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## Case report of surgical management of a locally invasive colostomy adenocarcinoma

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## ABSTRACT

**INTRODUCTION:** This case report involves the presentation and management of a locally invasive adenocarcinoma at the site of a colostomy in a patient with multiple comorbidities and anatomic constraints. **PRESENTATION OF CASE:** 63 year-old woman with a complicated medical and surgical history, including imperforate anus and permanent colostomy, who presented with a fungating mass at the site of her colostomy. Evaluation revealed a locally invasive adenocarcinoma requiring surgical management for symptom control and oncologic treatment.

**DISCUSSION:** Due to the patient's medical comorbidities, body habitus, prior surgery, prior radiation and locally invasive cancer, there were numerous physiologic and anatomic issues that required a multi-disciplinary approach. Specifically, consideration of the patient's prior radiation to the left chest, history of cystectomy and ileal conduit, history of prior colon resection, as well as her short stature and severe kyphosis required input from urology, plastic surgery and colorectal surgery for operative planning. The patient's chronic renal insufficiency, recurrent urinary tract infections and history of thromboembolic disease further complicated her perioperative management. Oncologic resection with wide local excision at the skin and abdominal wall were performed with mass closure of the midline and peristomal abdominoplasty, using mesh underlay. The patient's postoperative course was complicated by gastric outlet obstruction and recurrent urosepsis.

**CONCLUSIONS:** Patients with chronic colostomies require colon cancer screening similar to their non-stoma peers, in accordance with national guidelines. Oncologic resection of cancers involving colostomies is feasible, but may require multi-disciplinary planning to manage complicated anatomic concerns.

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## 1. Introduction

Colostomies are commonly created to treat congenital anatomic anomalies, rectal cancer, diverticulitis, Crohn's disease and other causes of large bowel obstruction [1]. Overall, about 100,000 patients require a colostomy or ileostomy each year in the U.S [2]. Colorectal cancer affects approximately 150,000 people in the U.S. each year, ranking 3rd in incidence of all cancers [3]. Patients who have required colostomy in the past may be at higher risk for future colon cancer due to their prior disease (i.e., rectal cancer, colitis) [4,5]. Despite the high incidence of colorectal cancer and a high prevalence of colostomates, the presentation of a malignant lesion involving a colostomy is rare and has not been reported in the literature to date. Here, we present the case of a patient with a history of imperforate anus and colostomy since infancy, who developed

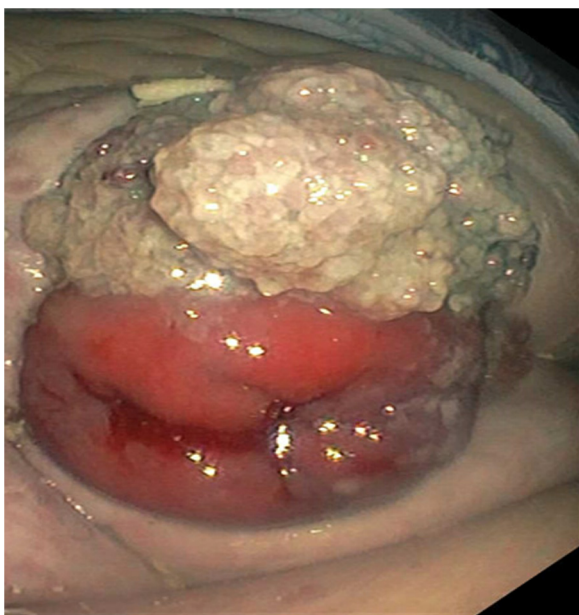
an adenocarcinoma of her colostomy. This work has been reported in line with the SCARE criteria [6].

