Ultrasound News

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Trans-hepatic Lung Ultrasound – A Window for Supine Patients

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Lung ultrasound has gained increasing use in the last few years, especially in the critically ill patients. By applying the probe on the thorax, much of the lung can be inspected and multiple conditions can be diagnosed and monitored, through anterior, lateral and posterior thoracic views [1].

However, the majority of ICU patients are supine, barring access to visualization of the lowest and most posterior portion of the lower lobe, as it extends through most of the posterior half of the lung and only little on the lateral surface [1,2]. Visualization of the lower lobe is important, as it occupies a significant portion of the right lung and it is usually affected in aspiration pneumonia [3].

We describe a novel approach to visualization of part of the lower lobe of the right lung, through a trans-hepatic approach. We first used this approach in a 72-year-old patient with dyspnea and severe hypoxemia, to diagnose a lower lobe pneumonia, which was ill-defined in the chest x-ray and later confirmed by looking at a computed tomography (CT) (Figure 1). This later exam had been
Figure 3. Schematics of probe position relative to the liver (L), average depth to visualize the diaphragm (D) and the right lower lobe (RLL); part of the RLL may not be seen depending on patient anatomy; the middle lobe and the right upper lobe are too deep to be visualized, except if atelectasis is present.
Figure 1. Chest x-ray of the patient (left) and CT scan of same patient (right), performed in the same day, showing right lower lobe consolidation, as well as, left lower lobe consolidation.

Figure 2. Positioning of the ultrasound probe in order to perform a trans-hepatic lung ultrasound (left panel); lung ultrasound findings in the same patient, showing the liver (L), diaphragm (D) and a consolidated lower lobe of the right lung (C), as shown by the shred sign (middle panel); lung ultrasound findings in another patient without pneumonia, with visible pleura (P) and lung sliding (right panel).
Hematocrit Sign Elucidates Cause of Abdominal Pain

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Abstract
A 78-year-old male with chronic kidney disease on peritoneal dialysis developed unprovoked bilateral pulmonary embolisms. He was started on IV unfractionated heparin, but shortly thereafter developed severe pain and a small firm abdominal nodule near his dialysis catheter site. The diagnosis was unknown, and the initial plan was watchful waiting, until point-of-care ultrasound (POCUS) was used. POCUS revealed an ovoid mass with hyperdensity in the gravity dependent regions with spontaneous movement. This appearance was classic for the hematocrit sign. When combined with the clinical presentation, this was concerning for a rectus sheath hematoma. An urgent CT of the abdomen confirmed this several hours later. POCUS allowed for rapid bedside diagnosis, which expedited appropriate care in a potentially life-threatening situation.
The hematocrit sign is an imaging finding frequently associated with superficial hematomas or hemothorax. The appearance of the hematoma varies depending on the duration of bleeding. Hematomas may appear heterogeneously hypoechoic initially and become increasingly hyperechoic over time. The hematocrit sign (Figure 1a) occurs as coagulated cells and debris collect in dependent areas due to gravity, forming a distinct line of separation between liquid and cellular components of blood.

Figure 1. a) Point of Care Ultrasound of Left Lower Abdominal Quadrant mass showing the hematocrit sign. b) CT abdomen and pelvis showing a 11x11x5cm rectus sheath hematoma.
Use of point-of-care ultrasound to diagnose spontaneous rupture of fibroid in pregnancy

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Abstract

Background: Complications of fibroids in pregnancy are well known, including postpartum hemorrhage, labor dystocia, and cesarean delivery. Outside of pregnancy and labor, the rare occurrence of spontaneous fibroid rupture has been documented. Case: The current case report involves a woman who presented with acute abdominal pain in the third trimester of pregnancy and was found to have spontaneous rupture of a fibroid before the onset of labor. Her initial presentation, diagnosis through use of point-of-care ultrasound, acute surgical management, and postoperative course are described. Conclusion: When assessing acute abdominal pain in a pregnant patient, fibroid rupture should be considered despite the absence of prior uterine surgery. Bedside point-of-care ultrasonography is a useful tool for assessment of abdominal pain in the third trimester of pregnancy.
Figure 2. Positive FAST exam of the right upper quadrant. Free fluid is highlighted inferior to the liver with red circle. More anatomy visible in Supplementary Video S1.

Figure 3. Positive FAST exam of the pelvis. Clotted blood is highlighted in red circle. More anatomy visible in Supplementary Video S2.
Figure 1. Representative image of a fibroid in the third trimester of pregnancy.

