Case Report

Foreign Body Granuloma Induced by Submucosal Lifting Agent Mimicking Adenoma or Colorectal Carcinoma

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Foreign bodies used during surgeries and endoscopy procedures may elicit inflammatory reactions and granuloma formation. The resultant lesion may mimic polyps or tumors, which require cautious interpretation. Here we reported that 69-year-old patient with history of treated rectal cancer underwent surveillance colonoscopy where a tubular adenoma was found in the cecum. A follow-up endoscopy found a flat polyp at the ileocecal valve. Right hemicolectomy was performed. On examining the specimen, two lesions were identified in the wall of the ileocecal valve area. Microscopically, there were foreign body giant cell granulomas filled with eosinophilic amorphous material which is consistent with an inflammatory reaction caused by submucosal lifting material injection used during colonoscopy for polypectomy. The granulomas mimicked recurrence of colorectal carcinoma. Therefore, surgeons and pathologists should be aware of the inflammatory reaction elicited by the new lifting agents that may resemble polyps or tumors.
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Key Words: *foreign body granuloma, submucosal lifting material, colon polyp, colorectal carcinoma*

INTRODUCTION

Foreign body giant cell granulomas are not frequently found in the colon. Several substances have been shown to elicit inflammatory and foreign body giant cell reaction. Some of these substances may be introduced during surgery such as gauze, suture material, or hemostatic agents such as oxidized cellulose (SurgicelTM)[1] or during colonoscopic polypectomy procedures such as submucosal lifting agents.[2,3] Other possible cause for such reaction is pulse granuloma which is caused by foreign body or food and has been previously reported in gastrointestinal tract, mouth, and lung.[4] The granulomatous foreign body reaction elicited by these foreign substances may cause elevated lesions that can mimic polyp on endoscopy and prompt aggressive un-necessary interventions. We report a case of foreign body giant cell granuloma that mimicked an advanced adenoma in a high-risk patient.

CASE REPORT

The patient is a 69-year-old white male who had a medical history of poorly-differentiated rectal adenocarcinoma with pathological stage pT3N0M0. He was treated with neoadjuvant concomitant chemoradiation with Capecitabine followed by laparoscopic low anterior resection and 12 cycles of modified FOLFOX-6 adjuvant chemotherapy that was completed 12 years ago. Recently, the patient had a routine surveillance colonoscopy that showed a sessile polyp in the cecum at the ileocecal valve. The polyp was biopsied with cold biopsy forceps and was diagnosed as tubular adenoma after histological examination. Given the difficult location of the polyp, follow-up colonoscopy was done 2 weeks later by the advanced GI team later with the plan to completely resect the polyp. At that procedure, a 10 mm flat polyp was identified extending into the ileocecal valve (**Figure 1A**). Attempted complete resection of the polyp was unsuccessful due to inadequate bowel preparation, poor endoscopic visualization and extension into the ileocecal valve. Lift was attempted using ORISETM Gel (Boston Scientific). The polyp was biopsied and pathological examination showed prominent submucosal adipose tissue.

Given the patient's history of rectal cancer and inability to completely remove the polyp endoscopically, the decision was made to move forward with formal surgical resection. A robotic assisted laparoscopic right hemicolectomy with primary anastomosis and umbilical hernia repair was done 2 months later. The specimen was sent to pathology for diagnosis. Two firm pale-yellow poorly delineated lesions in the wall of the ileocecal valve were identified 1.8 cm apart from each other measuring 2.5 x 1.8 x 1.3 cm and 1.8 x 0.8 x 0.6 cm (**Figure 1B**). The rest of the colonic mucosa was tan with normal appearing mucosal folds. Seventeen lymph nodes were identified in the mesenteric fat. There was no grossly identifiable lesion within the omentum.

