Annals of Medicine and Surgery 10 (2016) 57–60

Contents lists available at ScienceDirect

Annals of Medicine and Surgery

journal homepage: www.annalsjournal.com

Case report

Sigmoid colon diverticula perforation associated with sevelamer hydrochloride administration: A case report

Takahisa Yamaguchi [a, *], Shigekazu Ohyama [a], Hiroyuki Furukawa [a], Nariatsu Sato [a], Ichiro Ohnishi [a], Satomi Kasashima [b], Atsuhiro Kawashima [b], Masato Kayahara [a]

[a] National Hospital Organization, Department of Surgery, Kanazawa Medical Center, 1-1 Shimo-Ishibiki, Kanazawa, Ishikawa 920-8650, Japan
[b] National Hospital Organization, Department of Pathology, Kanazawa Medical Center, 1-1 Shimo-Ishibiki, Kanazawa, Ishikawa 920-8650, Japan

HIGHLIGHTS

- Sevelamer may contribute to colonic perforation in hemodialysis patients.
- Our patient underwent resection of a perforated portion of sigmoid colon.
- Histopathologically, sevelamer crystals were detected at the site of perforation.

ARTICLE INFO

Article history:
Received 5 May 2016
Received in revised form
24 July 2016
Accepted 24 July 2016

Keywords:
Sevelamer crystal
Colon perforation
Chronic renal failure
Hemodialysis

ABSTRACT

Introduction: Sevelamer is an anion exchange resin used to treat hyperphosphatemia. A common adverse effect of sevelamer is constipation. According to a review of the available literature, colon perforation associated with this resin agent was less common.

Presentation of case: A 66-year-old man complaining of lower abdominal pain was transferred to our hospital. The patient had been undergoing hemodialysis for chronic renal failure due to rapidly progressive glomerulonephritis, and had been receiving sevelamer hydrochloride 4.5 g/day for 8years as treatment for hyperphosphatemia. Abdominal computed tomography revealed ascites, free air in the abdominal cavity, multiple diverticula of the sigmoid colon, as well as increased fat tissue surrounding the sigmoid colon. We diagnosed colonic perforation and performed emergency surgery, which revealed a 5 × 5 mm perforation in the sigmoid colon surrounded with soft stool. Histopathologically, sevelamer crystals were detected at the perforation site.

Discussion: We theorize that physical stimulation by sevelamer crystals contributed to colon perforation at the already vulnerable diverticulum site.

Conclusion: When sevelamer is administered to patients with hemodialysis, the risk of intestinal perforation should be considered.

1. Introduction

Sevelamer is an anion exchange resin used to treat hyperphosphatemia in patients with chronic renal disease [1,2]. It was first approved by the United States Food and Drug Administration in October 1998 as sevelamer hydrochloride (Renagel®), and more recently as sevelamer carbonate (Renvela®). Sevelamer is calcium free, and therefore does not result in the hypercalcemia and vascular calcification linked to calcium-based agents [3–5]. This advantage has contributed to the increased use of sevelamer. The most commonly reported adverse effects of sevelamer are gastrointestinal events including abdominal bloating, diarrhea, constipation and intestinal obstruction [6–9]. Though concerns exist that sevelamer may increase the risk of intestinal perforation, there is little written in the literature on this topic. Here we describe a case of sigmoid colon perforation during treatment with sevelamer hydrochloride. Histopathologically, sevelamer crystals were detected at the site of perforated sigmoid colon.

* Corresponding author.
E-mail address: takahisa.1003@gmail.com (T. Yamaguchi).

http://dx.doi.org/10.1016/j.amsu.2016.07.020

2. Presentation of case

A 66-year-old man complaining of severe lower abdominal pain was transferred to our hospital in July 2014. His medical history was significant for left renal cancer, which was treated with renal resection. He had been undergoing hemodialysis for chronic renal failure secondary to rapidly progressive glomerulonephritis. Additionally, he had been receiving sevelamer hydrochloride (Renagel®) 4.5 g/day for 8 years, to treat hyperphosphatemia, and sodium polystyrene sulfonate (Kayexalate) 10 g/day for 10 years, to treat hyperkalemia. Physical examination on admission revealed a Glasgow coma score of E4 V5 M6, blood pressure of 150/80 mm Hg, pulse of 110 bpm, and temperature of 37.8 °C. Abdominal distension, overall tenderness, and muscular guarding were also noted. Laboratory results showed a significant increase in inflammatory response, with a white blood cell count of 14,400/μl and C-reactive protein of 31.2 mg/dl. Blood urea nitrogen was 51.7 mg/dl, and creatinine 11.0 mg/dl. Computed tomography revealed ascites, free air in the abdominal cavity, multiple diverticula of the sigmoid colon, as well as increased fat tissue surrounding the sigmoid colon (Fig. 1). We diagnosed colonic perforation and performed emergency surgery. Surgical findings revealed a 5 × 5 mm perforation in the sigmoid colon surrounded with soft stool (Fig. 2). The sigmoid colon, including the perforation site, was resected, and a colostomy was created in the transverse colon. Diverticula were evident in the resected colon. Histopathologically, the perforated colon revealed sevelamer crystals displayed as broad, curved, and irregularly spaced "fish scales" with a characteristic two-toned color, imparted by bright pink linear accentuations with a rusty yellow background. Violet Kayexalate crystals were seen on hematoxylin and eosin staining. (Fig. 3a). On Periodic acid–Schiff staining, sevelamer crystals maintained their internal fish scale appearance with violet color, as opposed to Kayexalate crystals, which were negative. (Fig. 3b). The final diagnosis was ruptured diverticulum associated with sevelamer and Kayexalate crystals. The postoperative course was uneventful, and the patient was discharged from the hospital 1 month after admission.

