

Chronic renal failure, hyperkalemia, and colonic ulcers

S. A. George, Alboraie M.^{1,2}, A. Maamoun

Departments of Histopathology and ¹Internal Medicine, Haya Al-Habeeb Gastroenterology Center, Mubarak Al Kabir Hospital, Jabriya, Kuwait, ²Department of Internal Medicine, Al-Azhar University, Cairo, Egypt

A 72-year-old male on regular hemodialysis presented to the emergency department with complaints of fatigue and watery diarrhea for 3 days. On examination, he was hypotensive. His medical history was significant for hypertension, chronic kidney disease, and was on regular hemodialysis. Investigations showed hyperkalemia (5.60 mEq/L). He was diagnosed to have acute on chronic kidney injury secondary to hypovolemia. He was treated with intravenous fluids, calcium resonium enema, and antihypertensives. Two days later, the patient had abdominal pain and bleeding per rectum. Diagnostic colonoscopy showed multiple colonic ulcers involving rectum to transverse colon [Figure 1]. The differential diagnoses included infectious and ischemic colitis. Colonic biopsies showed active colitis with mucosal ulceration. In addition, angulated purplish crystals with fish scale appearance were present on the mucosa, within the ulcer and inflammatory debris [Figures 2 and 3]. A diagnosis of calcium polystyrene sulfonate (CPS) induced colonic ulcers was made.

Sodium or calcium polystyrene sulfonate (Kayexalate/SPS or analog) is an ion-exchange resin commonly used to treat hyperkalemia. Colonic necrosis and perforation are rare, but may occur as severe complications associated with these drugs.^[1-3] The actual incidence of gastrointestinal complications following SPS/CPS use is unknown, but is higher in patients with uremia and in posttransplant patients. Kayexalate induced colonic necrosis is usually

diagnosed one to several days after administration, commonly occurs in the lower gastrointestinal tract but has been reported to occur in esophagus, stomach, and duodenum. The mechanism of the necrosis and perforation is unknown. Sorbitol is believed to be the toxic agent on the gastrointestinal mucosa.^[2] However, use of kayexalate without sorbitol and CPS administered as suspension in distilled water has also been documented to cause the same complications. Hypovolemia, hyperreninemia, elevated prostaglandin production, and localized colonic mesenteric vasospasm are other possible

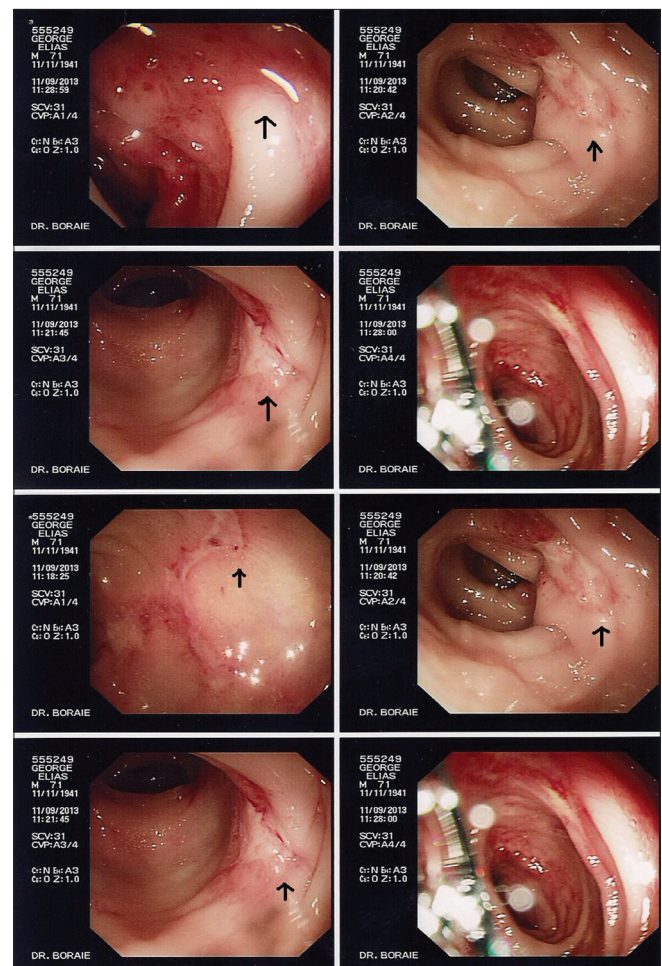


Figure 1: Colonoscopy revealing mucosal ulcers (arrows) from rectum to transverse colon