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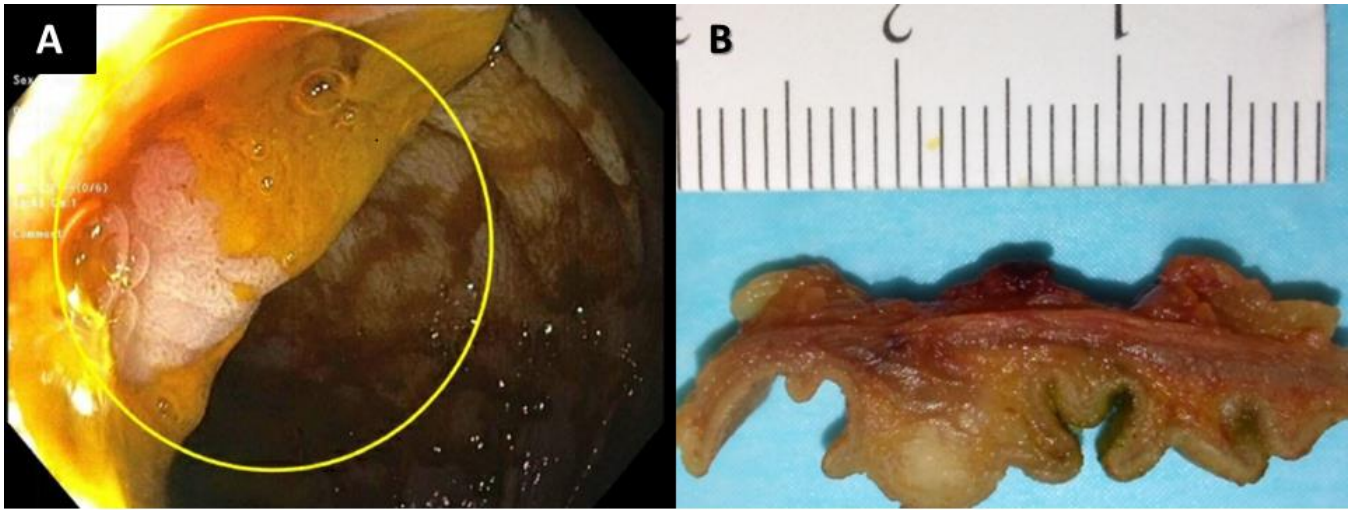

Figure 1. A: The 10 mm flat polyp located at the ileocecal valve as it was seen during colonoscopy; **B:** Gross picture of the lesion after resection of the right colon.

