CASE REPORT – OPEN ACCESS

International Journal of Surgery Case Reports 33 (2017) 51–54

Contents lists available at ScienceDirect

International Journal of Surgery Case Reports

journal homepage: www.casereports.com

Haemorrhagic gastritis following Gastrografin administration for adhesive small bowel obstruction: A case report of a rare outcome

Stephen Guy[a,b,*], Mohammed Al Askari[b]

[a] Griffith University, Gold Coast, Australia
[b] Redland Hospital, Weippin Street, Cleveland, Queensland, 4163, Australia

ARTICLE INFO

Article history:
Received 21 November 2016
Received in revised form 19 February 2017
Accepted 19 February 2017
Available online 21 February 2017

Keywords:
Adhesive small bowel obstruction
Water-soluble contrast
Haemorrhage
Gastritis
Case report

ABSTRACT

INTRODUCTION: Adhesive small bowel obstruction (ASBO) is common after abdominal surgery. Water soluble contrast agents (WSCA) such as Gastrografin have been demonstrated to be safe and effective in predicting resolution of ASBO with conservative management while decreasing the time to resolution, decreasing the need for surgery and reducing overall length of stay. Few adverse effects have been reported. To the authors knowledge this is the first report of haemorrhagic gastritis following administration of Gastrografin for ASBO.

PRESENTATION OF CASE: We present a case of haemorrhagic gastritis following Gastrografin administration in a 69-year-old male with adhesive small bowel obstruction who was managed conservatively with a good outcome. The report complies with the criteria outlined in the SCARE statement (Product Information Gastrografin [Product information], 2013).

DISCUSSION: The characteristics, mechanism of action, safety profile and efficacy of Gastrografin in ASBO are discussed along with the possible mechanisms underlying the haemorrhagic gastritis.

CONCLUSION: This patient at high risk of gastropathy experienced haemorrhagic gastritis following administration of Gastrografin for adhesive small bowel obstruction. WSCA such as Gastrografin are usually safe and effective in ASBO however caution may be warranted in patients at high risk of gastropathy.

1. Introduction

Adhesive small bowel obstruction (ASBO) is common after abdominal surgery with an overall incidence of 2–20% [2,3]. Laparoscopic surgery has a lower incidence while open bowel surgery has a higher incidence [4]. This represents a substantial cost to the healthcare system and significant morbidity to the individual patient. Patients who develop ASBO and respond to non-operative management are admitted to hospital for an average stay of approximately 3 days. Length of stay is prolonged in patients that require surgery [5]. The condition is often recurrent. The presence of contrast in the colon on interval imaging following oral administration of Water Soluble Contrast Agents (WSCA) such as Gastrografin has been demonstrated to predict resolution of ASBO with conservative management. WSCA also decrease the time to resolution, decrease the need for surgery and reduce overall length of stay with few complications [6]. Haemorrhagic gastritis following administration of Gastrografin has not been previously reported.

2. Presentation of case

We present the case of a 69-year-old male who developed haemorrhagic gastritis post administration of Gastrografin for adhesive small bowel obstruction at a rural hospital in Queensland, Australia. The report was conducted with the written consent of the patient and complies with the criteria outlined in the SCARE statement [7].

The patient presented with intermittent abdominal pain and obstipation lasting 24 h. He reported similar symptoms during previous, recurrent episodes of adhesive small bowel obstruction. His previous episodes had resolved with conservative management.

His surgical history included an emergency laparotomy many years ago, for a perforated peptic ulcer. He was unsure of the details of the procedure. He reported multiple subsequent operations that included vagotomy, small bowel resection and repair of incisional hernia as well as repair of umbilical and bilateral inguinal hernias. His medical history included hypothyroidism, hypercholesterolaemia, gastroesophageal reflux disease and episodes of diverticulitis. He was treated for Helicobacter pylori infection 6 years prior. Follow-up urea breath test had confirmed eradication. He consumed 50 g of alcohol per day on average and quit smoking 25 years ago, following a 30-pack-year history. His regular medications included thyroxine, rosuvastatin and rabeprazole 20 mg once

