

Should intensivist do routine abdominal ultrasound?

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Abstract

Roundworm infestation is common in tropical climate population with a low socioeconomic status. We describe a case of a young male with polytrauma accident who presented with small bowel dysfunction with a high gastric residual volume during enteral feeding. While searching the etiology, the intensivist performed bedside abdominal ultrasound (USG) as a part of whole body USG screening along with clinical examination using different frequency probes to examine bowel movement and ultimately found ascariasis to be the cause. This case report will boost up the wide use of bedside USG by critical care physicians in their patient workup.

Keywords: Ascariasis, bedside, bowel movement, gastric residual volume, ultrasonography

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Introduction

Roundworm (ascariasis) infestation is common in the population with low socioeconomic status especially in developing countries. Patients with ascariasis may be present with different gastrointestinal symptoms but is difficult to diagnose in sedated or obtunded condition in an Intensive Care Unit (ICU) setup. We report a case where a patient presented with a high gastric residual volume due to intestinal ascariasis. It was incidentally diagnosed by the intensivist while doing abdominal sonography to detect bowel movements (peristalsis) as a part of screening ultrasound (USG) along with the clinical examination. We have taken consent from the patient for reporting the case.

Case Report

A 35-year-old man got admitted to our trauma ICU with the diagnosis of head injury (frontal contusion), faciomaxillary injury with mesenteric artery tear. Initial focussed assessment sonography for trauma was positive. He was shifted to the operating room for exploratory laparotomy. Mesenteric tear repaired and

there was no bowel injury. In view of the low Glasgow Coma Scale, metabolic acidosis, and hypothermia he was not extubated. After consulting the general surgeon enteral nutrition was started from the 4th postoperative day onwards. On the 5th day, his orogastric (Ryle's) tube aspiration appeared high. Clinically his abdomen appeared visibly tense, distended but abled to pass stool. Subacute intestinal obstruction, perforation or paralytic ileus were suspected, and bedside X-ray abdomen supine and erect posture was advised but findings were inconclusive. Injection metoclopramide 10 mg 8 hourly and tablet erythromycin 250 mg 6 hourly were prescribed one by one but no benefit observed. Fentanyl infusion was cut off from sedation analgesia chart to reduce the opioid related bowel dysfunction. Hypokalemia and hypomagnesemia corrections were attempted. Even after all possible corrections his gastric residual volume was still high (950 ml/24 h). Total parenteral nutrition was planned. The intensivist was doing bedside USG examine his body system along

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with clinical examination. He concentrated to see the small bowel movements during abdominal USG. With curvilinear probe (3.5 MHz) he was able to locate the bowel lumen. For better visualization water had been injected through the orogastric tube. There were definite peristaltic movements visible on screen (Micromaxx sonosite, Gurgaon, India). Inside the bowel lumen, he noticed some linear structures [Figure 1]. After changing to linear probe (7.5 MHz), it appeared clearer [Figure 2]. Sonography finding was suggestive of some worms. We prescribed albendazole 400 mg single dose immediately. The next day moderate sized roundworms were noticed in his stool [Figure 3]. Patient's abdominal distention reduced. He started accepting enteral nutrition and subsequently weaned off from the ventilator.

Discussion

The roundworm is generally common in the small bowel (jejunum) and can cause bowel obstruction or irritation, appendicitis, and even bowel perforation. It may also be present in the biliary tract.^[1] USG of the abdomen is a quick, safe, noninvasive, and inexpensive radiological examination with a small learning curve. Nowadays USG is inevitable in critical care unit for bedside assessment of hemodynamic status and for helping in invasive procedures and many more. In USG, the worm appears as a thick echogenic strip with a central anechoic tube. It can look like multiple long, linear, and parallel echogenic strips without acoustic shadowing.^[2] Malde and Chadha described small bowel worms as a single central echogenic line or as two parallel hyperechoic bands with a hypoechoic center.^[3] The live worm on longitudinal section appears as a tubular shadow having brighter margins described by some as "strip sign." There is a hypoechoic core producing the "inner tube sign." The coiled worm appears as "spaghetti." The multiple roundworms can appear as "stacked tubes sign." The cross-sectional image gives the appearance of "Target Sign." USG examination of the patients in the left lateral decubitus position after ingestion of water improved detection and visualization of the worms.^[4] All previous reported intestinal ascariasis were either outdoor or inward admitted patients. They were stable, able to give history, and USG was conducted by a radiologist in the radiological suit. In our case, detection was incidental during the examination of bowel movement for high gastric residual volume in sedated patient. A routine USG scan using the common 3–3.5 MHz probe yields no definite findings to diagnose intestinal ascariasis. If a high frequency probe of 5–10 MHz is used instead, intestinal ascariasis could be definitely established as the bowel loops are just under the abdominal wall.^[5] The



Figure 1: Ultrasound (curve probe) showing *Ascaris* worm in the bowel loop as a parallel echogenic structure

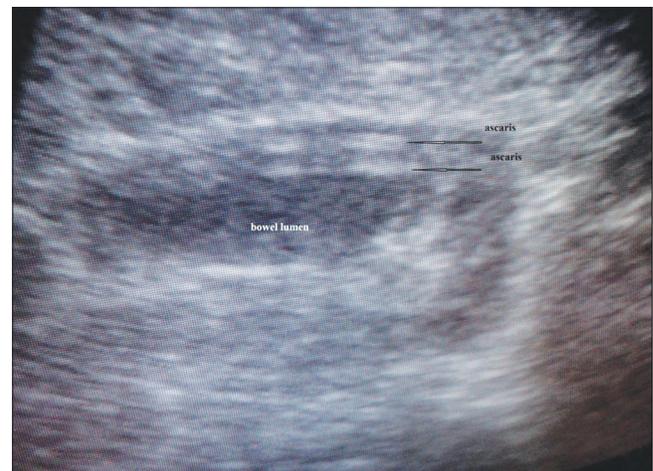


Figure 2: Ultrasound (linear probe) showing *Ascaris* worm in the bowel loop as a parallel echogenic structure



Figure 3: *Ascaris lumbricoides* (round worm) expelled out after albendazole tablet

detection of intestinal ascariasis is difficult by routine abdominal probes, hence commonly missed in routine

abdominal sonography. Detection of biliary ascariasis is easier than intestinal one as hepatobiliary areas are generally more an area of interest for the sonologist than the bowel in abdominal sonography, as well as bowel loops detection sometimes become very difficult due to air in between the bowel and probes. A new USG technique for the intestinal examination, named "sono-enterocolonography" by oral water administration, was devised to overcome the problem.^[6] Applications of USG are now expanding day by day in critical care setting. We use USG in bedside as a screening along with the clinical examination like optic nerve sheath diameter for suspected raised intracranial pressure; airway, and chest examinations; echocardiography; abdomen for solid structures, bowels, biliary tree, free fluids and collections, bladder, pelvis; extremities for fractures diagnosis and vascular system. This case is an example of showing the effect of thorough USG examination. To conclude bedside sonography can play a significant role in detecting the cause or nature of abdominal pathology in critically ill

patients. Hence, bedside USG in critically ill patients can be a useful tool in an intensivist's armamentarium.

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Conflicts of interest

There are no conflicts of interest.

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