Clinical Medicine Insights: Pathology

SHORT REPORT

Steroid-Induced Sigmoid Diverticular Perforation in a Patient with Temporal Arteritis: A Rare Clinical Pathology

Bulent Kaya, Orhan Aras, Orhan Bat, Nuriye Esen Bulut and Kemal Memisoglu

Fatih Sultan Mehmet Training and Research Hospital, Department of General Surgery, Istanbul, Turkey.
Corresponding author email: drbkaya@yahoo.com

Abstract: Corticosteroids are used in the treatment of many rheumatological diseases including temporal arteritis. The gastrointestinal perforation during corticosteroid treatment is a serious complication. Colon perforation after steroid use was first reported by Beck et al in 1950.[1] Although the pathophysiological mechanism is not understood clearly, it is claimed that steroids probably by disturbing the intestinal mucosal barrier, facilitate the intestinal perforation. The long term treatment with corticosteroids increases the risk of colon perforation. We are presenting a patient who was taking corticosteroid due to temporal arteritis for two years and operated with sigmoid diverticular perforation.

Keywords: sigmoid diverticulitis, perforation, steroid treatment

Clinical Medicine Insights: Pathology 2012:5 11–14

doi: 10.4137/CPath.S7924

This article is available from http://www.la-press.com.

Case

A 78 year-old woman presented to our emergency department with abdominal pain, nausea and vomiting for five days. She had been diagnosed with diabetes mellitus and arterial hypertention. She was using prednisone 48–80 mg per day for two years. She was also taking diclofenac sodium 100 mgr/day. Patient's vital signs: Arterial blood pressue: 150/90 mmHg, Pulse rate: 110/min, Axillary temperature: 38 °C. In physical examination, there was rebound tenderness and muscular rigidity in all abdominal quadrants. The bowel sounds were decreased. Rectal ampulla was empty in digital examination. Laboratory findings; White blood cell count: 16.5 K/UL (4.8–10.8), Hemoglobin: 9.7 gr/dL (12–18), AST: 18 U/L (10–42), ALT: 12 U/L (10–40), Urea: 22.2 mg/dL (4.6–23), Creatine: 1.25 mg/dL (0.6–1.3). There was free air below right diaphragm in abdominal x- ray. The abdominal ultrasonography revealed dilatation in small intestine with minimal intraabdominal fluid. The patient was explorated with the diagnosis of gastrointestinal perforation. In exploration, there was reactive fluid in the abdominal cavity. A small diverticular perforation on the anti-mesenteric side of the sigmoid colon was detected. The diameter of the perforation was about 0.2–0.3 cm. The multiple biopsies were taken from perforated area. After debridation of perforated region, the defect was primarily repaired with 3/0 vicryl sutures. The postoperative period was uneventfull. There was no leakage or abscess formation in postoperative period (Fig. 1). The histopathological examination revealed a diverticular ulcer with perforation.

Discussion

Colonic diverticular disease is a common condition in old population. While most of the patients are asymptomatic, it can be presented with acute infection,

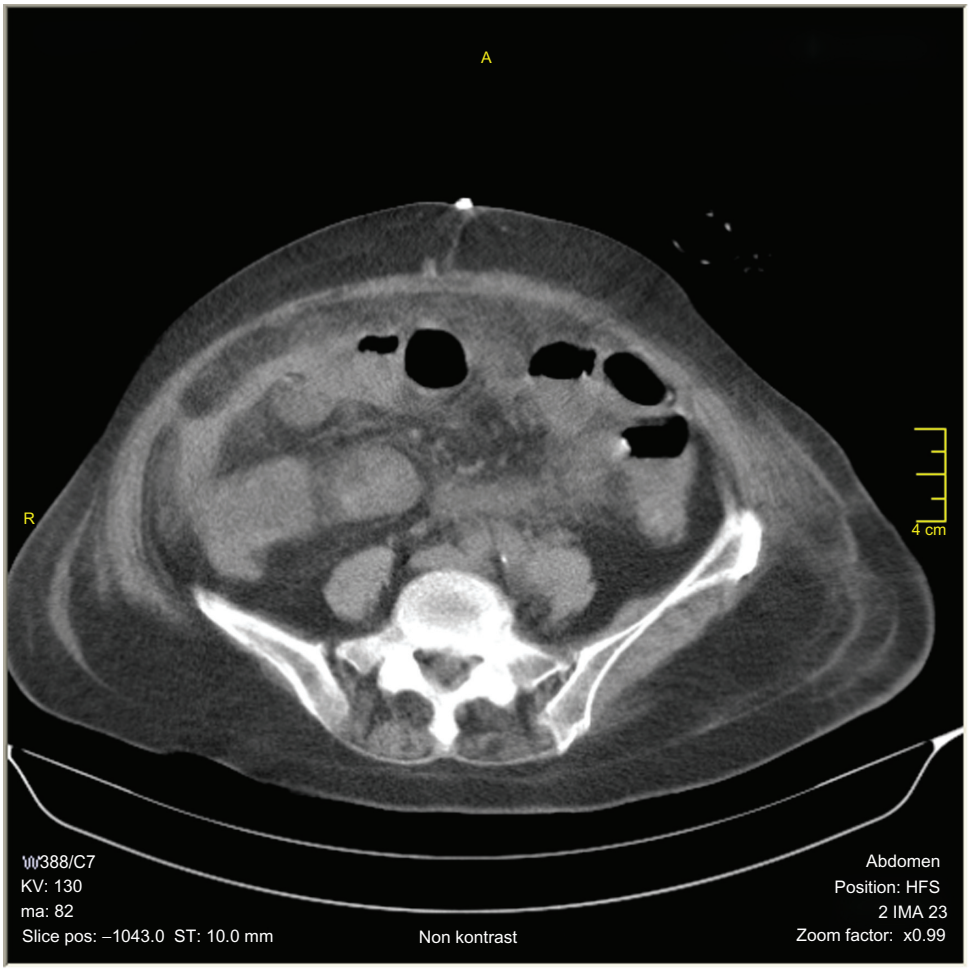

Figure 1. Abdominal computed tomography after surgery. There is no leakage or abscess formation after primary repair.

perforation and abscess formation. Severity of acute diverticulitis is usually evaluated with Hinchey classification (Table 1).

