Case File

Point-of-care ultrasound should end the outdated practice of "marking for a tap"

by Anna Platovsky, MD[1] and Benjamin T. Galen, MD[2]

(1) Einstein Medical Center Philadelphia, Department of Gastroenterology
(2) Albert Einstein College of Medicine and Montefiore Medical Center, Dept of Internal Medicine, Division of Hospital Medicine

A 55 year old man with a history of alcoholic cirrhosis decompensated by esophageal varices status post banding presented to the emergency room with abdominal pain. He also noted increased abdominal girth with associated poor oral intake and early satiety as well as a 10 lb. weight gain over 2 weeks. On examination, the patient was afebrile with stable vital signs and no respiratory distress. His abdominal examination revealed tense ascites with mild tenderness to palpation of the left upper quadrant. There was no jaundice or asterixis. Laboratory testing was significant for mild thrombocytopenia but no leukocytosis or abnormal liver tests. Liver synthetic function was preserved.

Abdominal computed tomography (CT) scan revealed a cirrhotic liver with evidence of portal hypertension including splenomegaly, large ascites and peri-esophageal and peri-splenic varices. The overnight admitting medical team planned to perform a diagnostic and therapeutic paracentesis and referred the patient to radiology to be "marked for a tap." The next morning, the patient was transported by stretcher to a radiology suite where an ultrasound technologist acquired multiple ultrasound images of the ascites and marked the skin on the patient's right lower quadrant. The radiologist formally interpreting the images commented on ascites but declined to confirm a "pocket to tap" as he was not provided images of fluid in two orthogonal planes. The day team used point-of-care ultrasound and readily identified a large volume of simple intra-peritoneal fluid (Figure 1). They selected a new site for paracentesis, mindfully avoiding the inferior epigastric arteries and underlying small bowel. The skin entry region marked by the technologist was no longer ideal given repositioning after the patient's return to the hospital floor. At the bedside, 4.2L of ascites was safely removed by paracentesis [1]. The patient experienced immediate relief of abdominal discomfort and was discharged that same day on diuretics after the ascites cell count result was not concerning for spontaneous bacterial peritonitis.

Paracentesis is a frequently performed inpatient and outpatient procedure. It is recommended for patients with new-onset or tense ascites and patients with ascites and any infectious signs or symptoms [2]. Furthermore, paracentesis is recommended for any patient with ascites admitted to the hospital because it is associated with increased short-term survival [2,3]. Overall complication rates are as low as 1% with more severe complications such as bowel entry by the needle and hemoperitoneum occurring in less than 0.1% of patients [2].

Point-of-care ultrasonography (POCUS) has emerged as a useful adjunct to the physical examination to diagnose ascites [2]. Ultrasound guidance is also recommended for paracentesis to select the ideal site to avoid bowel, solid organs, and blood vessels [1,2,4]. The practice of transporting inpatients off the hospital floor for a formal ultrasound solely for skin marking is therefore unwarranted in routine cases, given the growing availability of training

