



**Society of Radiologists in Ultrasound
2012 Toshiba Residents Program**

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Clinical History

5 month old male with vomiting and abdominal distention

Diagnosis

Meckel diverticulum intussusception causing small bowel obstruction.

Discussion

Meckel diverticulum is a rare entity occurring in approximately 2% of the population at large [1]. Most Meckel diverticulae will remain asymptomatic. Intussusception as a complication is rare, occurring in less than 7% of Meckel cases [2]. Intussusception is best diagnosed with ultrasound in the pediatric population, and there are some immediately apparent findings that can help determine the appropriate management of the patient. Patients with intussusception length greater than 3.5 cm, and/or interloop fluid between the intussusceptum and intussuscepiens with maximal dimension exceeding 9 mm are less likely to have successful non-surgical reduction [3, 4]. Ultrasound can be used effectively in both the diagnosis, and management of the intussusception patient, as described below.

In our case, an abdominal radiograph was obtained for our patient (Figure 1) which revealed signs of small bowel obstruction (SBO). For a pediatric patient with SBO, differential diagnosis includes: appendicitis, adhesions, intussusception, incarcerated hernia, malrotation, and Meckle diverticulum.

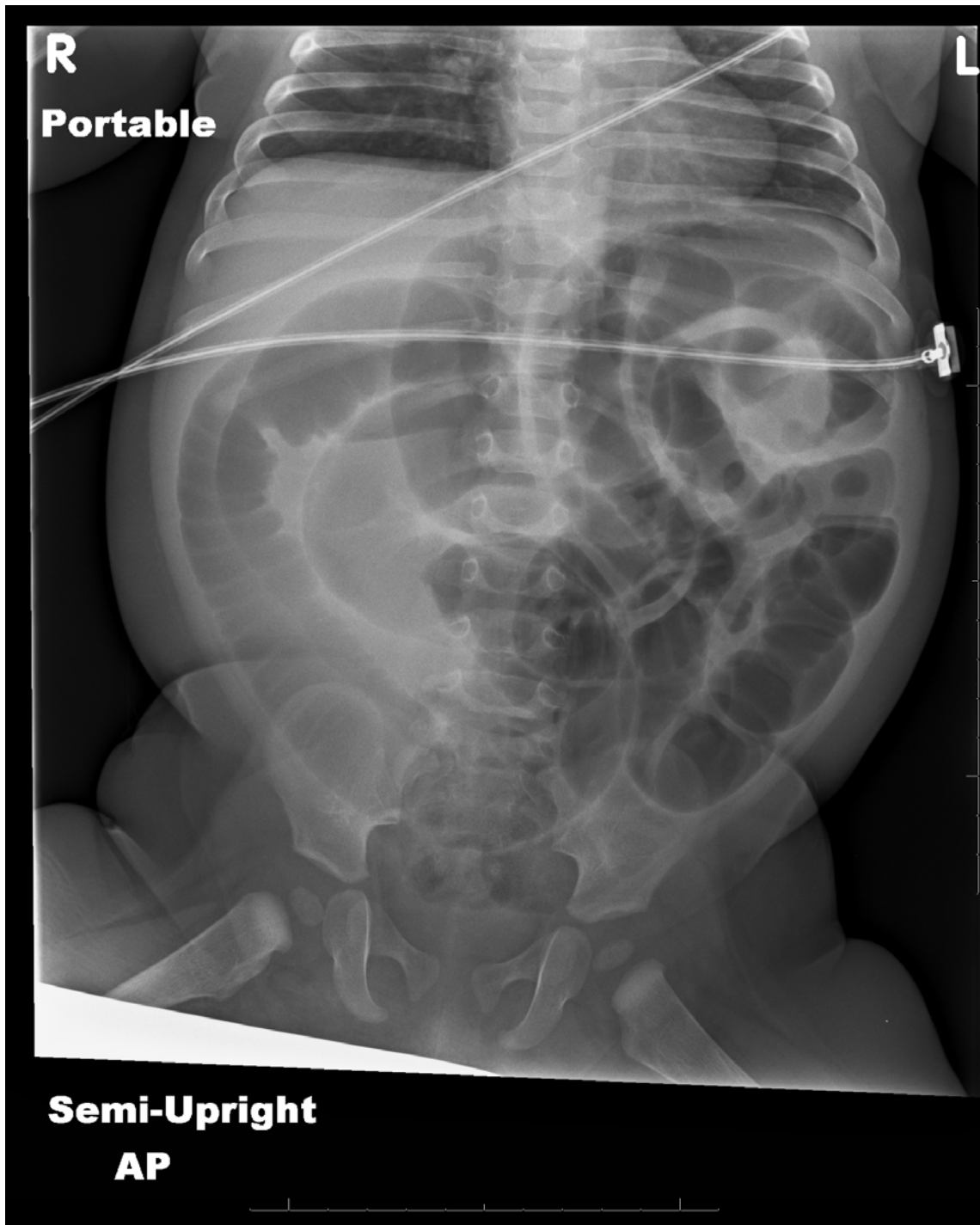


Figure 1: Abdominal radiograph showing signs of small bowel obstruction: multiple dilated loops of small bowel.

