Pain Physician 2009; 12:1001-1003 • ISSN 1533-3159

Case Report

Hemorrhagic Gastritis and Duodenitis Following Celiac Plexus Neurolysis

Scott Pello, MD, Alan Miller, MD, Tony Ku, MD, and Dajie Wang, MD

From: Thomas Jefferson University Hospital, Philadelphia, PA.

Address correspondence:
Scott Pello, MD
Thomas Jefferson University Hospital
Dept. of Neurology
900 Walnut Street
Philadelphia, PA 19107
E-mail: scott.pello@jeffersonhospital.org

Disclaimer: There was no external funding in the preparation of this manuscript.
Conflict of interest: None.

Manuscript received: 06/16/2009
Revised manuscript received: 09/21/2009
Accepted for publication: 10/27/2009

Free full manuscript: painphysicianjournal.com

Introduction: Neurolytic celiac plexus block is a well established intervention to palliate pain, and it potentially improves quality of life in patients suffering from an upper abdominal malignancy, specifically pancreatic cancer.

Methods: We describe a 61-year-old female with a history of pancreatic cancer, unexplained transfusion dependent anemia with a normal recent upper endoscopy, and abdominal pain, who had previously undergone gastrojejunostomy and a Roux-en-Y hepaticojejunostomy as well as chemotherapy and radiation therapy. She suffered from intractable abdominal pain and elected to undergo palliative celiac plexus neurolysis.

Results: The patient initially appeared to tolerate celiac plexus block well, however, 45 minutes after the procedure, the patient had bright red blood per rectum followed by bloody diarrhea. Her abdomen was soft and non-tender with minimal distention and positive bowel sounds. The patient's hemoglobin decreased to 7.5 g/dl from 9.0 g/dl, and she received a blood transfusion. Upper endoscopy and enteroscopy demonstrated diffuse hemorrhagic gastritis and duodenitis. The bleeding was controlled and the patient remained hemodynamically stable. Ultimately, the patient did well and was discharged home.

Discussion: We report a case of a patient with known history of gastritis and duodenitis, who developed severe upper GI bleeding immediately following the celiac plexus neurolysis. There are no published reports documenting similar cases. It is difficult to offer a precise physiologic explanation for this complication. However, we speculate that inhibition of sympathetic tone from the celiac plexus neurolysis caused increased blood flow to the GI system, and this resulted in active bleeding from previously indolent hemorrhagic gastritis and duodenitis.

Conclusion: It may be beneficial for patients with a history of gastritis, duodenitis or GI bleeding to undergo a careful upper GI evaluation prior to celiac plexus neurolysis.

Key words: Case report, pancreatic cancer, celiac plexus neurolysis, anemia, hemorrhagic gastritis and doudenitis, sympathetic block

Pain Physician 2009; 12:1001-1003

Pancreatic cancer can be accompanied by severe abdominal pain and has as a 5-year survival rate of only 4% (1). The incidence of pancreatic cancer is 8.8 per 100,000 (2). Pain management is an important aspect of care for patients with pancreatic cancer. Neurolytic celiac plexus block is a well established intervention to palliate pain originating from pancreatic cancer which could potentially improve quality of life (3).

The celiac plexus lies below the diaphragm, approximately at the level of the first lumbar vertebrae. It is composed of a dense network of sympathetic nerve fibers that travel in parallel to the anterior surface of the abdominal aorta and the origin of the

celiac artery. The celiac plexus transmits pain signals originating from all abdominal viscera and the majority of pelvic viscera, including the pancreas, liver, gallbladder, stomach, renal pelvis, ureter, and intestine proximal to the transverse colon (4). The most frequent indication for celiac plexus neurolysis is pain secondary to an upper abdominal malignancy, specifically pancreatic cancer, although it is also effective for pain generated by retroperitoneal tumors or metastases (5).

