

Diagnosis of Psoas Hematoma using Point of Care Ultrasound in Pediatric ICU: A Case Report

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Abstract

Point of care ultrasound is a very useful investigation in ICU for the diagnosis of various diseases as well as monitoring of the complications. As many intensivists have started using it; various new uses are being discovered in ICU setup and its spectrum of application is becoming wide. We report a case of "bilateral pneumonia with empyema and right femoral deep vein thrombosis", in which psoas muscle hematoma could be diagnosed during a routine bedside sonography during resident teaching. The Ultrasound technique, findings and review of literature have been discussed. Bedside sonography in this case, resulted in earlier detection of psoas hematoma and its drainage. This case emphasises that bedside sonography is a simple investigation in ICU which can help the intensivist in making earlier diagnosis and management and so should be used routinely in critical care set-up. To the best of our knowledge the sonography images are unique and have not been discussed before.

Keywords: Point of care ultrasound (POCUS); Psoas hematoma.

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Introduction

Use of Point of care ultrasound (POCUS) in intensive care of patients is increasing day by day. It can be used to identify the complications during ICU stay like Pneumothorax, deep vein thrombosis, pericardial effusion, cardiac tamponade, to name a few. It does not involve extensive training and even newer users can pick up abnormal findings. In our patient we identified psoas muscle hematoma during routine bedside sonography. The intensivist had not seen such findings earlier but was able to delineate the hematoma on POCUS and this was

later confirmed with radiologist on ultrasound and CT scan abdomen. In this case bedside sonography was decisive and helped in rapid management of the patient.

Case Report

A 12 year old boy was admitted with bilateral pneumonia and empyema in our pediatric ICU. During the hospital stay he developed deep vein thrombosis (DVT) of right femoral vein. He was started on subcutaneous heparin and then switched over to warfarin after three days. On 7th day, the

intensivist carried out the USG (ultrasound) examination to re-evaluate the thrombus and to teach the PICU residents. The thrombus had decreased in size. She decided to show the normal vessels on left side so that the residents could compare normal findings from the abnormal. She positioned the probe on the opposite normal side i.e below left inguinal ligament. The patient was asked to straighten his left leg but he complained of pain in the left hip and was not able to extend the hip. On clinical examination, he kept his left hip joint flexed although there was no visible mass or swelling. POCUS was done in flexed hip position which revealed an anechoic mass when the probe was positioned below left inguinal ligament as is done for DVT USG examination (Fig. 1A). A diagnosis of hematoma or abscess in the groin was considered. As inability to extend the hip and knee may occur due to psoas abscess, retrocecal appendicitis and diverticulitis; the intensivist also positioned the USG probe over abdomen to look for any collections or abnormal findings. A well-defined collection was appreciated by the intensivist but she could not make a diagnosis. The Radiologist review done within some hours confirmed the findings. He showed that it was actually a collection in psoas muscle extending below up to the upper part of the left lower limb. CT scan of abdomen showed a large collection in psoas muscle and confirmed the USG findings (Figs. 3 and 4). Chances of a pus collection were high for two reasons; 1) the patient had pus collection in pleura bilaterally and 2) there was no hemodynamic compromise. The surgical referral was done and a pigtail catheter was put to drain the collection after stopping anticoagulant therapy. It drained blood stained fluid. Thus a diagnosis of psoas hematoma was made finally. Repeat USG done.

USG Technique: POCUS was performed with ALOKA USG machine (Japan) with a high frequency (7.5 Hz), linear transducer. Image was taken by putting the probe just below the inguinal ligament with marker towards the lateral side. Because it was in close proximity and very much looked like urinary bladder, we put a probe on pubic symphysis to record its appearance (Fig. 2A). The bladder image was totally different and showed punctate opacities. We also differentiated it from acoustic shadow of femoral bone and we put the probe 4-5 cm below the inguinal ligament, it appeared as a semicircle hyper echoic half-moon margin with hypoechoic shadow below and no lower margin (Fig. 1B); while the cyst had a regular

hyperechoic circular margin. POCUS abdomen was done using a curvilinear 3.5 Hz probe put on left flank. It showed a large oblong anechoic collection.

USG findings: USG groin showed a well-defined anechoic mass measuring 3×4 cm with clear thick margin suggestive of cystic mass in close proximity of femoral artery (being lateral to it) (Fig. 1A). USG abdomen showed a large oblong shaped anechoic collection with thin margins on long axis view (Fig. 2B). On follow up USG groin showed a organized hematoma in place of cystic mass in close proximity of femoral artery (being lateral to it) (Fig. 1B).

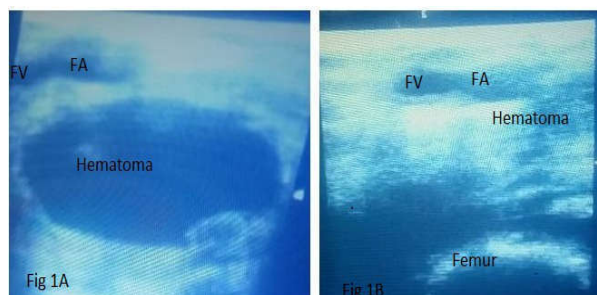


Fig. 1: Figure 1A showing psoas hematoma lateral to femoral vessels and figure 1B showing the hematoma after 15 days.