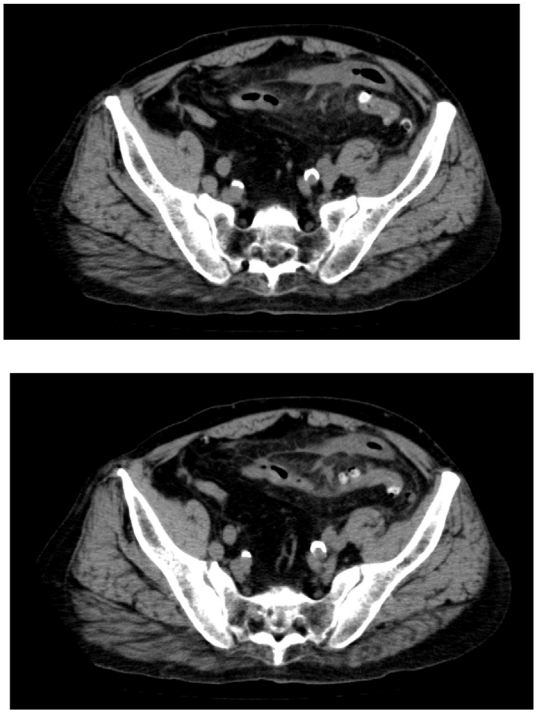

Fig. 1. Computed tomography revealed ascites, free air in the abdominal cavity, multiple diverticula of the sigmoid colon, as well as increased fat tissue surrounding the sigmoid colon.

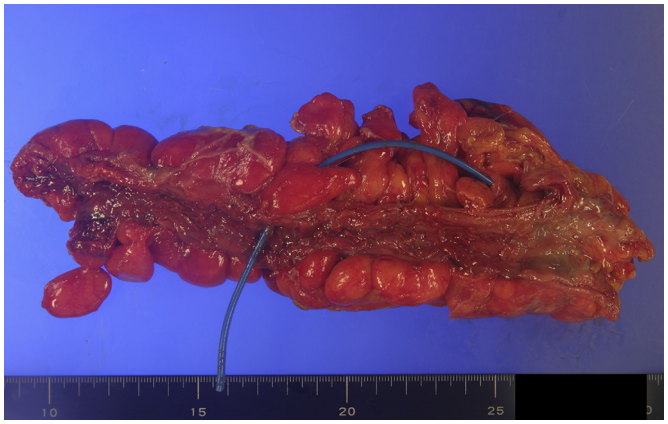

Fig. 2. Resected specimen revealed a 5 × 5 mm perforation in the sigmoid colon.

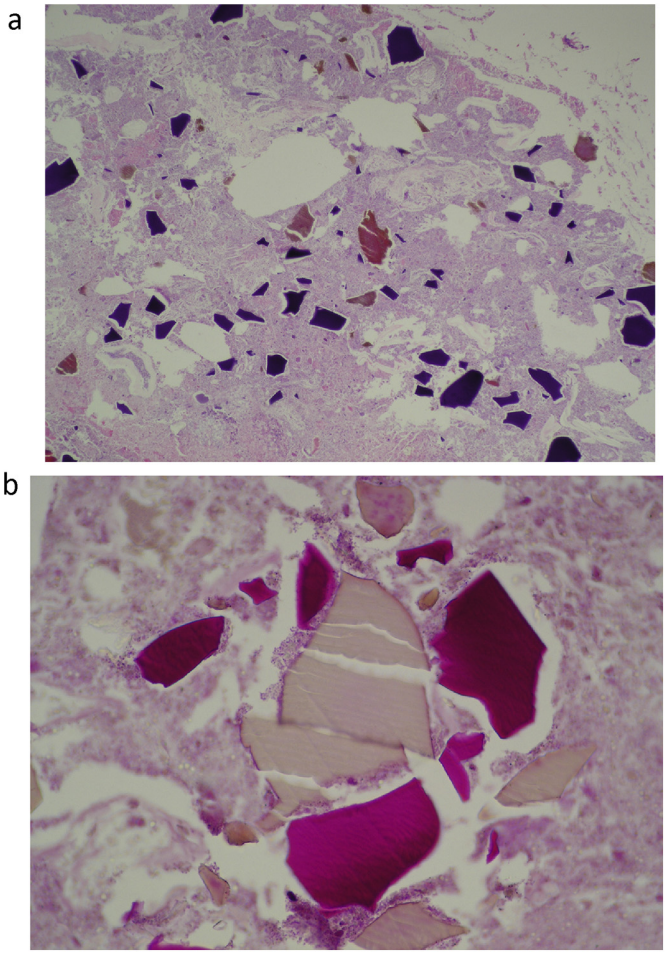

Fig. 3. 3a Histopathology of the perforated colon revealed sevelamer crystals displayed as broad, curved, and irregularly spaced "fish scales" with a characteristic two-toned color, imparted by bright pink linear accentuations with a rusty yellow background. Violet Kayexalate crystals were seen on hematoxylin and eosin staining. **3b** On Periodic acid–Schiff staining sevelamer crystals maintain their internal "fish scale" appearance with violet color, as opposed to Kayexalate crystals, which were negative. (For interpretation of the references to color in this figure legend, the reader is referred to the web version of this article.)