Case Report

A 61-year-old female with history of pancreatic cancer, anemia, and abdominal pain was admitted for elective neurolytic celiac plexus block under fluoroscopic guidance. She underwent gastrojejunostomy and a Roux-en-Y hepaticojejunostomy in July of 2007. She subsequently received chemotherapy and radiation which was completed in March of 2008. In August of 2008 the patient was found to have occult blood in her stool. Colonoscopy revealed no pathology. Esophagogastroduodenoscopy (EGD) revealed mild gastritis but no evidence of active bleeding. The patient remained stable and no gastrointestinal intervention was required. She continued to suffer from significant abdominal pain, and elected to undergo palliative celiac plexus neurolysis in November of 2008. In the month prior to the neurolysis, the patient denied melena or blood in the stool.

The patient underwent celiac plexus neurolysis in the operating room. Using a posterior approach, the mid-point of L1 was marked. The needle entry point was 7 cm to the left of midline and 3 cm inferior to the rib cage. The skin entry site was anesthetized with 1% lidocaine. A 5-inch 22-gauge spinal needle was inserted and directed to the left anterior lateral aspect of the L1 vertebral body under fluoroscopic guidance. Using the same technique, a second needle was then placed to the right anterior lateral aspect of the L1 vertebral body. After negative aspirations for blood, 4 mL of Omnipaque was injected through each of the needles. The contrast spread was visualized in the anterior lateral aspect of the vertebral bodies of T11, T12, and L1. For diagnostic and prognostic purposes, 6 mL of 1% lidocaine was injected through each of the needles. The patient reported complete resolution of her abdominal pain 5 minutes after the injection. Five mL of 0.5% bupivacaine containing epinephrine 1:2000 dilution was then injected to prevent increased pain associated with initial alcohol injection. Ten minutes later, 10 mL of 100% alcohol was slowly injected through each of the needles for neurolysis. The needles were then removed at the end of the injection.

The patient tolerated the procedure well and was discharged to the recovery room in stable condition. Forty-five minutes after the procedure, the patient noted bright red blood per rectum followed by bloody diarrhea. Her vital signs remained stable, without tachycardia or hypotension. Pertinent physical examination findings were soft, non-tender abdomen with minimal distention and positive bowel sounds. Rectal exam showed normal tone with heme-positive stool and no evidence of active anorectal bleeding.

The patient's hemoglobin decreased to 7.5 from 9.0, and she received a blood transfusion. Within a few hours, she underwent an upper endoscopy with evaluation of the esophagus, stomach, duodenum, and proximal jejunum to a distance of 60 cm from the mouth. This demonstrated diffuse hemorrhagic gastritis with areas of active bleeding in the antrum. Hemorrhagic duodenitis was also visualized. The esophagus and jejunum were unremarkable. The bleeding was stopped with Argon plasma coagulation (APC) and the patient remained hemodynamically stable. Lower endoscopy was not performed because active bleeding was discovered on upper endoscopy. Hemoglobin remained stable with no further episodes of bleeding and the patient was subsequently discharged home.

The patient returned for follow-up approximately 6 weeks later and reported that she has remained pain free since the procedure. Upper endoscopy at that time revealed no evidence of active bleeding with normal jejunal mucosa. However, the antrum and duodenum were diffusely edematous, erythematous, and friable, consistent with tumor infiltration.

Discussion

In this case report, we present a patient suffering from abdominal pain secondary to pancreatic cancer. She underwent palliative celiac plexus neurolysis for abdominal pain and subsequently developed hemorrhagic gastritis and duodenitis. The question remains regarding the relationship of the celiac plexus block to the GI bleed in the setting of uncontrolled diffuse gastritis and duodenitis. We believe that by blocking the sympathetic innervations of the celiac plexus, there was an overwhelming parasympathetic influence over this area, resulting in increased blood flow. In this case of a woman with recent unexplained anemia requiring blood transfusion and a history of

gastritis but otherwise unremarkable EGD, it is likely the inhibition of sympathetic tone resulting from the celiac plexus block/neurolysis that potentially opened the "floodgates" of unopposed parasympathetic activity (9). Unopposed parasympathetic activity allowed for increased acid secretion, blood flow, etc., ultimately resulting in the unmasking of indolent hemorrhagic gastritis and duodenitis. Upper GI bleeding may result in passage of bright red blood per rectum if there is a rapid enteral transit time (10), which likely occurred in this case.

