Hepatic portal venous gas after colonoscopy: A case report and review

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ABSTRACT

INTRODUCTION: Hepatic portal venous gas (HPVG) is a rare radiological finding in which gas enters the portal venous system and it is associated in case of necrotizing colitis with a mortality of 75%. We report a case of iatrogenic HPVG with a review of literature.

PRESENTATION OF CASE: A 41 years old patient underwent total colectomy and ileal pouch-anal anastomosis with derivative ileostomy for a familiar adenomatous polyposis coli in June 2008. A stenosis of the pouch-anal anastomosis developed. The patient underwent several endoscopic dilations. A recurrence of the stenosis was observed. The patient underwent to several endoscopic procedure. After the last colonoscopy the patient showed a fever with abdominal pain. A CT scan showed little peri-anastomotic collections and massive hepatic portal venous gas.

DISCUSSION: The management of HPVG varied from surgical intervention to non-operative procedure. The surgical approach it’s reserved to clinically unstable patients or those with evidence of peritonitis or bowel perforation. Stable patients, like those with an HPVG consequence of an endoscopic procedure, can be treated with non-operative management.

CONCLUSION: Our experience confirm that hepatic portal venous gas can be related to endoscopic procedure; thus, it can be managed on the basis of patient’s general clinical conditions, and in selected cases it will disappear without therapeutic interventions with a good outcome.

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1. Introduction

Hepatic portal venous gas (HPVG) is a rare radiological finding in which gas enters the portal venous system and it is associated in case of necrotizing colitis [1] with a mortality of 75% [2].

In 2001 and 2009 Kinoshita [1] and Nelson [3] respectively, demonstrated a decrease of mortality up to 39%.

Different conditions are predisposing for HPVG such as, abdominal infections, bowel ischemia, gastric emphysema, Crohn’s disease or endoscopic procedures. In last years thanks to the development of radiological techniques such as CT scan and ultrasonography the diagnosis of case of HPVG is increased, with a better prognosis for iatrogenic cases (Figs. 1–4). Our work has been reported in line with the SCARE criteria [5].

2. Presentation of case

A 41 years old patient underwent total colectomy and ileal pouch-anal anastomosis with derivative ileostomy for a familiar adenomatous polyposis coli in June 2008. Pathologic examination of the specimen showed a pT1 N1 adenocarcinoma of the rectum. The patient underwent chemo-radiation and subsequent adjuvant chemotherapy. A stenosis of the pouch-anal anastomosis developed. The patient underwent several endoscopic dilations. The ileostomy was taken down in March 2016. A recurrence of the stenosis and a peri-anastomotic collection were observed. An endoscopic drainage of the collection was performed on October 3rd, 2016. The CT scan performed on October 7th showed a reduction of peri-anastomotic fluid collection without evidence of portal pneumatisos. The endoluminal drainage was removed and during an endoscopic procedure with CO2 the fistula was closed with an OVESCO® clip on October 10th. The patient was re-admitted on October 19th with fever (38.8 °C) without leucocytosis. An endoscopic examination of the pouch showed absence of purulent discharge but many fistulous orifices around the pouch-anal anastomosis were detected (Table 1).

A CT scan showed little peri-anastomotic collections (panel B) with air-fluid levels and massive hepatic portal venous gas (panel A). The patient was in good clinical conditions, apyretic, blood tests showed: WBC: 4290/µL, Procalcitonin: 010 ng/ml.

Based on clinical findings, antibiotic treatment with meropenem (500mg tid i.v.) was administered without further diagnostic or therapeutic interventions, assuming that the portal pneumatisos was due to the endoscopic examination. One day later a new CT scan detected a marked reduction of hepatic portal venous gas (panel C); the patient resumed oral feeding and three days later was discharged.