Figure 4. Left sided fibroid with capsular rupture.
Measurement of the Applicability of Abdominal Point-of-Care Ultrasound to the Practice of Medicine in Saudi Arabia and the Current Skill Gaps

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Figure 1. Residents’ perception of the applicability of APOCUS, self-reported proficiency, and the skill gap. This figure illustrates residents’ perceptions of the applicability of abdominal point-of-care ultrasound (APOCUS) to their clinical practice and their self-reported ability to perform APOCUS. Data are presented as mean ± standard deviation. The skill gap was calculated from the difference between the average applicability of all four indications for APOCUS and the mean self-reported proficiency in APOCUS.
Abstract

Background: Renal, gastrointestinal, and hepatic pathology, and the resources available for their management vary internationally. Whilst abdominal point-of-care ultrasound (APOCUS) should enhance management, uptake by physicians, worldwide, has been poor. So, the aim of this study was to explore the applicability of APOCUS to medical practice in Saudi Arabia, residents’ current ability to perform APOCUS, and the skill gaps. Methods: A validated questionnaire was distributed to the internal medicine residents at our institution to determine their ability to perform APOCUS (self-reported), and obtain their opinions on its applicability for the detection of hepatomegaly, splenomegaly, hydronephrosis, and ascites. Statistical analysis: Standard descriptive statistical techniques were used. Categorical data, presented as frequency, were compared using the $\chi^2$ test. The Likert scale responses, presented as mean ± standard deviation, were compared with a t test or analysis of variance. Results: Ninety-eight residents participated (response rate 90.7%). Abdominal POCUS is very applicable to their practice. The use of APOCUS to detect ascites was the most applicable (mean 4.61 ± SD 0.69). However, proficiency in APOCUS was poor (mean 1.65 ± SD 1.11). Conclusions: The difference between internists’ self-reported ability to perform APOCUS and its perceived usefulness demonstrates a skill gap. Thus, whilst APOCUS is applicable to medical practice in Saudi Arabia, significant skill gaps exist.
Point of Care Ultrasound First: An Opportunity to Improve Efficiency for Uncomplicated Pregnancy in the Emergency Department

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Abstract

Introduction: Research suggests emergency providers using point-of-care ultrasound (POCUS) to confirm an uncomplicated intrauterine pregnancy (IUP) can decrease emergency department (ED) length of stay (LOS) compared to a radiology department ultrasound (RADUS). The objective of this study was to compare the time to diagnosis and LOS between POCUS and RADUS patients. Methods: This was a retrospective study at one urban medical center. A standardized tool was used to abstract data from a random sample of pregnant patients diagnosed with uncomplicated IUP between January 2016 and December 2017 at a single tertiary care medical center. Microsoft Excel 2010 software was used to measure time intervals, prepare descriptive statistics, and perform Mann-Whitney U tests to compare differences. Results: A random sample of 836 (36%) of the 2,346 emergency department patients diagnosed with an IUP between 8-20 weeks’ gestation during the study period was evaluated for inclusion. Three hundred sixty-six met inclusion criteria and were included in the final analysis. Patients were divided into 2 groups based on which type of ultrasound scan they received first: POCUS (n=165) and RADUS (n=201). Patients who received POCUS were found to have an IUP identified in an average of 48 minutes (95% CI, 43 to 53), while the RADUS group’s mean time to diagnosis was 120 minutes (95% CI 113 to 127) with a difference of 72 minutes (95% CI, 63 to 80; p<0.001). The mean LOS for patients who received POCUS was 132 minutes (95% CI, 122 to 142), while that of the RADUS group was 177 minutes (95% CI 170 to 184) with a difference of 45 minutes (95% CI 32 to 56; p<0.001). The study is limited by its single-center, retrospective design and by lack of blinding of data abstractors. Conclusion: Pregnant emergency department patients diagnosed with an uncomplicated IUP between 8-weeks and 20-weeks’ gestation had statistically significant reduction in time to diagnosis and disposition from the ED if assessed with POCUS as compared to RADUS.
Table 1. Comparison of time intervals for POCUS and RADUS groups

<table>
<thead>
<tr>
<th>Time interval between ED arrival and first scan (minutes)</th>
<th>POCUS (n=165)</th>
<th>RADUS (n=201)</th>
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<tr>
<td>Mean</td>
<td>48 (CI 43-53)</td>
<td>120 (CI 113-127)</td>
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<tr>
<td>Range</td>
<td>0-150</td>
<td>20-225</td>
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<td>Difference</td>
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<td>72 (CI 63-80)</td>
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<td>p-value</td>
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<table>
<thead>
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<th>Time interval between ED arrival and departure (minutes)</th>
<th>POCUS (n=165)</th>
<th>RADUS (n=201)</th>
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<tbody>
<tr>
<td>Mean</td>
<td>132 (CI 122-142)</td>
<td>177 (CI 170-184)</td>
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<tr>
<td>Range</td>
<td>32-283</td>
<td>63-354</td>
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<tr>
<td>Difference</td>
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<td>45 (CI 32-56)</td>
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