Lillemore et al (6) suggest that significant pain relief may be achieved following celiac plexus neurolysis for approximately 3 to 4 months prior to the return of severe pain. Another study demonstrated a considerable decrease in the need for daily analgesic use following celiac plexus neurolysis (7). A prospective, randomized, double-blind study involving 137 patients with histologically proven unresectable pancreatic cancer showed an increase in survival time in those patients who received neurolysis (6). However, another double-blind, randomized clinical trial by Wong et al (8) revealed no statistically significant differences in quality of life and survival time between the neurolytic celiac plexus group and systemic analgesic therapy alone. In both studies, the pain relief following celiac plexus neurolysis was clearly demonstrated. Bleeding is one of the most severe potential complications when this procedure is performed. Therefore, it is imperative to screen for patients who are at high risk for developing adverse effects from the procedure. The findings we present suggest the need for further studies to help illustrate the potential for GI bleed following celiac plexus neurolysis.

We report a case of a patient with known history of gastritis and duodenitis, who developed severe upper GI bleeding immediately following the celiac plexus neurolysis. Upper endoscopy and enteroscopy within a few hours after the procedure revealed diffuse hemorrhagic gastritis and bleeding requiring APC. There are no published reports documenting similar cases. It is difficult to offer a precise physiologic explanation for this complication. We believe that in this case it is unlikely that the needles positioned in the paravertebral region posterior to the major vessels caused bleeding in the GI tract. We speculate that inhibition of sympathetic tone from the celiac plexus neurolysis caused increased blood flow to the GI system, and this resulted in active bleeding from previously indolent hemorrhagic gastritis and duodenitis. Therefore, it may be beneficial for patients with a history of gastritis, duodenitis, or GI bleeding to undergo a careful upper GI evaluation prior to celiac plexus neurolysis.

References

1. Am. Cancer Soc. *Cancer Facts and Figures.* Am. Cancer Soc, Atlanta, GA, 2007.
2. Ries LAG, Eisner MP, Kosary CL, Hankey BF, Miller BA, Clegg LX, Edwards BK, (eds.). *SEER Cancer Statistics Review, 1973–1997.* National Cancer Institute, Bethesda, MD, 2000, NIH Publication No. 00–2789.
3. Mercadante S, Nicosia F. Celiac plexus block: A reappraisal. *Reg Anesth Pain Med* 1998; 23:524.
4. Lee JM. CT-guided celiac plexus block for intractable abdominal pain. *J Korean Med Sci* 2000; 15:173-178.
5. Mercadante S, Nicosia F, Celiac plexus block: A reappraisal. *Reg Anesth Pain Med* 1998; 23:37-48,
6. Lillemore KD, Cameron JL, Kaufman HS, Yeo CJ, Pitt HA, Sauter PK. Chemical splanchnicectomy in patients with unresectable pancreatic cancer. *Annals of Surgery* 1993; 217:447-457.
7. Romanelli DF, Beckmann CF, Heiss FW. Celiac plexus block: Efficacy and safety of the anterior approach. *American Journal of Roentgenology* 1993; 160:497-500.
8. Wong G, Schroeder D, Carns P, Wilson J, Martin D, Kinney M, Mantilla C, Warner D. Effect of neurolytic celiac plexus block on pain pelief, quality of life, and survival in patients with unresectable pancreatic cancer. *JAMA* 2004; 291:1092-1099.
9. Buckley NM, Brazeau P, Frasier ID, Gootman PM. Circulatory effects of splanchnic nerve stimulation in developing swine. *Am J Physiol* 1985; 248: H69-74.
10. Fleisher G, Ludwig S, Henretig F. *Textbook of Pediatric Emergency Medicine,* Vol 355. Lippincott Williams & Wilkins Philadelphia, PA, 2006, p. 316.