## 2. Case presentation

The patient is a 63 year-old woman with a complicated medical history, including imperforate anus, bladder exstrophy, short stature, spina bifida with severe kyphosis of her lumbosacral spine, chronic renal insufficiency, nephrolithiasis, recurrent urinary tract infections, cancer of the left breast requiring multiple lumpectomies and radiation therapy, venous thromboembolic disease, anxiety and depression. As treatment for her congenital genitourinary malformations she had bladder excision with urostomy, proctectomy with colostomy and labial reconstruction during childhood. Later in childhood she required a gastrostomy tube and further colectomy for unknown reasons. Of note, she denied ever having issues with her colostomy throughout adulthood and never had a screening colonoscopy. The patient presented with a 6-month history of crampy abdominal pain, pain around her stoma, bloating,

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**Fig. 1.** Fungating mass of colostomy. Gross appearance of colostomy mass at time of biopsy. Initial biopsies revealed tubulo-villous adenoma with foci of high-grade dysplasia but were equivocal for invasive carcinoma.

and diarrhea alternating with reduced stoma output. She denied seeing blood in the stool but had recently noticed bleeding from the ostomy site when changing appliances. Her review of systems was otherwise negative. On examination, the patient appeared generally well, her abdomen was soft without distension or tenderness and she had a normal-appearing right-sided urostomy. On her left abdomen, her colostomy was noted to have a tender, fungating mass involving more than 50% of its circumference (Fig. 1). She had well-healed scars in the midline and suprapubic region from prior surgery and no palpable hernias.

The patient was taken to the operating room for an exam under anesthesia and biopsy. The mass was found to be fixed and locally infiltrating. Digital exam of the colostomy revealed tight stenosis, and although attempts at dilation were performed, colonoscopy was not possible even with a 9 mm endoscope. Biopsies revealed tubulo-villous adenoma with foci of high-grade dysplasia. CT scan of the abdomen and pelvis detected soft issue fullness along

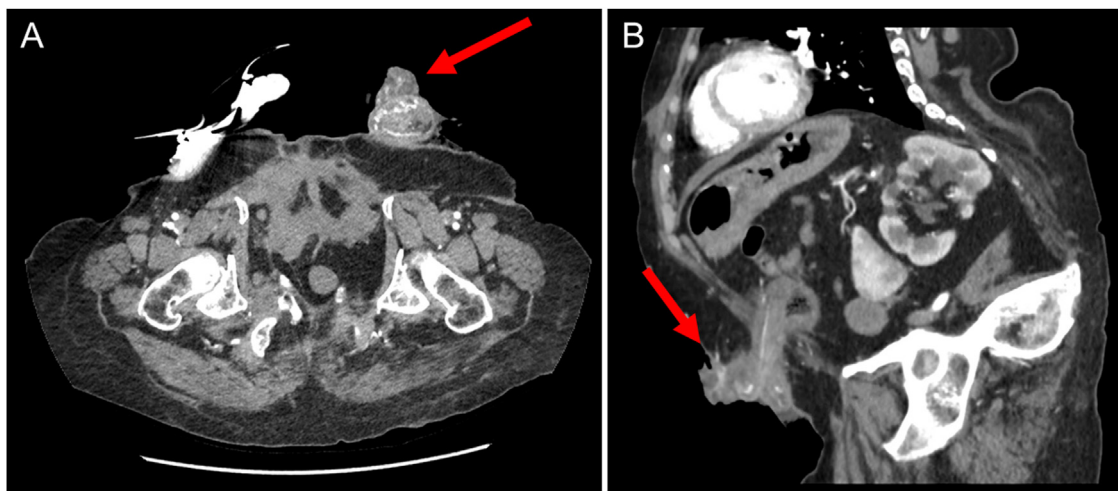
the anterior intra-abdominal margin of the colostomy and mild colon wall thickening, but no evidence of nodal enlargement or metastatic disease (Fig. 2). She underwent local excision of the mass to achieve debulking and provide more tissue for diagnosis. Pathology from this procedure revealed villous, mucinous and intestinal type neoplasm with areas concerning for superficial invasive adenocarcinoma.

