

Septic Phlebitis and Gas in the Inferior Mesenteric Vein: CT findings in Two Cases and Review of Literature

J McClenathan

Citation

J McClenathan. *Septic Phlebitis and Gas in the Inferior Mesenteric Vein: CT findings in Two Cases and Review of Literature*. The Internet Journal of Surgery. 2007 Volume 16 Number 2.

Abstract

In evaluating patients with abdominal pain, physicians and surgeons have increasingly relied upon CT scanning of the abdomen and pelvis. Diagnostic accuracy in treating a wide variety of abdominal and pelvic conditions is facilitated by CT scanning. In this article we will review our experience treating two patients discovered to have septic phlebitis of the inferior mesenteric vein when they were scanned. Their clinical histories and salient CT findings are presented.

CASE HISTORIES

A 67-year-old man was treated at another hospital for colostomy dysfunction and a peristomal hernia. In 2002, he was treated for a rectal cancer with radiotherapy, proctocolectomy and ileoanal anastomosis with protecting ileostomy. In 2003, he had ileostomy closure. In 2004, he had a loop sigmoid colostomy for recurrent disease with distal obstruction. In January 2006 he had colostomy relocation and repair of peristomal hernia. Shortly after discharge, he was admitted to our hospital with abdominal pain. On exam, he was afebrile and did not appear to be toxic. His abdomen was not tender. Lab values showed a leukocytosis with WBC elevated to $23,000/\text{mm}^3$. Other lab abnormalities included total bilirubin of 2.9 mg/dl. Alkaline phosphatase was 276. A CT scan was done which showed pneumophlebitis and air traced all the way into the inferior mesenteric vein. (Figures 1A, 1B, 1C) Since air in the portal venous system is most commonly seen in patients with ischemic bowel, the patient was explored. The surgeon felt that operative findings were basically normal considering the patients recent operation and nothing further was done. The patient improved with antibiotic therapy.

Figure 1

Figure 1A: Air in the liver was thought to be in branches of the portal vein



Figure 2

Figure 1B: Air in portal vein more centrally

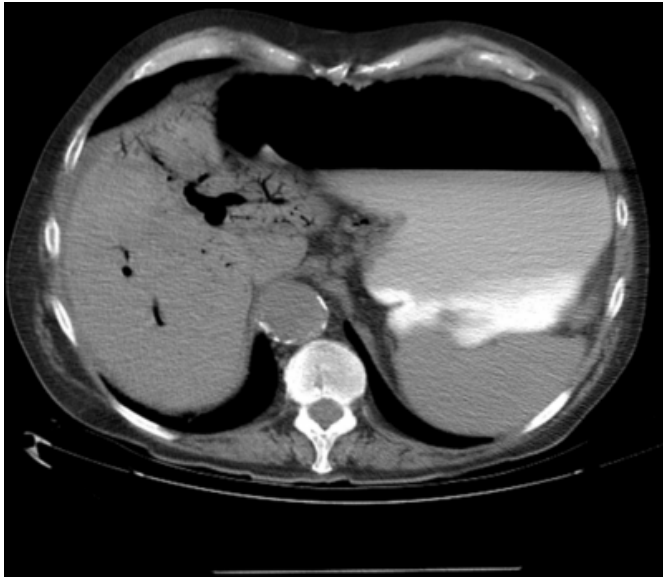


Figure 3

Figure 1C: Air seen in Inferior Mesenteric Vein



A 56-year-old man was seen for a ten-day history of chills and fever. He did not have abdominal pain. His temperature was 39.8 degrees C. His abdominal exam was normal and stool Hemocult was negative. His WBC was 15,700/mm³. Blood cultures were drawn which grew gram-negative rods. Serum bilirubin was 4.8 mg/dl. Other liver function tests were normal. Abdominal and pelvic CT scan showed air in the liver, in the portal vein and in the inferior mesenteric vein. (Figure 2A and 2B) In addition, portions of the inferior mesenteric vein were filled with clot or debris (Figure 2C).

Diverticula were seen but there was no radiographic evidence of diverticulitis or abscess. The next day, portal venous ultrasound showed either clot or debris in both the right and left portal veins.

The patient was explored and a sigmoid colectomy and end colostomy with Hartmann procedure was done. When the inferior mesenteric vein was cut across, it appeared to contain fecal material. After his operation, the patient was anticoagulated because of concern that there was clot in the portal venous system. He also responded to antibiotics and was discharged from the hospital in ten days.