* Corresponding author. Present Address: Redland Hospital, Weippin Street, Cleveland, Queensland, 4163, Australia.
E-mail address: stephen.guy2@health.qld.gov.au (S. Guy).

http://dx.doi.org/10.1016/j.ijscr.2017.02.030

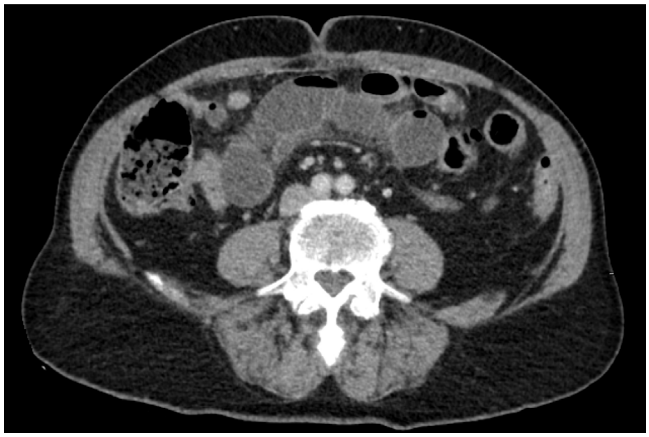


Fig. 1. CT abdomen in the transverse plane at the level of the umbilicus.

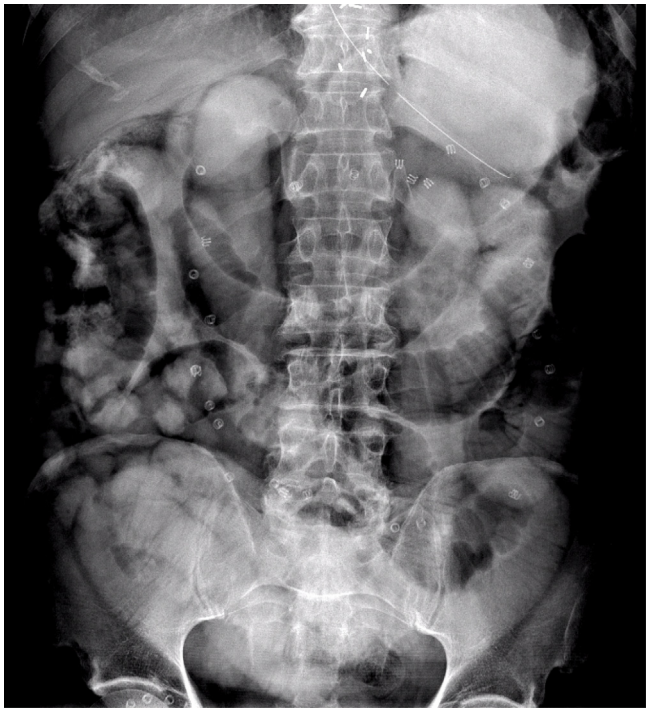


Fig. 2. Abdominal radiograph 6 h post administration of Gastrografin.

daily. He denied recent use of non-steroidal anti-inflammatory drugs.

He was of average body habitus. He was not distressed and had normal vital signs. He had a distended, tympanic abdomen without signs of peritonism. An abdominal computed tomography (CT) scan (Fig. 1) showed dilated, fluid filled loops of small bowel with a transition point in the periumbilical region supporting the diagnosis of adhesive small bowel obstruction.

He was admitted in the afternoon under the surgical team for conservative management. This consisted of withholding oral intake and providing intravenous fluid therapy. A nasogastric tube was not placed due to the absence of nausea and vomiting. His rabeprazole was continued. The next morning his symptoms and physical examination were unchanged and he was given 100 mL Gastrografin per oral at 0915. He reported abdominal pain at approximately 1030 and had a bilious emesis at 1400. A nasogastric tube was inserted and placed on free drainage with four hourly aspirates. An abdominal X-ray six hours later (Fig. 2) demonstrated contrast in the colon and he passed a large, loose bowel motion without blood or melaena.

