



Original Contribution

Analysis of lawsuits filed against emergency physicians for point-of-care emergency ultrasound examination performance and interpretation over a 20-year period[☆]

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Abstract

Objective: The study aims to define extent of lawsuits filed against emergency physicians (EPs) over point-of-care emergency ultrasound (US) during the last 20 years.

Methods: We performed a nationwide search of the WESTLAW legal database for filed lawsuits involving EPs and US. WESTLAW covers all state and federal lawsuits dating back to 1939. Using an electronic search feature, all states were searched using emergency and US as key words. The database automatically accounts for different variants on US such as sonography. An attorney who is also boarded in and practices emergency medicine, as well as an emergency US expert, reviewed returned cases. Descriptive statistics were used to evaluate the data.

Results: Using the search criteria and excluding obvious radiology suits, 659 cases were returned and reviewed. There were no cases of EPs being sued for performance or interpretation of point-of-care US. There was one case alleging EP failure to perform point-of-care US and diagnose an ectopic before it ruptured. This case was won by the defense. There were no cases against EPs for common causes of radiology and obstetric litigation including sexual assault during endovaginal US. Cases of missed testicular torsion on US were frequent in the emergency setting but none linked EP US.

Conclusions: Only one case filed against EPs over the last 2 decades was identified, it was over failure to perform US. Most frequent litigations against radiologists and obstetricians are unlikely to be duplicated in the emergency department, and future litigations may also come from EP failure to perform point-of-care US.

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1. Introduction

Recent years have seen a tremendous increase in ultrasound (US) use by emergency physicians (EPs) [1–6]. What was more of an academic interest 2 decades ago has now reached

common topic status. Over the last 15 years, the American College of Emergency Physicians (ACEP) has created multiple documents on US guidelines, performance standards, and billing [1–4]. Concomitantly, developments outside emergency medicine, including the AHRQ report from 2001, which mandated US guidance for central line placement, are pushing emergency US to many community emergency medicine practices [7]. Residency training now mandates US education, and US is regularly tested on residency in-service examinations as well as both written and oral boards. Table 1 lists the

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Table 1 Core emergency US applications and extended applications from ACEP 2009 guidelines

Core applications	Extended applications
Trauma	Advanced echo
Intrauterine pregnancy	Transesophageal echo
AAA	Bowel US
Cardiac	Adnexal pathology
Biliary	Testicular US
Urinary tract	Transcranial Doppler
DVT	Contrast studies
Soft-tissue/musculoskeletal	
Thoracic	
Ocular	
Procedural guidance	

AAA, abdominal aortic aneurysm; DVT, deep vein thrombosis.

US applications described in the 2008 ACEP US guidelines [3]. The 2 categories distinguish between core applications and those that are more advanced and less frequently performed. However, many EPs already in community practice did not receive US training in residency and are left to catch up [5].

Unlike adopting new practice mandates such as goal-directed resuscitation for sepsis or the change to rapid sequence intubation many years ago, becoming proficient in US is more time and work intensive. In addition, there is a specter of liability for possible missed diagnoses or incorrect treatment. Several groups have encouraged this fear by speaking out against EPs' use of US in clinical practice [8]. Even recently, editorials have been directed at large audiences speaking out against point-of-care US and raising more fears about liability [9]. Various e-mail list discussions and blogs for emergency US groups periodically discuss alleged litigation generated by EP US misses but never seem to actually amount to identifiable cases.

Although considerable angst has been generated about liability encountered by EPs when using US and anecdotal urban tales exist about critical misses leading to poor outcome, no objective data have been published on the topic. It is logical to expect multiple lawsuits against EPs for US use just as for other types of cases. In addition, if concerns are valid, there should be a large body of litigation making it clear that EPs are at risk when using US in their practice. Lastly, it would be helpful to establish the pattern of lawsuits to date to increase practice safety. We sought to define the extent of lawsuits filed against EPs over point-of-care emergency US performance and interpretation during the last 20 years by searching a nationwide legal database.

2. Methods

2.1. Study design

This was an observational retrospective cohort study design, approved by the institutional review board with

waiver of written informed consent because no patient data would be collected from the legal database.

2.2. Study protocol

We performed a nationwide search of the WESTLAW legal database for filed law suits involving EPs and US. WESTLAW covers all state and federal lawsuits dating back to 1939. We chose to focus on the previous 20 years because there are no documented cases of routine point-of-care US use by EPs before that time in the medical literature. The database is restricted, and lawyers wishing to use the database must pay a fee. WESTLAW is one of the most widely used online legal search services in the country. It is available for lawyers and legal professionals in the United States. WESTLAW database service links to more than 40,000 databases of law journals, newspapers, law reviews, case law, state and federal statutes, administrative codes, magazine articles, public records, treatises, and legal forms. Legal documents on WESTLAW are indexed to the services proprietary master classification system. The searcher features support natural language and Boolean search requests.