Figure 4

Figure 2A: Small gas shadow in liver

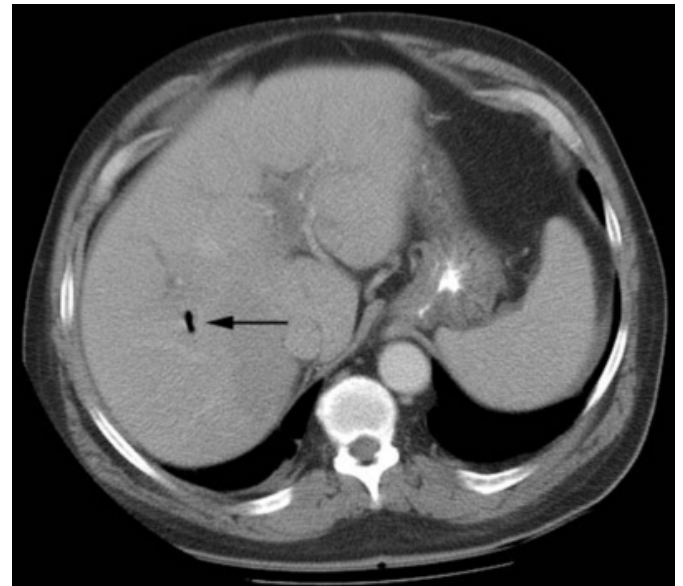


Figure 5

Figure 2B: Gas in inferior mesenteric vein

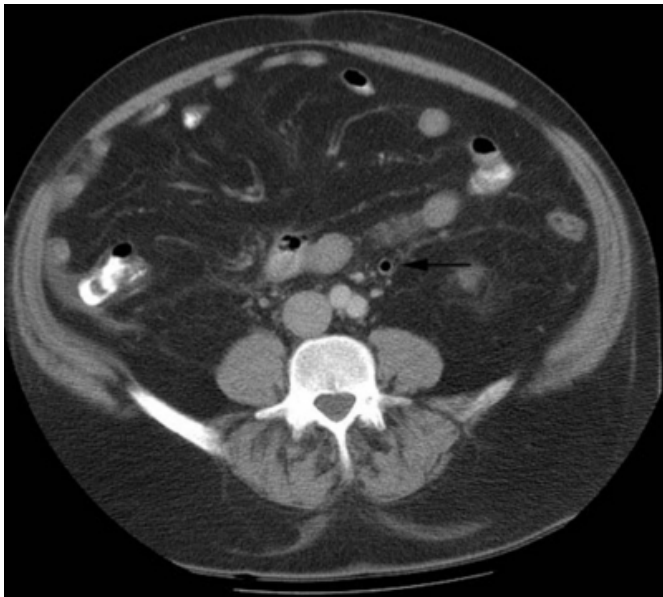
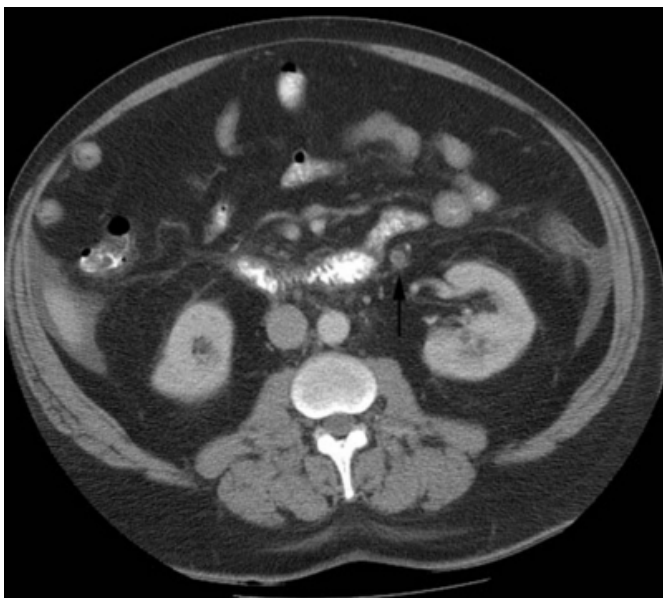