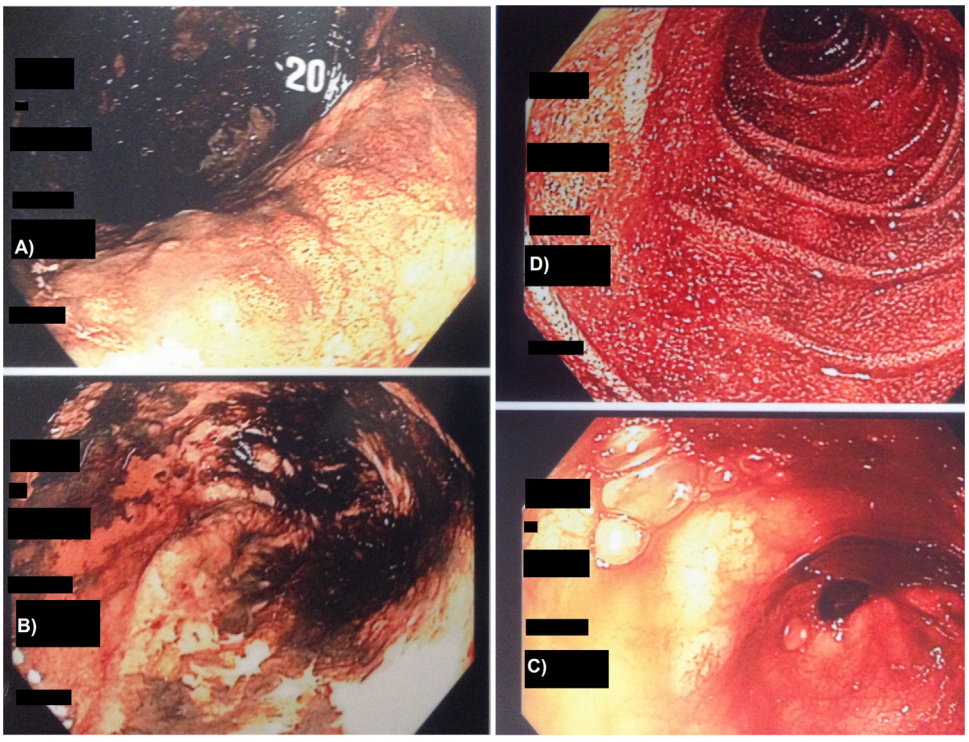
On the surgical ward round at 1800 he was noted to have blood staining of his nasogastric aspirates. He was comfortable and had a normal heart rate (85 bpm) and blood pressure (134/74 mmHg) with no signs of hypovolaemia. The blood was attributed to mucosal trauma on insertion and the decision made to continue routine observation. At 2015 (11 h post ingestion of the Gastrografin) he was noted to have a large amount of frank blood in his nasogastric tube. His heart rate had increased to 105 bpm and his blood pressure had decreased to 112/68 mmHg. Full blood count demonstrated a haemoglobin drop to 92 g/L, down from 140 g/L on admission. He was taken to theatre for emergency upper endoscopy by the consultant surgeon on-call which demonstrated a blood-filled stomach secondary to haemorrhagic gastritis. Thorough washout revealed no ulceration (Fig. 3). He was placed on a pantoprazole infusion and required transfusion of two units of red blood cells. He did not have recurrent haemorrhage and after 72 h his pantoprazole infusion was ceased. He was discharged home tolerating a soft diet with instructions to take rabeprazole 20 mg twice daily. On review four weeks later he was asymptomatic with no further evidence of haemorrhage. Repeat gastroscopy demonstrated mild proximal gastritis. Histopathologic examination of biopsies from the gastric antrum, body and gastroesophageal junction identified mild chronic gastritis and focal intestinal metaplasia, mild chronic gastritis, and chronic inflammation suggestive of reflux respectively. There was no atrophy, dysplasia or malignancy and no Helicobacter like organisms were seen. Helicobacter pylori urease (CLO) test was negative. He was discharged with advice to continue his rabeprazole. The Therapeutic Goods Administration was informed of the possible adverse effect following administration of Gastrografin.

3. Discussion

To the authors knowledge this is the first report of haemorrhagic gastritis following the administration of Gastrografin for adhesive small bowel obstruction. Although there was a temporal correlation, a causative relationship cannot be established. It occurred in a patient who consumed alcohol daily and had a prior history of peptic ulcer disease putting him at high risk of gastropathy. He was however receiving proton pump inhibitor therapy and had undergone prior vagotomy.