A multi-disciplinary approach was initiated with consultation of specialists in Nephrology, Hematology-Oncology, Infectious Disease, Urology, Plastic Surgery, and Radiation Oncology. The recommendation was oncologic colectomy with attention to R0 excision, end ileostomy and abdominal wall reconstruction. Specific issues of concern included the patient's short stature and kyphosis, prior incision sites and urostomy location, prior left chest irradiation and the expected sizable defect at the colostomy site (Figs. 3 and 4).

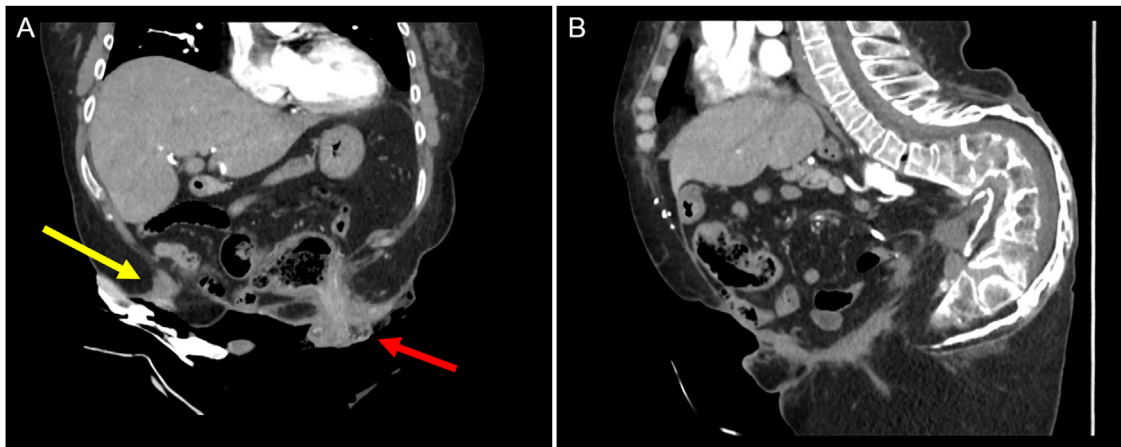
The procedure included extensive lysis of adhesions, oncologic completion colectomy of the remaining colon with R0 resection at the fascia, muscle and skin levels, partial gastrectomy, small bowel resection and end ileostomy. Frozen sections from all quadrants around the colostomy excision site were negative for malignancy. Partial gastrectomy was needed to address a portion of stomach attached to the abdominal wall from the prior gastrostomy and small bowel resection was required to address an iatrogenic enterotomy during adhesiolysis. The end ileostomy was eviscerated through the prior colostomy defect. The midline and parastomal defects were closed with the assistance of the plastic surgery team. For the midline, a mass closure technique using interrupted #2 Ethilon Suture™ with bolsters placed approximately every centimeter as retention sutures was used. The peristomal fascial defect was repaired using a key-holed Veritas™ mesh as an underlay and #1 Prolene Suture™ for the fascia. The parastomal skin was approximated around the ileostomy using 4-0 Ethilon Suture™ in a vertical mattress. A Brooke ileostomy was created using 3-0 Ethicon Chromic Suture™ (Fig. 5).

Final pathology revealed a 6 cm moderately differentiated adenocarcinoma invading through the muscularis propria, with no evidence of lymphovascular or perineural invasion. All margins were negative and 15 lymph nodes harvested revealed no evidence of malignancy, with final staging a T3N0, stage II colon cancer.

The patient had a complicated postoperative course with respiratory failure, acute on chronic renal insufficiency, gastric outlet obstruction, prolonged parenteral nutrition requirements, and generalized deconditioning and debility. In addition, she required



**Fig. 2.** Computed tomography (CT) image of abdomen and pelvis with fungating mass involving colostomy. Axial (A) and sagittal (B) images of suspected colonic malignancy at left lower quadrant colostomy. Red arrows indicate the fungating mass at the colostomy site.