Figure 6

Figure 2C: Debris filling inferior mesenteric vein



DISCUSSION

The presence of gas within the inferior mesenteric vein is usually found in patients with diverticular disease of the colon and indicates either a direct fistula with intestinal gas entering the vein through the fistula, the presence of gas producing organisms within the vein, or both of these conditions simultaneously. Jensen (1) described two patients with pneumopylephlebitis and described inflammatory findings associated with the inferior mesenteric vein in two

patients who were felt to have intramesocolic diverticular perforation. They suggested that a water-soluble contrast study could help identify and localize the site of communication between colon and portal venous system. They also emphasized that physical findings of active diverticulitis do not need to be present in these patients. Our first patient emphasizes this point further by showing that even intra-operative findings of septic phlebitis may be subtle unless a careful examination of the colon or the tissues surrounding the inferior mesenteric vein is done.

Table 1 summarizes cases of inferior mesenteric vein septic phlebitis that we have identified during the past 35 years. Thirteen patients are reviewed in addition to our two patients. Eleven of fourteen patients were men with ages ranging from 35 to 72. Abdominal pain was reported in only ten of the fourteen patients; in those ten patients, more than half reported only vague or mild pain. Nausea, vomiting and change of bowel habits were not reported. Blood in the stool was described in only one patient.

In the thirteen patients where abdominal exam is described, four had no tenderness, five had mild tenderness and only four had significant tenderness. Eleven patients were febrile. Leukocytosis was described in five of eight patients. Mild to moderate elevation of serum total bilirubin was present in half of the patients.

An abdominal CT scan was done in nine of the fifteen patients. Most patients had evidence of inflammatory process tracking along the course of the inferior mesenteric vein with streaking or stranding of the adjacent soft tissues. Six of the eight patients had gas within the inferior mesenteric vein and the eighth had barium from a recent barium enema within the IMV. Seven of nine patients also had radiographic findings of diverticulosis or diverticulitis with inflammation next to the sigmoid colon and mesentery. Thrombus or debris was seen in the inferior mesenteric vein in five patients. (8,9,11,12) In one patient, the only reported CT abnormality was gas seen near the head of the pancreas. (1),

Six of the fifteen patients did not have a CT scan. Abdominal films showed portal venous or hepatic gas in three patients. (1,2,6) One of those patients also had gas in the inferior mesenteric vein. (2) Three patients had contrast enemas, two with barium and one with gastrograffin. (3,4,5) All three studies had contrast material in the inferior mesenteric vein.

Septic Phlebitis and Gas in the Inferior Mesenteric Vein: CT findings in Two Cases and Review of Literature

In addition to antibiotic therapy, fourteen of the fifteen patients had surgical treatment. In most of the patients, some degree of thickening of the sigmoid colon and its mesentery was found. The inflammatory process usually tracked along the course of the inferior mesenteric vein. Eight of the patients had thrombus within the inferior mesenteric vein either seen on CT scan or grossly seen in the operating room. Ten patients had sigmoid resection with end colostomy and Hartmann pouch creation. One patient also had drainage of a mesocolic abscess.

Two patients had a “negative” exploratory laparotomy and no resection done. One of these two patients recovered with antibiotics alone. (McClenathan) The other required a second operation with sigmoid resection and colostomy three weeks later to control sepsis. (2) One patient had a loop colostomy of the transverse colon which failed to control sepsis, so a second operation to resect sigmoid colon and convert to an end colostomy was done. (3) One operation was not described. The final patient was treated with antibiotics alone and eventually recovered without an operation. (11) In fact, all but one of the patients reported in this review recovered from their disease and surgery.

The issue of anticoagulation therapy for treating patients with septic thrombophlebitis of the inferior mesenteric vein is not resolved by this review. Filling defects seen in the inferior mesenteric vein in these patients have usually been attributed to thrombus. Yet in one of our patients, the opened gross specimen revealed fecal material in the mesenteric vein that appeared to be identical to material found in the colonic lumen. In this series, only two of the patients were given anticoagulant therapy, and they recovered as did the other patients who did not get anticoagulation. (11, McClenathan)

CONCLUSION

Septic phlebitis of the inferior mesenteric vein is an unusual condition which is usually a complication of diverticular disease of the colon. History, physical examination and even operative findings may deceptively underestimate the presence and severity of this septic process. Abdominal films and CT scanning are helpful identifying the presence of this condition. Most authors feel that septic phlebitis of the IMV warrants a surgical approach with resection of the abnormal colon and colostomy. Bowel preparation, resection and primary anastomosis was not done in any of these patients reviewed. Anticoagulation may not be necessary for several reasons. First, portal venous filling defects could

represent fecal material in some patients. Second, patients in this series who were not treated with anticoagulants appear to have done as well as the few patients where anticoagulation was used.