Funding was obtained from an internal department grant and used to pay for database access and computer search time. Using an electronic search feature, all states were searched using emergency and US as key words. The database automatically accounts for different variants on US such as sonography. The returned cases were expected to include many lawsuits not actually involving EPs, and individual sorting would be required.

2.3. Analysis

An emergency US expert and an attorney who is also boarded in and practices emergency medicine both reviewed returned cases. Instances where radiologists were being sued along with EPs involving US and an EP did not perform the US examination were excluded. Disagreements were adjudicated by a third EP with experience in medical litigation and US. Data were collected using a standardized data sheet. Extracted data were entered into an Access (Microsoft, Redmond, WA) database for additional searching and review. Final data were exported to an Excel (Microsoft) spreadsheet for analysis. Descriptive statistics were used to evaluate the data.

3. Results

All federal and state cases were searched focusing on the last 20 years. Using the search criteria and excluding obvious radiology suits, 659 cases were returned and individually reviewed. Each of these cases were individually reviewed. Table 2 lists the categories of US types returned among the initial 659 cases shown by our search. Cases in which the EP

Table 2 Categories of the 659 identified search cases in descending frequency

US application category	No. of cases for category
Testicular	178
First trimester (rule out ectopic)	156
Abdominal aortic aneurysm	120
Pelvic pain (ovarian torsion)	113
Gallbladder (right upper quadrant pain)	92

and radiologists were being sued, but the EP did not perform the US, as in all of the testicular US cases we found, were excluded. There were no cases of EPs being sued for performance or interpretation of point-of-care US. There was one case of litigation alleging the EP failed to perform a point-of-care US and diagnose an ectopic pregnancy before it ruptured several days later. This case was won by the defense. There were no cases against EPs for common causes of radiology and obstetric litigation including sexual assault during endovaginal US.

4. Discussion

The question of liability is an important one and can affect not only how clinicians may use point-of-care US but also how quickly its use spreads through emergency medicine [10]. As most academic facilities are now considered saturated with point-of-care US, the remaining growth will occur in the community practice setting [3]. This is also the setting most sensitive to the perception of liability and risk because there is no sense of protection from a university or a teaching setting.

The concern private practice EPs feel about adopting point-of-care US is sometimes palpable. Articles on the topic for emergency department administrators have appeared over the years and have typically contained expert opinions and hearsay cases of missed diagnosis [11]. The truth behind this perception is critical and should be made public because it may have significant real-life impact. If the liability is high and suits against EPs are frequent, then EPs should reexamine practice patterns to see how liability may be decreased and patient safety increased.

Our data showed, somewhat surprisingly, that no cases have been filed against EPs for misinterpretation of US results or improper performance of US-guided procedures at the time of our search. Based on EP lore and electronic list discussion, we anticipated finding at least 20 lawsuits clearly filed against EPs for improper performance or interpretation of point-of-care US examinations. In fact, there is a suggestion that some liability may currently come from failure to perform US examinations that are considered the standard of care.

Obstetrical US is known for high liability because any mistakes may be connected with negative outcome in pregnancy or delivery and tend to yield high-dollar awards by juries in many areas of the United States [12]. Although EPs do perform pelvic US examinations and, thus, should have a share in this high-liability burden, they do not perform second and third trimester US on a routine basis. The most common examinations are first trimester US to rule out ectopic pregnancy. One binary question is whether there is a live intrauterine pregnancy. This is a focused question in which error and, therefore, liability may be limited. The next most frequent examination type is for nonpregnant pelvic pain, to evaluate for ovarian cysts. Both examinations not only ask focused questions but also often involve patients who may receive additional imaging later or be rapidly followed up by referral.

Radiologists performing US cover a wide range of US studies from abdominal to vascular. There is no doubt this exposes interpreters to a wider variety of possible errors or at least perceived errors. For instance, the testicular US examination to rule out torsion may lead to organ loss and litigation if torsion is missed and cases are common. Few EPs perform testicular US examinations at this time [3]. In fact, many point-of-care US examinations involve procedure guidance. Other point-of-care US examinations are coupled with physical examination and additional testing and do not occur in an information vacuum outside the clinical setting that is sometime encountered by traditional imaging providers.

The future will hold litigation against EPs using US as well as their failure to use US when standard of care dictated its use at the point of care. We feel that the former is inevitable because clinicians perform ever more US examinations and develop newer US skills, making periodic mistakes. Even without mistakes, lawsuits can still be filed and even be successful. Litigation for failure to use point of care will come more frequently as plaintiff attorneys and the public become better educated about the changes in standard of care in emergency US use, and this is clearly already occurring [13-18]. A particularly pressing issue is the standard use of US for central line placement. This is a widely endorsed standard of care and was recently supported as a quality measure by the National Quality Forum and was backed by Centers for Medicare and Medicaid Services (CMS).