As Surgery was immediately consulted, an ultrasound (US) examination of the abdomen was performed. US quickly showed intussusception with a full circle of fat in cross-section, and a large amount of intraluminal fluid (Figure 2). A full circle of fat is strongly indicative of a Meckel diverticulum because there is mesenteric fat on both sides of the diverticulum, whereas in a normal loop of small bowel, there is mesenteric fat on

only one side, giving a more crescentic appearance to the fat in an intussusception. Ascites was another finding (Figure 3). These findings implied the need for surgical reduction was likely as discussed above.

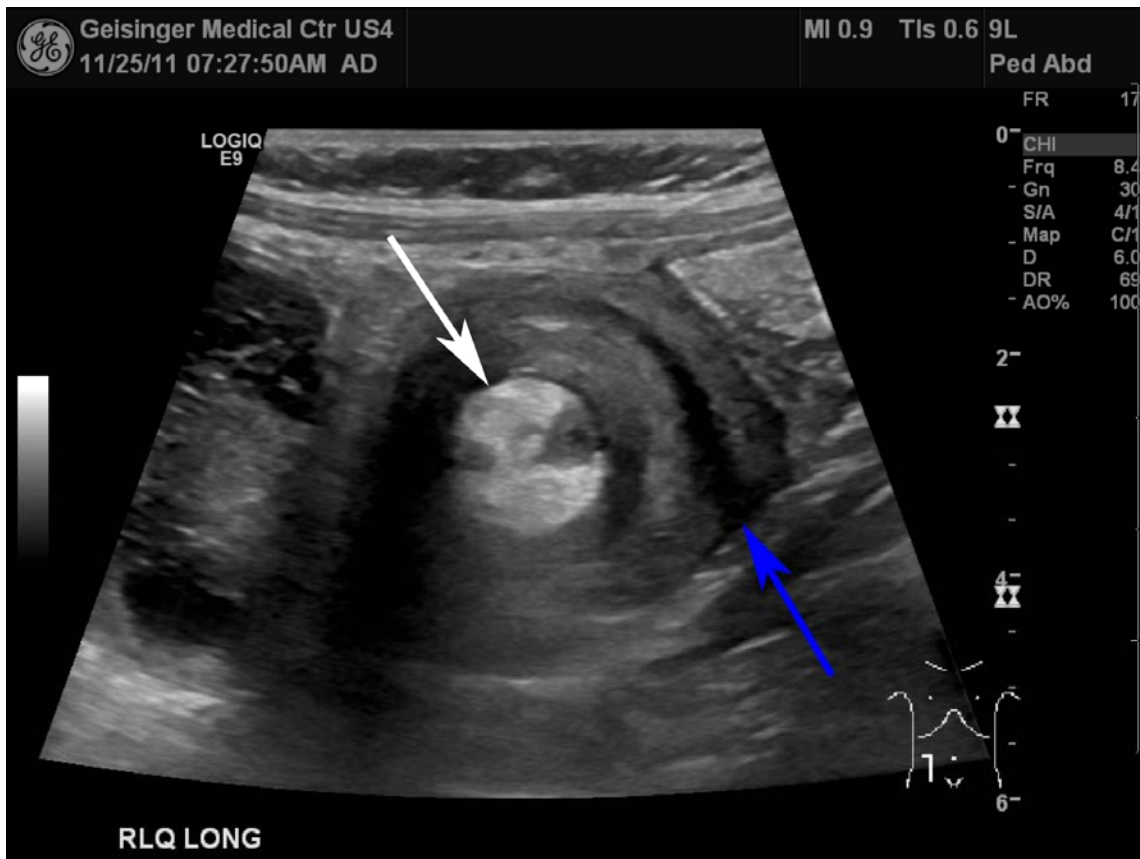


Figure 2: Ultrasound showing “target sign” (white arrow). Instead of the more common small crescent of fat seen in the intussusceptum, we have a near complete circle of fat which is strongly indicative of a Meckel diverticulum. Intraluminal fluid can be seen as well (blue arrow).