Corticosteroids disturb the intestinal mucosal repair system by preventing protein synthesis. Distorded mucosal surface is prone to bacterial colonization. The prostocyclines are synthesized in intestinal mucosal surface and associated with local defence. Corticosteroids also disturb the intestinal mucosal defence by inhibiting prostocycline synthesis. The peritonitis that develops in these patients usually have a silent course due to changes in inflammatory cells after steroid treatment. Fadul et al reported that the time in between beginning of the symptoms and diagnosis of peritonitis may change 1 to 14 days in patients under steroid theraphy.[2] Our patient had been admitted to the emergency room two times. The diagnosis of sigmoid colon perforation was established after 5 days of her symptoms.

Sigmoid colon perforation under corticosteroid treatment was reported in the literature.[3,4] Piekarek et al studied 54 patients with diverticular perforation and concluded that corticosteroids increase the risk of perforation in these patients.[5] It was stated that diverticular disease has a six times more mortality rate in patients with rheumatoid arthritis.[6] These patients are generally treated with non-steroid anti-inflammatory drugs (NSAID) combined with steroids. NSAID also increase the perforation risk. Our patient was also taking NSAID with the steroid.

Sigmoid diverticular perforation was treated with sigmoid colon resection and proximal colostomy for a long time. This surgical procedure is a relatively invasive approach in era of laparoscopy. Laparoscopic lavage (LL) was introduced recently.[7,8] The perforated colonic region is explorated, primarily repaired and drained without any ostomy. Myers E et al operated 92 patients by LL and they detected only 4 recurrent diverticulitis in 36 months follow up.[9] They recommended LL for most of the patients with diverticular perforation.

Table 1. Hinchey classification.

Stage I	Diverticulitis with confined paracolic abscess
Stage II	Diverticulitis with distant (pelvic, retroperitoneal) abscess
Stage III	Diverticulitis with purulent peritonitis
Stage IV	Diverticulitis with fecal peritonitis

In conclusion, the number of patients treated with steroids were increased in last years. The steroids increase the risk of colon perforation, specially in geriatric population. Gastrointestinal perforations including sigmoid diverticular perforation should always be included in differential diagnosis of patients under steroid treatment with acute abdominal pain.

Author Contributions

Conceived and designed the experiments: BK, OA. Analysed the data: BK, OB, NEB. Wrote the first draft of the manuscript: BK. Contributed to the writing of the manuscript: OA. Agree with manuscript results and conclusions: BK, OA, OB, NEB, KM. Jointly developed the structure and arguments for the paper: BK, OA. Made critical revisions and approved final version: BK, KM. All authors reviewed and approved of the final manuscript.

Disclosures and Ethics

As a requirement of publication author(s) have provided to the publisher signed confirmation of compliance with legal and ethical obligations including but not limited to the following: authorship and contributorship, conflicts of interest, privacy and confidentiality and (where applicable) protection of human and animal research subjects. The authors have read and confirmed their agreement with the ICMJE authorship and conflict of interest criteria. The authors have also confirmed that this article is unique and not under consideration or published in any other publication, and that they have permission from rights holders to reproduce any copyrighted material. Any disclosures are made in this section. The external blind peer reviewers report no conflicts of interest.

References

1. Beck JC, Browne JSL, Johnson LG, et al. Occurrence of peritonitis during ACTH administration. *Can Med Assoc J*. 1950;62:423–6.
2. Fadul CE, Lemann W, Thaler HT, Posner JB. Perforation of the gastrointestinal tract in patients receiving steroids for neurologic disease. *Neurology*. 1988;38:348–52.
3. Weiner HLRA, Cooper PR. Sigmoid diverticular perforation in neurosurgical patients receiving high-dose corticosteroids. *Neurosurgery*. 1993;33:40–3.
4. Mpofu SMC, Hutchinson D, Maier AE, Dodd SR, Moots RJ. Steroids, non-steroidal anti-inflammatory drugs, and sigmoid diverticular abscess perforation in rheumatic conditions. *Ann Rheum Dis*. 2004;63:588–90.
5. Piekarek K, Israelsson LA. Perforated colonic diverticular disease: the importance of NSAIDs, opioids, corticosteroids, and calcium channel blockers. *Int J Colorectal Dis*. 2008;23:1193–7.

6. Myllykangas-Luosujarvi R. Diverticulosis—a primary cause of life threatening complications in rheumatoid arthritis. *Clin Exp Rheumatol*. 1995;13:79–82.
7. O'Sullivan GC, Murphy D, O'Brien MG, Ireland A. Laparoscopic management of generalized peritonitis due to perforated colonic diverticula. *Am J Surg*. 1996;171:432–4.
8. Taylor CJ, Layani L, Ghusn MA, White SI. Perforated diverticulitis managed by laparoscopic lavage. *ANZ J Surg*. 2006;76:962–5.
9. Myers E, Hurley M, O'Sullivan GC, Kavanagh D, Wilson I, Winter DC. Laparoscopic peritoneal lavage for generalized peritonitis due to perforated diverticulitis. *Br J Surg*. 2008;95:97–101.