It is important to stress that although US use by EPs does not appear to generate significant number of law suits and point-of-care US applications may decrease error and liability in many cases, US is no magic bullet against error and liability. A helpful example is the use of US for guidance in central line placement. Multiple studies have shown a significant decrease in line placement complications when US is used, and some have come to feel that US and vascular access yield complete safety and absence of procedure complications. Although data to the contrary have not been widely celebrated, there is emerging literature suggesting errors still occur and may even be complicated by a

perception on the part of the clinician that US makes central line placement essentially error free [19-21].

This study has several limitations. Not all cases filed against EPs may have been caught by the search, although all state and federal cases were automatically searched. In some cases, EP-performed US examinations may have been involved in a lawsuit indirectly, and although having a bearing on the case, US was not used as a descriptor in the case filing. This study did not cover claims settled before a lawsuit was filed. This might have been picked up if insurance databases were open for evaluation in addition to the one used for this study. However, to date, there is no evidence of a significant litigation pattern against EPs for point-of-care US performance, and there is some suggestion that liability exists from failure to perform US examination when indicated.

References

- [1] Mateer J, Plummer D, Heller M, Olson D, Jehle D, Overton D, et al. Model curriculum for physician training in emergency ultrasonography. *Ann Emerg Med* 1994;23:95-102.
- [2] Emergency ultrasound imaging criteria compendium. *Ann Emerg Med* 2006;48:487-510.
- [3] Policy statement: emergency ultrasound guidelines. *Ann Emerg Med* 2009;53:550-70.
- [4] Cardenas E. Emergency medicine ultrasound policies and reimbursement guidelines. *Emerg Med Clin North Am* 2004;22:829-38.
- [5] Moore CL, Molina AA, Lin H. Ultrasonography in community emergency departments in the United States: access to ultrasonography performed by consultants and status of emergency physician-performed ultrasonography. *Ann Emerg Med* 2006;47:147-53.
- [6] Moore CL, Gregg S, Lambert M. Performance, training, quality assurance, and reimbursement of emergency physician-performed ultrasonography at academic medical centers. *J Ultrasound Med* 2004; 23:459-66.
- [7] Agency for Healthcare Research and Quality. Making health care safer: a critical analysis of patient safety practices [Summary]. *Evid Rep Technol Assess*. 2001; (43):i-x, 1-668.
- [8] Abbott J. Emergency department ultrasound: is it really time for real time? *J Emerg Med* 1990;8:491-2.
- [9] Welch SJ, Hellstern RA, Seay T, et al. We're failing our residents: training ED docs for the real world. *Emerg Med News* 2010;5:5-24.
- [10] Kruse J, Phillips D, Wesley RM. Factors influencing changes in obstetric care provided by family physicians: a national study. *J Fam Pract* 1989;28:597-602.
- [11] What are liability risks of ultrasound in the ED? *ED Legal Letter*, Sep 2010
- [12] Chervenak FA, Chervenak JL. Medical legal issues in obstetric ultrasound. *Clin Perinatol* 2007;34:299-308.
- [13] Hind D, Calvert N, McWilliams R, Davidson A, Paisley S, Beverly C, et al. Ultrasonic locating devices for central venous cannulation: meta-analysis. *BMJ* 2003;327:361.
- [14] Duncan DR, Morgenthaler TI, Ryu JH, Daniels CE. Reducing iatrogenic risk in thoracentesis: establishing best practice via experiential training in a zero-risk environment. *Chest* 2009;135:1315-20.
- [15] Beaulieu Y, Marik PE. Bedside ultrasonography in the ICU: part 1. *Chest* 2005;128(2):881-95.
- [16] Tayal VS, Hasan N, Norton HJ, Tomaszewski CA. The effect of soft-tissue ultrasound on the management of cellulitis in the emergency department. *Acad Emerg Med* 2006;13:384-8.
- [17] Adhikari S, Blaivas M. Utility of bedside sonography to distinguish soft tissue abnormalities from joint effusions in the emergency department. *J Ultrasound Med* 2010;29:519-26.
- [18] Brown TW, McCarthy ML, Kelen GD, Levy F. An epidemiologic study of closed emergency department malpractice claims in a national database of physician malpractice insurers. *Acad Emerg Med* 2010;17: 553-60.
- [19] Stone MB, Hern HG. Inadvertent carotid artery cannulation during ultrasound guided central venous catheterization. *Ann Emerg Med* 2007;49:720.
- [20] Blaivas M. Video analysis of accidental arterial cannulation with dynamic ultrasound guidance for central venous access. *J Ultrasound Med* 2009;28:1239-44.
- [21] Blaivas M, Adhikari S. An unseen danger: frequency of posterior vessel wall penetration by needles during attempts to place internal jugular vein central catheters using ultrasound guidance. *Crit Care Med* 2009;37:2345-9.