Learning Objective

- Demonstrate utility of bedside ultrasound use by hospitalists in expediting treatment of deep vein thrombosis (DVT) via a case report
- Review current literature on diagnosis of DVT and the effectiveness of Pocket-Sized Ultrasound (PSU) in DVT evaluation

Case Study

A 71-year-old male was transferred from an outside hospital to the Internal Medicine service for bilateral hydropneumothorax and acute renal failure. A non-contrast CT of the abdomen and pelvis was suggestive of retroperitoneal fibrosis. The patient initially had bilateral nephrostomy tubes place by Interventional Radiology, later replaced with ureteral stents. The obstructive nephropathy resolved over several days. Additional workup and treatment for the new diagnosis of retroperitoneal fibrosis was arranged, and the patient was scheduled for discharge. Just prior to leaving the hospital, the patient noted new unilateral right lower extremity swelling.

Hospital Course

The treating physician performed a limited compression ultrasound of the patient’s common femoral and popliteal veins using a PSU. The femoral vein and popliteal vein were not compressible and echogenic material was seen inside the lumen. Discharge was aborted and anticoagulation therapy was initiated. The diagnosis of lower extremity DVT was later confirmed with a formal duplex ultrasound. Patient was discharged on anticoagulation and appropriate follow-up. The rapid diagnosis of DVT allowed treatment initiation and coordination of outpatient management a day prior to the formal study and shortened overall hospitalization.

Discussion

» Deciding if a hospitalized patient has a DVT is a frequent clinical question for hospitalists. DVT affects 1 in 1000 people per year and can lead to pulmonary embolism and death. Accurate and timely diagnosis and treatment are essential to reducing DVT related morbidity and mortality.

» Objective testing is crucial as clinical assessment alone is unreliable for diagnosis. Compression ultrasound is currently the “gold-standard” for objective diagnosis as it has sensitivity of 97%. Studies have verified the ability of clinicians to perform the ultrasound scan for DVT which allows faster treatment initiation. Although the number of trained clinicians is small, an increase in training is occurring across specialties and is now a part of several medical school curriculums, including the University of South Carolina School of Medicine. The growing body of literature on point-of-care ultrasound primarily comes from the emergency and surgical settings, but interest is growing among hospitalists. With technological advances, the bedside ultrasound is poised to become as commonly used as the stethoscope. Nakanishi et al. was the first group to demonstrate diagnosis of DVT with a PSU using a linear array transducer by doing an immediate comparative examination with standard ultrasound. In a comparison between PSU examination and standard sized ultrasound found that there was a 100% sensitivity and 100% specificity for DTVs when the PSU in the iliac, femoral and/or popliteal veins.

References


Conclusions

In Emergency Department patients, clinician performed bedside ultrasound for DVT has been shown to reduce time to diagnosis and limit empiric treatments or hospitalization. The use of PSU by clinicians in hospitalized patients may also improve care and reduce healthcare costs.

A Quality Improvement Project to assess this technology in this population is warranted.

Bedside Diagnosis of Deep Vein Thrombosis Using Pocket-Sized Ultrasound

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