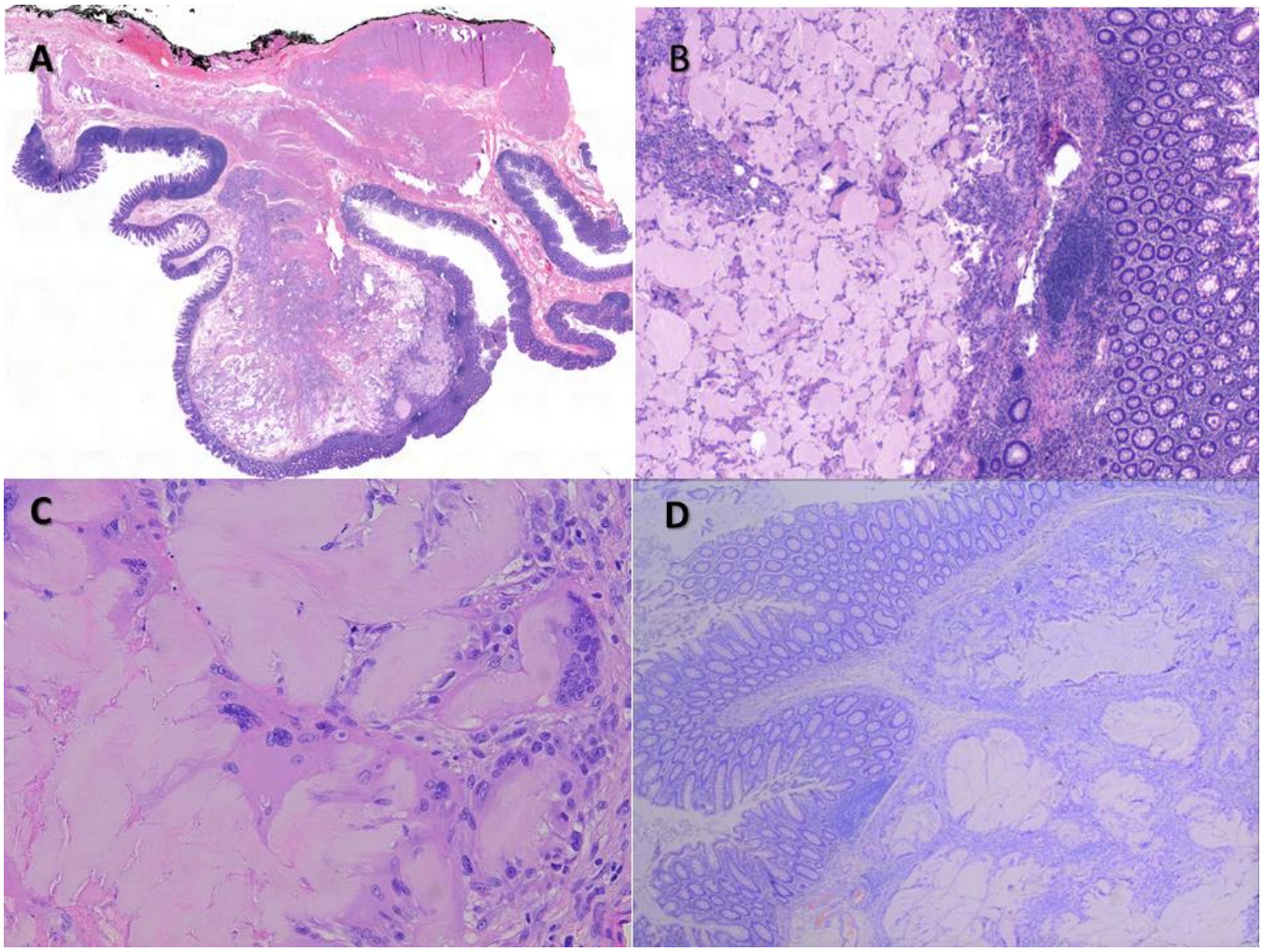

Figure 2. A: Low magnification microscopic picture of the polyp showing the spaces in the submucosa filled with eosinophilic material raising the surface mucosa forming polyp-like lesion; **B** & **C:** Higher magnification of the lesion showing the eosinophilic material surrounded by multinucleated giant cells; **D:** The eosinophilic amorphous material is negative for the Congo red.

Microscopically, the ileocecal wall lesions demonstrated multiple irregular spaces filled with amyloid-like material surrounded by foreign body giant cells forming two granulomas in the submucosa (**Figure 2A-2C**). Congo red staining was negative (**Figure 2D**), while amyloid A and P immunostains were non-contributory due to strong background staining. There was no evidence of doubly refraction material with polarized light. No amyloid-like material deposition was found in surrounding vessels. The remainder of the colon was free of adenoma or malignancy and had no significant pathological changes. Seventeen mesenteric lymph nodes were unremarkable and negative for malignancy. The patient's postoperative course was complicated by frequent episodes of diarrhea in addition to nausea. Clostridium Difficile test was negative and the diarrhea resolved spontaneously. Otherwise, the patient did well and was discharged in a stable condition to home on day 7 post-operatively.

DISCUSSION

Foreign body granulomas can be caused by a number of materials that are frequently used during surgeries and endoscopic procedures. Among these materials, the submucosal lifting agents are frequently injected during endoscopy to form a cushion underneath the mucosal lesion for better visualization of the lesion and to facilitate the resection.[5] Several recently published papers characterized the gross and microscopic pictures of some of the newly introduced submucosal lifting agents such as ORISETM (Boston Scientific, 300 Boston Scientific Way, Marlborough, MA 01752-1234, USA) and EleviewTM (SIC-8000, Aries Pharmaceutical Inc, San Diego, Calif, USA).[2,3,6,7] It has been reported that immediately after injection, the lifting agent material may have similar appearance to acellular mucin and may stain positive for mucicarmine.[8] In weeks after injection, the lifting agent deposits may persist at injection site eliciting an inflammatory response in the surrounding tissue, which can produce a gross impression of more advanced lesion such as polyps or tumors. A few case reports have described these mases.[9,10] With the histological examination, amyloid-like material is commonly present with multinucleated giant cells. The amyloid-like material in our case is negative for Congo-Red stain. In contrast to the amyloid-like material caused by the submucosal lifting agents, the real amyloid lesion can be distinguished by its pattern of deposition within vessel walls. In addition, no foreign body giant cell reaction is present surrounding the amyloid. Congo-Red stain can confirm the real amyloid change. The amyloid-like material is negative for Congo-Red stain.[7]

In our case, the patient had a flat polyp on colonoscopy weeks after a diagnosis of tubular adenoma was made. This finding prompted the decision for right hemicolectomy. The microscopic picture of this polyp showed un-resorbed amorphous eosinophilic material with associated multinucleated giant cells and a mixed inflammatory infiltrate consistent with the described lesion resulting from lifting material injection.[3,6,7] A similar case was described by Ibarra-Arzamendia et al.[6] A 73-year-old male underwent a laparoscopic-assisted hemicolectomy for a large sessile polyp of the ascending colon, which was reported as a deposition of dense eosinophilic material with a waxy amyloid-like appearance, consistent with ORISE injection.[6] In our case, the patient's history of rectal adenocarcinoma and the inability to completely resect the ileocecal polyp by endoscopy led to the decision to perform a hemicolectomy. Pathologists and surgeons should be aware of the appearance of lifting agent's granuloma mimicking adenoma or carcinoma in order to avoid confusion and unnecessary invasive interventions.

CONFLICT OF INTEREST

All authors do not have Conflicts of Interest and Financial Disclosures.

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