Figure 7

Table 1

Author	Date	Age	Sex	ABDOMINAL				CT	Barium Enema
				PAIN	TENDERNESS	LEUKOCYTOSIS	FEVER		
Graham ²	1975	58	F	NO	YES				
Juler ⁴	1976	35	M	YES	YES		YES		Yes
Smith ⁴	1978								Yes
Rothman ⁵	1981	37	M	YES	YES	“SLIGHT”	YES		Yes
Cambria ⁶	1982	61	M	MILD	MILD	12,600	YES		
Jensen ¹	1985	72	M	MILD	MILD		YES		
Jensen ³	1985	65	F	NO	NO				CT
Baer ⁷	1989	58	M	NO	NO	14,400	YES		CT
Lee ⁸	1996	43	M	MILD	YES		YES		CT
Molitch ⁹	1996	43	M	YES			YES		CT
Draghetti ¹⁰	1999	49	M	MILD	MILD	11,700	YES		CT
Sywak ¹¹	2003	61	M	MILD	MILD	NO	YES		CT
Domsajko ¹²	2007	57	F	MILD	MILD	9,600	YES		CT
McClenathan	2008	67	M	MILD	NO	23,000	NO		CT
McClenathan	2008	56	M	NO	NO	15,700	YES		CT

References

- Jensen JA, Tsang D, Minnis JF, Ponn T, Merrell RC. Pneumopylephlebitis and intramesocolic diverticular perforation. *Am J Surg.* 1985 Aug;150(2):284-7.
- Graham GA, Bernstein RB, Gronner AT. Gas in the portal and inferior mesenteric veins caused by diverticulitis of the sigmoid colon. Report of a case with survival. *Radiology.* 1975 Mar;114(3):601-2.
- Juler GL, Dietrick WR, Eisenman JJ. Intramesenteric perforation of sigmoid diverticulitis with nonfatal venous intravasation. *Am J Surg.* 1976 Nov;132(5):653-6.
- Smith HJ, Berk RN, Janes JO, Clayton RS, Williams JL. Unusual fistulae due to colonic diverticulitis. *Gastrointest Radiol.* 1978 Feb 23;2(4):387-92.
- Rothman BJ, Cloogman H, Wong D. Colovenous fistula complicating diverticulitis. Demonstration by contrast enema. *Am J Gastroenterol.* 1981 Jun;75(6):464-8.
- Cambria RP, Margolies MN. Hepatic portal venous gas in diverticulitis: survival in a steroid-treated patient. *Arch Surg.* 1982 Jun;117(6):834-5.
- Baer HM, Siegelbaum MH, Seidmon EJ, Kendall AR. Venous intravasation of barium into the inferior mesenteric vein mimicking a coloureteral fistula: a case report and literature review. *J Urol.* 1989 Jan;141(1):117-9.
- Lee L, Kang YS, Astromoff N. Septic thrombophlebitis of the inferior mesenteric vein associated with diverticulitis CT diagnosis. *Clin Imaging.* 1996 Apr-Jun;20(2):115-7.
- Molitch HI. Septic thrombophlebitis of the inferior mesenteric vein complicating sigmoid diverticulitis: CT findings. *AJR Am J Roentgenol.* 1996 Oct;167(4):1014-6.
- Draghetti MJ, Salvo AF. Gas in the mesenteric veins as a nonfatal complication of diverticulitis: report of a case. *Dis Colon Rectum.* 1999 Nov;42(11):1497-8.

11. Sywak M, Romano C, Raber E, Pasiaka JL. Septic thrombophlebitis of the inferior mesenteric vein from sigmoid diverticulitis. *J Am Coll Surg.* 2003 Feb;196(2):326-7.

12. Domajnko B, Kumar A, Salloum RM. Mesenteric venous thrombophlebitis--septic thrombophlebitis of the inferior mesenteric vein: an unusual manifestation of diverticulitis. *Am Surg.* 2007 Apr;73(4):404-6.

Author Information

James H. McClenathan, MD, FACS

Staff Surgeon, Kaiser Permanente Medical Center, Adjunct Clinical Professor of Surgery, Stanford University