Address for correspondence:

Dr. Smiley Annie George, Department of Histopathology, Mubarak Al Kabir Hospital, Jabriya - 43787, 32052, Kuwait. E-mail: annsmiley78@gmail.com

Access this article online	
Quick Response Code:	Website: www.indianjnephrol.org
	DOI: 10.4103/0971-4065.132023

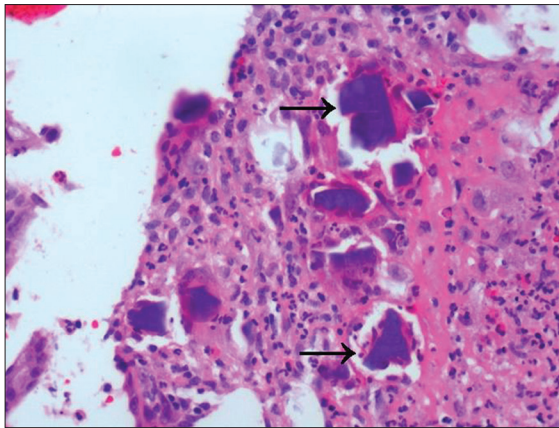


Figure 2: Purplish angulated crystals (arrows) within the colonic ulcers (H and E, ×400)

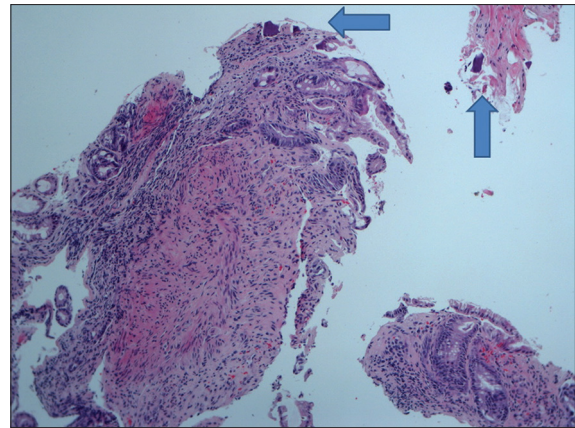


Figure 3: Colonic mucosa with ulceration and purplish crystals (arrows) on the surface (H and E, ×200)

explanations. Ischemic colitis, infectious colitis, and pseudomembranous colitis are the main differential diagnoses. The finding of characteristic angulated purplish crystals with fish scale appearance in the biopsy samples remain the main clue in the diagnosis of SPS/CPS induced colonic necrosis. These crystals are PAS positive and stain with acid-fast stains.^[1,3] Histologically, SPS/CPS crystals should be differentiated from crystals of cholestyramine; the latter are more basophilic, rhomboid in shape, and opaque without a mosaic pattern. Clinicians need to be aware of these rare complications of potassium exchange resins.

References

1. Akagun T, Yazici H, Gulluoglu MG, Yegen G, Turkmen A. Colonic necrosis and perforation due to calcium polystyrene sulfonate in a uremic patient: A case report. *NDT Plus* 2011;4:402-3.
2. Lillemoen KD, Romolo JL, Hamilton SR, Pennington LR, Burdick JF, Williams GM. Intestinal necrosis due to sodium polystyrene (Kayexalate) in sorbitol enemas: Clinical and experimental support for the hypothesis. *Surgery* 1987;101:267-72.
3. Joo M, Bae WK, Kim NH, Han SR. Colonic mucosal necrosis following administration of calcium polystyrene sulfonate (Kalimate) in a uremic patient. *J Korean Med Sci* 2009;24:1207-11.

How to cite this article: George SA, Alborae M, Maamoun A. Chronic renal failure, hyperkalemia, and colonic ulcers. *Indian J Nephrol* 2014;24:193-4.

Source of Support: Nil, **Conflict of Interest:** None declared.

Announcement

iPhone App



Download
Android
application

FREE

A free application to browse and search the journal's content is now available for iPhone/iPad. The application provides "Table of Contents" of the latest issues, which are stored on the device for future offline browsing. Internet connection is required to access the back issues and search facility. The application is Compatible with iPhone, iPod touch, and iPad and Requires iOS 3.1 or later. The application can be downloaded from <http://itunes.apple.com/us/app/medknow-journals/id458064375?ls=1&mt=8>. For suggestions and comments do write back to us.