, and can be highly accurate. Ultrasound is a near-perfect way to provide instantaneous and vital information, which can explain why it has been referred to as the stethoscope of the 21st century.

Ultrasound effectively represents an enormous addition to the armamentarium of the urologist. It provides the patient and the physician with more immediate insight as to what is or is not occurring at a particular point in time than what palpation or percussion could ever accomplish. A negative or positive ultrasound examination thus augments the limitations of a traditional urological physical examination. In addition, it remains as a fixed digital image which can serve as a reference point for comparison during future examinations.

The importance of ultrasound in medicine has now become recognized by numerous medical schools throughout the country by its inclusion in the curriculum at the onset of the medical student's formal education [2–5]. For these future physicians ultrasound will be part of their routine physical examination. Utilization of ultrasound is not a new concept. Indeed, it has already been incorporated in the physical examination as such in other parts of the world (Germany, the Netherlands, and Italy) [6–9].

Failure of the urologist to embrace ultrasound as part of their routine evaluation represents what I consider a major omission as well as a disservice to our patients. Ultrasound can be considered on a par with other diagnostic studies that we routinely perform (such as cystoscopy and urodynamics). Who better to perform and understand the results of a urologic ultrasound examination in the context of a given clinical situation than the urologist who is examining the patient and directing their patient's care?

I believe that ultrasound should be kept within the urologist's domain. Those who refer their patients to the radiologist for ultrasound and then have the patient return for follow-up evaluation to review its findings are potentially delaying a diagnosis (especially for poorly compliant patients), increasing the costs to the patient and in turn to the entire health care system, prolonging and increasing the level of a patient's anxiety, causing the patient to lose time from work, and converting a single into multiple visits.

In addition, the radiologist may not be as familiar with the patient's entire history and may not view things in the same light as the urologist. This is especially true if it is a technician who is actually performing the ultrasound, the radiologist only looking at static images rather than dynamic ones. As a result, the radiologist often has to call the physician for clarification of certain issues.

Just as we are trained as urologists to perform our own radiologic imaging studies (e.g., IVP's, Retrograde Pyelograms, Cystograms, and VCUG's) we can similarly be trained to perform and interpret ultrasounds. Indeed, the American Urological Association (AUA) Office of Education apparently believes in the value of office ultrasound as it offers ultrasound courses for urologists several times throughout the year. It would therefore seem natural that they might also consider encouraging ultrasound training during residency.

The negative effects of referring a patient elsewhere for an ultrasound study can be decreased if the study is performed on the same day as the consultation when the

patient is receiving their point of service care. On the other hand, if the physician waits for signs and symptoms to develop before performing the ultrasound, an opportunity to discover silent pathology early on will potentially be missed. A prominent pathologist has observed that "there are at least 2 pathological diagnoses for every 10 years of age" [10]. Thus, pathologic processes increase inexorably in number as we age. Accepting this understanding gives us an opportunity to discover pathology early, but only if we consider it and make the associated effort.

Despite all of the recent and ongoing negative changes that have taken place in our healthcare system, we still first and foremost have a direct responsibility for the health and well-being of each of our patients. As physicians we have taken a medical oath through which a commonality of declarations have been made [11–17]. Specifically, during the course of caring for our patients we have a moral responsibility to perform to the best of our ability and without causing any harm. The added value of incorporating ultrasound into a routine urologic physical examination maximizes our diagnostic capability without producing risk, thus fulfilling our medical pledge.

I would describe 3 patients who recently presented to my office as useful examples of what I propose. The first 2 were men in their 50s who were asymptomatic and had requested an initial prostate evaluation. Their history, physical examination, and urinalysis were unremarkable. Yet, both patients were found on "routine" ultrasound to have organ confined renal cell cancer (2 and 6 cm lesions, respectively). If ultrasound had not been part of their routine evaluation, there would have been a significant delay in diagnosis. By the time the disease process had been discovered their cancer could potentially have been in a more advanced and possibly incurable stage.

The third case was a 60-year-old man who had recently been seen in consultation by a urologist for benign prostatic hyperplasia, obstructive uropathy and "feeling sick". Having received an alpha blocker following a physical examination, and experiencing no improvement, he presented to my office for a second opinion. Upon examination and ultrasound, he was discovered to have significant urinary retention and severe bilateral hydronephrosis. These findings, coupled with progressive constitutional signs and symptoms suggestive of uremia resulted in his immediate admission. His life-threatening acute renal failure resulting from obstructive uropathy, resolved with catheter drainage. It raises the adage that "if you don't think about it or don't look for it you will never find it." Traditional belief would suggest that the patient's distended bladder should have been palpable or percussible during the physical examination. However, this is not always the case. Certainly the bilateral hydronephrosis would not have been discernible. The point is that the diagnosis was *not* made during the patient's consultation with the initial urologist by standard palpation and percussion. The result of omission of ultrasound could have cost the patient his life.

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