Gastrografin is a hyperosmolar WSCA listed on the Australian register of therapeutic goods since 1991 [1]. 100 mL Gastrografin solution contains 10 g sodium diatrizoate (sodium amidotrizoate) and 66 g meglumine diatrizoate (meglumine amidotrizoate). Its osmolarity is about 1900mOsm/L, which is approximately 6 times that of the extracellular compartment. It is inferior to barium sulphate in visualising the gastrointestinal mucosa but is preferred if there is risk of peritoneal contamination due to its solubility in water and decreased risk of subsequent peritonitis. In addition to known hypersensitivity, it is contraindicated in manifest hyperthyroidism due to its iodine content, in hypovolaemia due to resultant gastrointestinal fluid loss and in those at risk of aspiration or suspected broncho-oesophageal fistula due to the risk of pulmonary oedema and pneumonitis. In cases of prolonged retention of Gastrografin in the gastrointestinal tract (e.g. obstruction or stasis), tissue damage, bleeding, bowel necrosis and intestinal perforation may occur. These have been identified as rare complications (<1/1000). Gastropathy is not a listed adverse effect.

A meta-analysis by Ceresoli et al. [6] found WSCA were more than 90% sensitive and specific in predicting resolution of ASBO with conservative management if contrast reaches the large bowel on repeat imaging 4–36 h post administration. The PPV was 98% and NPV 75%. WSCA also reduced the need for surgery (OR 0.55,



A) Cardia and fundus

B) Body

C) Pyloric antrum

D) Duodenum

Fig. 3. Endoscopic view of haemorrhagic gastritis. A) Cardia and fundus B) Body C) Pyloric antrum D) Duodenum.

P = 0.003), reduced length of stay by 2 days (P < 0.00001), and reduced time to resolution by 28 h (P < 0.00001). WSCA did not increase the risk of complications or mortality. It has been proposed the high osmolarity of WSCA increases the pressure gradient across the obstruction, reduces bowel oedema, increases luminal content and enhances small bowel motility.

Studies to date have demonstrated a very low rate of complications related to WSCA administration in ASBO [3,8–13] Rare anaphylactoid reactions following administration have been described [14]. Aspiration pneumonitis and pulmonary oedema have been reported which, although rare, can be fatal [15].

Gastritis represents an imbalance between mucosal injury and repair. Acute causes include infection (especially Helicobacter pylori), caustic ingestion and ulcero-haemorrhagic. The latter occurs typically in the presence of ischaemia secondary to shock [16]. Other aetiologies include reactive (bile reflux), iatrogenic (e.g. secondary to iron therapy, colchicine, or sorbitol), radiation, autoimmune, inflammatory granulomatous, lymphocytic, collagenous, eosinophilic, and vascular gastropathies. In this case biopsies were not performed during the emergency upper endoscopy due to the presence of haemorrhagic gastritis. It is not possible to confirm the underlying acute pathologic mechanism/s. Follow-up biopsies confirmed gastritis without identifying a specific aetiology. Given the patient's risk factors and the temporal correlation with Gastrografin administration, a multifactorial aetiology for the haemorrhagic gastritis is suspected.

4. Conclusion

This patient at high risk of gastropathy experienced haemorrhagic gastritis following administration of Gastrografin for adhesive small bowel obstruction. The authors advocate for the use of Gastrografin in adhesive small bowel obstruction given the robust evidence for its efficacy and safety in selected patients, however caution may be warranted in patients at high risk of gastropathy.

Informed consent

The patient provided written consent for the preparation and publication of this case report.

Conflict of interest

The authors have no conflicts of interest to declare.

Ethical approval

This report was granted exemption from Human Research Ethics Committee review by the chair of the Central Queensland Hospital and Health Service Human Research Ethics Committee and (reference number HREC/16/QCQ/37).

Author contributions

Dr Guy performed the chart and literature review and wrote the case report with the assistance of Dr Al Askari.

Sources of funding

This project received no funding.

Guarantor

The guarantor is Dr Stephen Guy.

