

Sonographic Features of Pneumatosis of the Small Bowel

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Pneumatosis intestinalis has been associated with gangrene of the bowel, collagen vascular disease, chronic bronchitis and asthma, ulcer disease and diverticulitis.¹ Gangrene of the small bowel is a rare cause of acute abdomen, which is more often caused by arterial thrombosis or a volvulus. The radiological features of this condition are well described. The sonographic features of one case of gangrene of the small bowel with intramural air is presented here.

CASE REPORT

A 50-year-old man presented with acute abdominal pain and persistent vomiting of two days duration. His abdomen was not distended, and the clinical examination was normal. Plain X-ray of the abdomen in erect and supine positions, taken at the time of admission, were normal. He was put on nasogastric tube aspiration and intravenous fluids. The pain increased in intensity and was constant. On the second day of admission, the patient became toxic. At this stage sonography was requested.

Sonography was done on a real-time sector/linear scanner with 3 MHz transducers. The liver, gall bladder, pancreas, spleen and kidneys were normal. There was a long stretch of bright echos just beneath the anterior abdominal wall, separated from it by a thin echo-poor line (Figure 1). There was posterior shaggy shadowing suggestive of air in the bowel. On tracing this in the cephalic direction, it entered an echo-poor mass. This is suggestive of air in the center of a thick wall of a bowel loop and not of luminal gas (Figure 2). On turning the patient to the right decubitus position, the entire echogenic line moved to the upper flank (Figure 3). There was no bubbling as would be expected in a dilated bowel loop containing air and fluid within the lumen (Figure 4). This confirmed that the air was within the wall of the

bowel. Sonographic features were in favor of grossly edematous walls of a loop of bowel with air within the walls.

A plain X-ray of the abdomen was repeated, which showed air in the walls of a jejunal loop (Figure 5). At laparotomy the first loop of jejunum was found to be gangrenous. It was resected and an end to end anastomosis was carried out. The postoperative course was uneventful.

DISCUSSION

A case of gangrene of the small bowel with intramural gas is presented. Distinction between intramural gas and intraluminal gas was effected in the following manner.

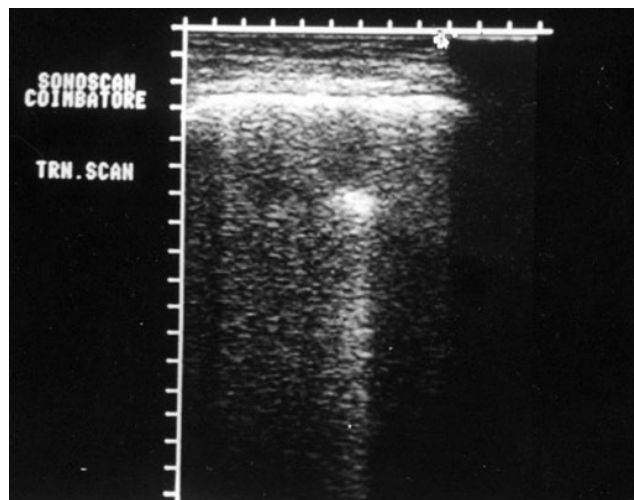


FIGURE 1. Transverse scan to the left of the umbilicus showing a long strip of bright echos separated from the anterior abdominal wall by a thin echo-poor line.



FIGURE 2. Oblique scan cephalic to Figure 1 tracing the bright echo line into the echo-poor mass representing the edematous bowel wall.

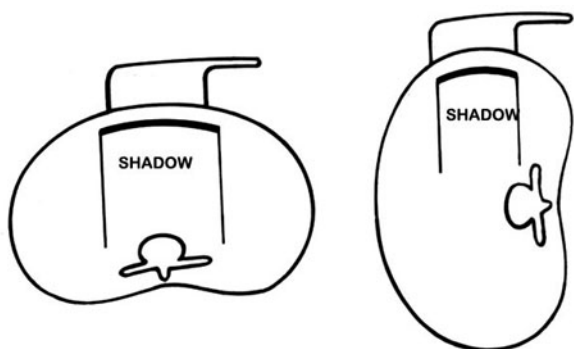


FIGURE 3. Schematic diagram showing sonographic appearance of intramural gas in supine and lateral decubitus positions.

Sonography showed features of air within the edematous walls of a loop of bowel. Toward the cephalic end it was seen as an echo-poor mass with a central bright line. This bright line, representing air, was continuous with a long bright line just beneath the anterior abdominal wall. This long strip of air could very well represent air in a dilated loop of bowel. In such a case, when the patient is turned to the decubitus position, there would be bubbling because of

mixing of air and fluid in the lumen of the dilated loop. This would settle after some time, and there would be an air-fluid level as shown in Figure 4. On the contrary, in this patient, this was not seen, but instead the long strip of air moved into the nondependent flank confirming that it was intramural air. The case is presented to describe the sonographic features of air in the walls of the small bowel and to describe findings which can differentiate intramural and luminal air.



FIGURE 5. Plain x-ray confirming intramural gas in jejunal loop.

There are two earlier reports,^{1,2} of sonographic recognition of intramural air in the bowel, one of which is intraoperative. In the other report of a case of pneumatosis intestinals, the sonographic appearance was bright echoes with shadowing due to air seen within the thick walls of the colon.

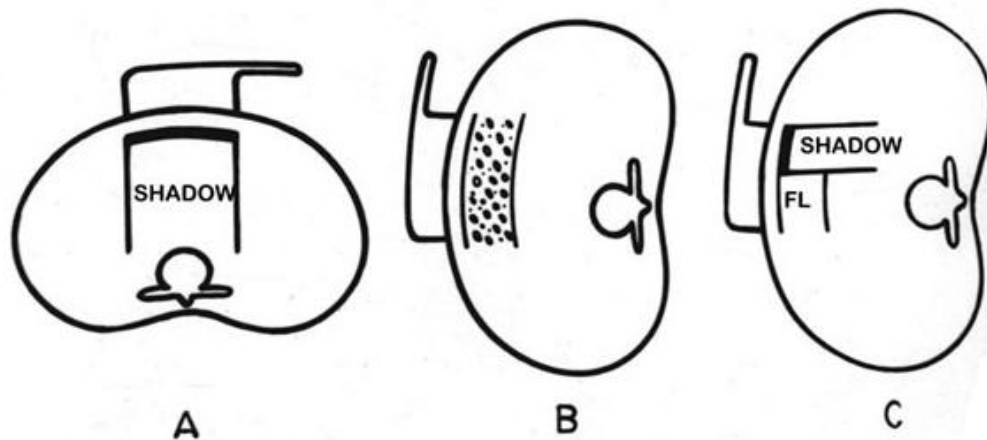


FIGURE 4. Schematic diagram to show the sonographic appearance of intraluminal gas within a dilated loop of bowel in (A) supine (B) immediate lateral decubitus and (C) delayed lateral decubitus positions.

REFERENCES

1. Vernacchia FS, Jeffrey RB, Laing FC, Wing VW: Sonographic recognition of pneumatosis intestinalis, *Am J Roent* 145:51-52,1985.
2. Bernard, Junji M, Jose RR, et al: Ultrasonic features of pneumatosis intestinalis. *J Clin Ultrasound* 13:675-678,1985.