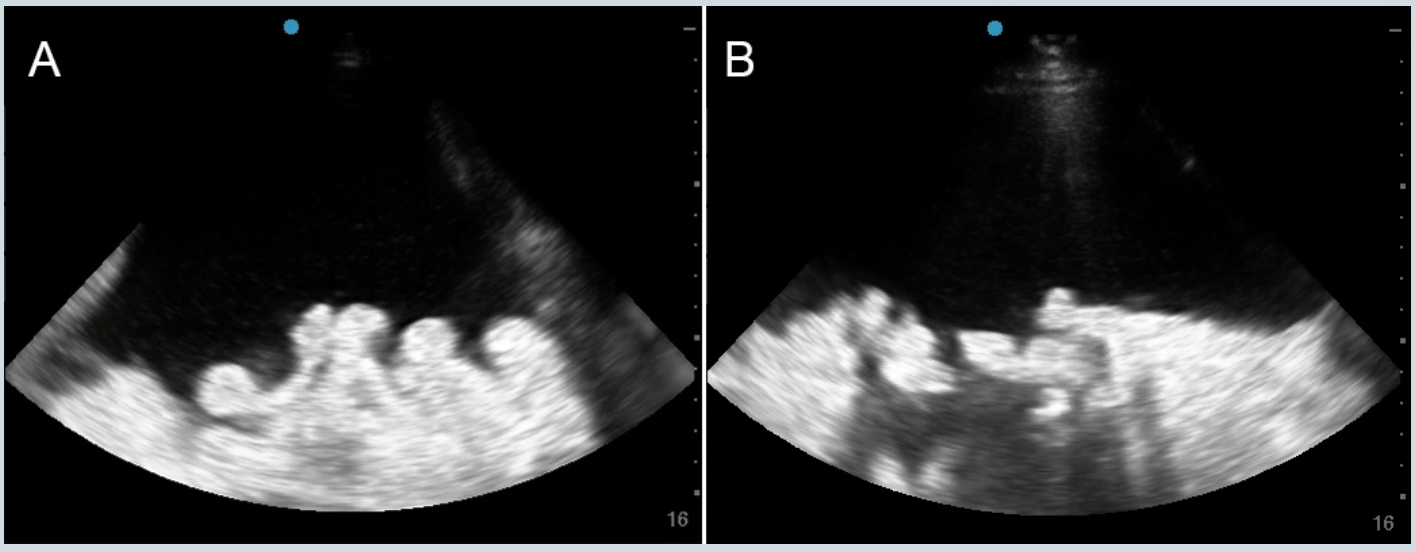

Figure 1. Representative examples of ascites prior to paracentesis as seen on point-of-care abdominal ultrasound.

and access to POCUS in emergency medicine, internal medicine, and critical care.

For the patient, this “mark for tap” practice adds unnecessary cost, inconvenience, and delay. In cases of spontaneous bacterial peritonitis (SBP), delayed diagnosis could postpone appropriate treatment, which can lead to severe sepsis and death [2]. For the institution, utilizing limited resources such as patient transportation, sonography, and radiology for unnecessary studies creates delays for other patients. For the clinician performing the paracentesis, a radiology-marked site could provide false confidence, because the operator should instead be aware of all anatomic structures at the time of the procedure. As in the above case, “blindly” using a previously marked site would not have been ideal; loops of bowel and soft tissue anatomy change with patient positioning and should not be assumed to be constant in relation to the fluid target for aspiration. Although rare, hemorrhagic complications to paracentesis might be avoided by identification of abdominal wall vasculature using POCUS [4].

Bedside paracentesis is a safe, routine, and potentially life saving procedure. While formal imaging studies are necessary to evaluate for liver morphology, tumor, and splanchnic thrombosis, transporting inpatients solely to be “marked for a tap” is an outdated practice and could lead to unnecessary cost or delays in care [2].

References

1. Thomsen TW, Shaffer RW, White B, Setnik GS. Videos in clinical medicine. Paracentesis. N Engl J Med. 2006 Nov 9;355(19):e21

2. American Association for the Study of Liver Diseases Practice Guideline: Management of adult patients with ascites due to cirrhosis 2012. http://www.aasld.org/sites/default/files/guideline_documents/adultascitesenhanced.pdf Accessed 12/30/2014

3. Orman ES, Hayashi PH, Bataller R, Barritt AS . Paracentesis is associated with reduced mortality in patients hospitalized with cirrhosis and ascites. Clin Gastroenterol Hepatol. 2014 Mar;12(3):496-503.e1.

4. Sekiguchi H, Suzuki J, Daniels CE.. Making paracentesis safer: a proposal for the use of bedside abdominal and vascular ultrasonography to prevent a fatal complication. Chest. 2013;143(4):1136-1139

Visit the online article to view additional content from this case: pocusjournal.com/article/2017-02-02p11-12