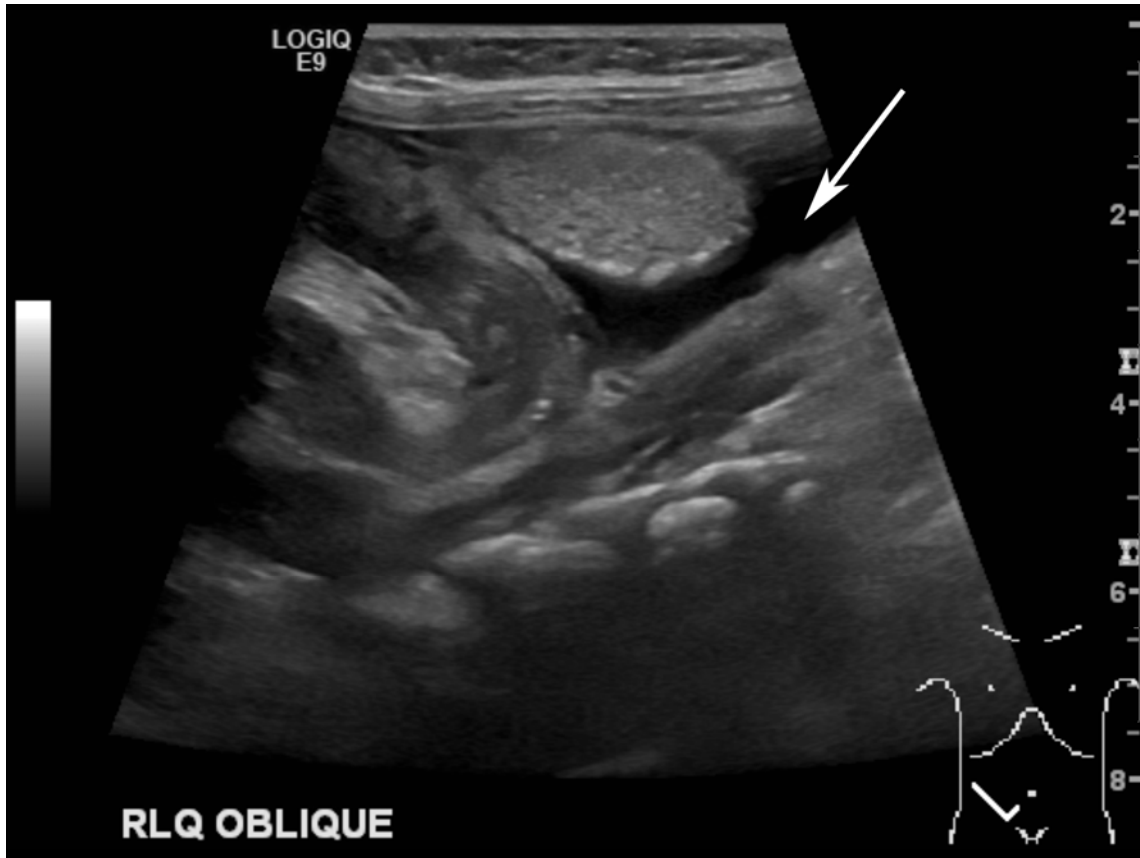


Figure 3: Ultrasound cine clip still image showing ascites (arrow).

The patient was taken to the fluoroscopy suite where reduction would be attempted with surgical consult standing by in accordance with standard practice. Given the large amount of air proximal to the obstruction seen in the abdominal radiograph, it was decided that gastrograffin reduction would be attempted to more effectively monitor reduction progress with ultrasound imaging, thus drastically reducing the radiation dose to the patient [5](Figure 4). Reduction was unsuccessful.



Figure 4: Fluoroscopic image during gastrograffin enema. The ultrasound probe can be seen to the left of the image for the monitoring of reduction progress. Note the intraluminal filling defect that turned out to be the Meckel diverticulum. Also note the coiled feeding tube in the esophagus (about which, Surgery was notified).

The patient was taken to the OR where the intussusception was reduced, and a Meckel diverticulum was found as the lead point (Figure 5).



Figure 5: Intraoperative photograph showing the Meckel diverticulum. Photo courtesy of the surgeon, Alfred Kennedy, Jr., MD

In conclusion, US is extremely useful in both diagnosis, and in management (monitoring reduction progress) of intussusception. US findings such as intraluminal fluid measuring greater than 9 mm, intussusception length greater than 3.5 cm, ascites, and a nearly complete circle of fat in the intussusceptum can be used to indicate likelihood of the necessitation of surgical management, thus expediting appropriate treatment.

References

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