Fig. 2: Figure 2A showing urinary bladder with punctate opacities and figure 2B showing the hematoma in abdominal ultrasound.

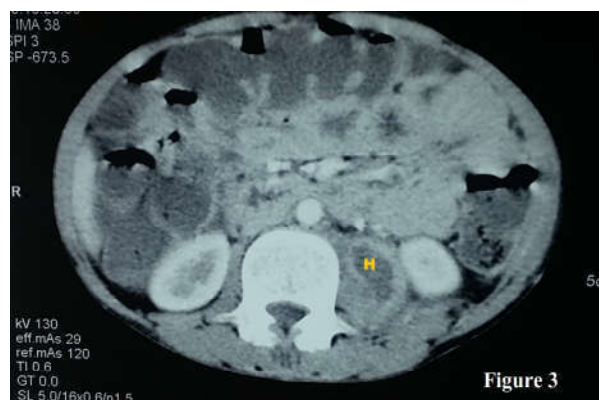


Fig. 3: CT scan abdomen (axial) showing presence of collection shown by yellow colour (H) in psoas muscle

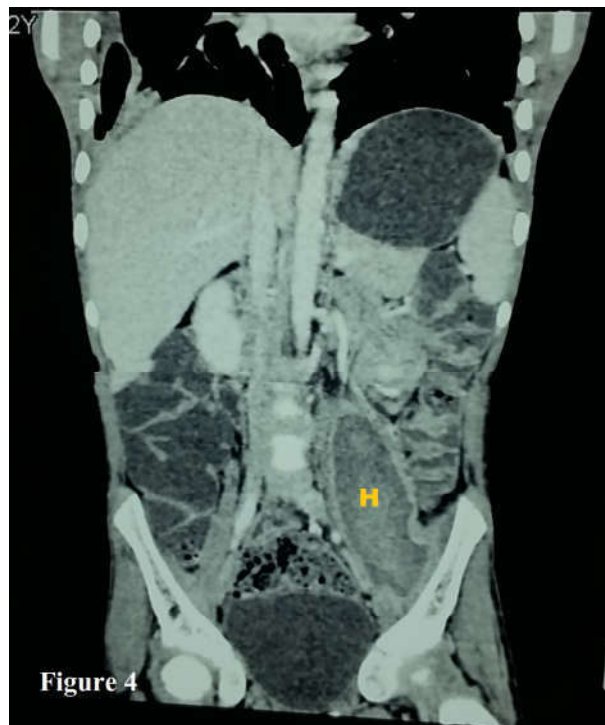


Figure 4: CT scan abdomen (Sagittal) showing presence of collection shown by yellow colour (H) in psoas muscle

Discussion

POCUS is now being increasingly used in pediatric emergency and critical care set up [1,2]. It facilitates the clinicians in confirming their clinical findings instantaneously bedside and thus faster management of the complications in PICU. Thus it results in decreased length of PICU stay [3]. It has got diverse applicability from head to toe in any critical patient. In our case the bedside ultrasonography was decisive and led to earlier fixing up of the complication i.e. “psoas hematoma”. The USG examination was being done routinely by the intensivist as a follow up DVT examination and resident teaching. In an attempt to show the normal vessels on the opposite side i.e. left femoral vein; this abnormality (large cystic mass) was picked up. The intensivist was able to single out the anechoic cystic mass (in close proximity with femoral artery) with confidence but could not make a diagnosis. On searching literature, we made a differential diagnosis of abscess, cyst, hematoma or pseudo-aneurysm. As this case had bilateral empyema, finding a psoas abscess was quite possible. Abscess are anechoic or hypo echoic and occasionally have debris and septations [4]. This patient was on anticoagulant therapy so hematoma was also very likely. A hematoma usually appears as an anechoic

mass on sonography in the acute phase; however, it has mixed echogenicity in the sub-acute and chronic phases [5]. Iatrogenic pseudo aneurysm was a possibility in PICU because of arterial cannulation procedures. It shows the anechoic cavity of the pseudo aneurysm, communication with the femoral artery, a swirling pattern of blood flow, and to-and-fro flow on spectral Doppler imaging [6]. In our PICU we do not use femoral artery for cannulation rather we do it on radial or posterior tibial artery. Moreover no communication could be appreciated between the femoral artery and the anechoic mass. So its possibility was lower in this case.

As the patient kept his hip and knee flexed which may occur due to psoas abscess, retrocecal appendicitis and diverticulitis; the abdomen was also explored by USG which showed a well-defined collection in the long axis. The intensivist could appreciate the finding but could not make a diagnosis [7,8].

The case was reviewed by the radiologist same day (within hours), who traced groin collection up into the abdomen and made a diagnosis of psoas collection extending up to the groin. A pigtail drain was put from which blood was drained and thus a diagnosis of psoas hematoma was made. The child had a favorable outcome and was discharged in good general health. USG exam was certainly crucial resulting in speedy diagnosis and management. The key advantage is that the abnormal findings can be picked up by even the new users without any confusion.

Conclusion

Point-of-care ultrasound is a very useful investigation for quick diagnosis of even unexpected abnormalities. Further, even new users can appreciate never seen before abnormal findings.

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