References

[1] Product Information Gastrografin [Product Information], Bayer Australia Ltd, 2013 ([updated 01/07/2013. Available from: http://www.bayerresources.com.au/resources/uploads/PI/file9348.pdf).
[2] G. Barmparas, B.C. Branco, B. Schnuriger, L. Lam, K. Inaba, D. Demetriades, The incidence and risk factors of post-laparotomy adhesive small bowel obstruction, Gastrointest. Surg. 14 (10) (2010) 1619–1628.
[3] T. Loftus, F. Moore, E. VanZant, T. Bala, S. Brakenridge, C. Croft, et al., A protocol for the management of adhesive small bowel obstruction, J. Trauma Acute Care Surg. 78 (1) (2015) 13–21.
[4] D.D. Klaristenfeld, E.C. McLemore, B.H. Li, M.A. Abbass, M.A. Abbas, Significant reduction in the incidence of small bowel obstruction and ventral hernia after laparoscopic compared to open segmental colorectal resection, Langenbecks Arch. Surg. 400 (4) (2016) 505–512.
[5] P.A. Bilderback, J.D. Massman 3rd, R.K. Smith, D. La Selva, W.S. Helton, Small Bowel obstruction is a surgical disease: patients with adhesive small bowel obstruction requiring operation have more cost-effective care when admitted to a surgical service, J. Am. Coll. Surg. 221 (1) (2017) 7–13.
[6] M. Ceresoli, F. Coccolini, F. Catena, G. Montori, S. Di Saverio, M. Sartelli, et al., Water-soluble contrast agent in adhesive small bowel obstruction: a systematic review and meta-analysis of diagnostic and therapeutic value, Am. J. Surg. 211 (6) (2016) 1114–1125.
[7] R.A. Agha, A.J. Fowler, A. Saeta, I. Barai, S. Rajmohan, D.P. Orgill, et al., The SCARE statement: consensus-based surgical case report guidelines, Int. J. Surg. 34 (2016) 180–186.
[8] J. Burge, S.M. Abbas, G. Roadley, J. Donald, A. Connolly, I.P. Bissett, et al., Randomized controlled trial of Gastrografin in adhesive small bowel obstruction, ANZ J. Surg. 75 (8) (2016) 672–674.
[9] H.K. Choi, K.W. Chu, W.L. Law, Therapeutic value of gastrografin in adhesive small bowel obstruction after unsuccessful conservative treatment: a prospective randomized trial, Ann. Surg. 236 (1) (2002) 1–6.
[10] C. Trésallet, N. Lebreton, B. Royer, P. Leyre, G. Godiris-Petit, F. Menegaux, Improving the management of acute adhesive small bowel obstruction with CT-scan and water-soluble contrast medium: a prospective study, Dis. Colon Rectum 52 (11) (2009) 1869–1876.
[11] S. Abbas, I. Bissett, B. Parry, Meta-analysis of oral water-soluble contrast agent in the management of adhesive small bowel obstruction, Br. J. Surg. 94 (4) (2007) 404–411.
[12] S. Di Saverio, F. Catena, L. Ansaloni, M. Gavioli, M. Valentino, A.D. Pinna, Water-soluble contrast medium (gastrografin) value in adhesive small intestine obstruction (ASIO): a prospective, randomized, controlled, clinical trial, World J. Surg. 32 (10) (2008) 2293–2304.
[13] B. Branco, G. Barmparas, B. Schnüriger, K. Inaba, L. Chan, D. Demetriades, Systematic review and meta-analysis of the diagnostic and therapeutic role of water-soluble contrast agent in adhesive small bowel obstruction, Br. J. Surg. 97 (4) (2010) 470–478.
[14] J. Skucas, Anaphylactoid reactions with gastrointestinal contrast media, AJR Am. J. Roentgenol. 168 (4) (1997) 962–964.
[15] D. Trulzsch, A. Penmetsa, A. Karim, D. Evans, Gastrografin-induced aspiration pneumonia: a lethal complication of computed tomography, South. Med. J. 85 (12) (1992) 1255–1256.
[16] A. Srivastava, G.Y. Lauwers, Pathology of non-infective gastritis, Histopathology 50 (1) (2007) 15–29.