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Table 1

| Authors-years | Underlying clinical conditions | Number of patients |
|---------------|--------------------------------|--------------------|
| Vollman [8], 1976 | Necrotizing enterocolitis | 1 (infant) |
| Bach [9], 1982 | Intra-abdominal abscess | 1 |
| Birnberg [10], 1983 | Ulcerative colitis | 1 |
| Merritt [11], 1984 | Necrotizing enterocolitis | 12 (infants) |
| Benson [12], 1985 | Digestive tract dilation | 1 |
| Huycke [13], 1985 | Complication of endoscopic procedure | 1 |
| Radin [14], 1987 | Digestive tract dilation | 1 |
| Chezmar [15] 1989 | Liver transplant | 7 |
| Kirsch [16], 1990 | Crohn's disease | 1 |
| Lee [17], 1993 | Suppurative cholangitis | n.v |
| Herman [18], 1995 | Complication of endoscopic procedure | 1 |
| Quirke [19], 1995 | Ileus | 1 |
| Mallens [20], 1995 | Cystic fibrosis | 1 |
| Chen [21], 1997 | Seizures | 1 |
| Nguyen [22], 1998 | Complication of endoscopic procedure | 1 |
| Chang [23], 1999 | Gastric ulcer | 1 |
| Nakao [24], 1999 | Intra-abdominal abscess - tumor | 1 |
| Saksema [25], 2003 | Colchicine toxicity | 1 |
| Sellner [26], 2007 | diverticulitis | 1 |
| Sen [27], 2009 | diverticulitis | 1 |
| Hussain [28] 2009 | Gastric ulcer | 1 |
| Siswojo [29], 2010 | Mesenteric ischemia | 1 |
| Oehler [30], 2013 | Mesenteric ischemia | 1 |
| Cunningham [31], 2014 | Crohn's disease | 1 |
| Khalaf [32], 2014 | Mesenteric ischemia | 1 |
| Maetzawa [33], 2015 | Mesenteric ischemia | 1 |
| Satojoama [34] 2015 | Complication of endoscopic procedure | 1 |
| Solakoglu [35] 2016 | Complication of endoscopic procedure | 1 |
| Sawano [36] 2016 | Complication of endoscopic procedure | 1 |
| Castreen [37] 2016 | Complication of right hemicolectomy | 1 |
| Moser [38] 2016 | Complication of diverticulitis | 1 |
| Yamadera [39] 2016 | Crohn's disease | 1 |
| Nevins [40] 2016 | Dilated loops of small bowel | 1 |
| Okada [41] 2016 | Complication of abdominal surgery | 4 |
| Ginesu [42] 2017 | Complication of left colectomy | 1 |
| Bangash [43] 2017 | Complication of radical cystectomy and neobladder formation | 1 |
3. Discussion

Wolfe [4] in 1955 first described a case of HPVG in infants associated with serious underlying disease and high mortality rate. Finding of a relevant amount of gas in portal venous system has traditionally been associated with serious clinical conditions with poor outcome, as it happens in abdominal abscess or intestinal infarction [5]. HPVG is the result of accumulation of gas in the portal mesenteric system through veins or lymphatics of the intestinal wall [6].

In some cases, venous hepatic gas is an incidental finding and it has been described as a consequence of diagnostic or therapeutic invasive procedures such as surgery, hepatic artery embolization, operative endoscopic procedures [7].

The management of HPVG varied from surgical intervention to non-operative procedure. The surgical approach it’s reserved to clinically unstable patients or those with evidence of peritonitis or bowel perforation. Stable patients, like those with an HPVG consequence of an endoscopic procedure, can be treated with non-operative management. In our case, an abdominal abscess was present but clinical serious signs of sepis were absent. Probably in our patient the cause of HPVG was related to mucosa injury during the endoscopic procedure with subsequent quick absorption of gas from the intestine into the mesenteric, then portal, venous system. Generally, this condition has been related to acute intestinal ischemia, as a consequence of a bacterial translocation through a wall defect.

4. Conclusion

Our experience confirm that hepatic portal venous gas can be related to endoscopic procedure; thus, it can be managed on the basis of patient’s general clinical conditions, and in selected cases it will disappear without therapeutic interventions with a good outcome.

Conflicts of interest

All authors disclose any financial and personal relationships with other people or organisations.

Sources of funding

No sources of funding was used for this research.

Ethical approval

This study is exempt from ethical approval in our institution.

Consent

“Written informed consent was obtained from the patient for publication of this case report and accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal on request.”

Author contribution

G.T. Capoluolo MD PhD. - G. Mascianà MD – F. Carannante MD: Patient care and management; image contribution.
M. Caricato MD PhD FACS: revision and final approval of the manuscript.

Registration of research studies

N/A.

Guarantor

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