**Fig. 3.** Complex anatomy on CT. This patient had a history of multiple congenital abnormalities (imperforate anus, bladder exstrophy and spina bifida) requiring numerous abdominal and pelvic procedures during childhood. Demonstrated on coronal imaging (A) is the patient's short stature (127 cm), urostomy site (yellow arrow) and colostomy with fungating mass (red arrow). Her severe lumbosacral kyphosis is better appreciated on sagittal imaging (B).

treatment for chronic deep venous thrombosis and chronic *E. coli* urinary tract infections. She was discharged home after 30 days with home healthcare assistance, but was readmitted several times over the next few months for issues related to gastric outlet obstruction, urosepsis and renal insufficiency. At 90 days post-operative, the patient was tolerating a general diet with appropriate ileostomy function. Her abdominal incisions had healed without issues. At approximately 7 months post-operative, the patient underwent cystoscopy and ureteroscopy for recurrent urosepsis related to nephrolithiasis, she unfortunately expired from sepsis after that procedure.

### 3. Discussion

Colorectal cancer is the third most common cancer among in the U.S. In 2019, there were an estimated 101,420 new diagnoses of colon cancer and 44,180 diagnoses of rectal cancer [3]. Life-time risk of colorectal cancer is approximately 4.4% for men and 4.1% for women. Specific factors known to increase one's risk for colorectal cancer include advanced age, smoking, high alcohol consumption, a diet high in red meats, obesity, and physical inactivity [7,8]. Our patient's risk factors included her age, history of prior malignancy and radiation therapy.

The United States Preventive Services Task Force (USPSTF) currently recommends colorectal cancer screening for all patients between the ages of 50 and 75 (grade A evidence), with numerous colorectal cancer screening modalities approved (i.e., colonoscopy, virtual colonography, fecal testing). High-risk populations, including patients with a history of inflammatory bowel disease, hereditary polyposis syndromes, or a positive family history are recommended to undergo screening more often [9]. Despite a high prevalence of patients with colostomies, there is limited data regarding colorectal cancer screening in this subgroup. Over 750,000 Americans have ostomies and an estimated 130,000 individuals undergo new ostomy formation each year. A significant portion of these patients required colostomies for advanced inflammatory bowel disease or colorectal cancer, both risk factors for future colorectal cancer [1,4]. It is plausible that physiological changes due to colostomy status, such as changes in microbiome or altered epithelial cell turn-over, may alter a patient's predisposition to colorectal cancer [10,11]. This is an area needing further study. The current case serves as a reminder that individuals living with colostomies should undergo colorectal cancer screening according to USPSTF guidelines. According to the National Cancer Institute colorectal risk assessment tool, our patient had a 4% lifetime risk



**Fig. 4.** Surface anatomy. Immediate preoperative image in the operating room with markings demonstrating the right and left costal margins and midline.

of colorectal cancer (<https://ccrisktool.cancer.gov/calculator.html>). Of note, radiation therapy for two prior breast cancers combined with her short stature and severe may have increased her risk of malignancy at the colostomy.

A significant issue requiring pre-operative planning was location for the planned ileostomy. Complicating factors included the patient's body habitus, prior midline and inferior abdominal surgical scars, history of radiation therapy to the left chest, presence of a urostomy, and need for wide local excision of her colostomy to achieve negative margins. Coordinating and planning with plastic and reconstructive surgery was essential.

Post-operatively, the patient's course was complicated by recurrent urosepsis as well as gastric outlet obstruction. She had chronic colonization of her urinary tract pre-operatively with ESBL-producing *E. coli* and was given ertapenem for perioperative prophylaxis. Despite this, recurrent urinary tract infections contributed to post-operative morbidity. Although pre-operatively she had a GFR of 45%, with a non-functional right kidney, she did not require hemodialysis post-operatively. Our surgery included a limited partial gastrectomy and the patient developed severe and persistent gastric outlet obstruction. This contributed to respira-

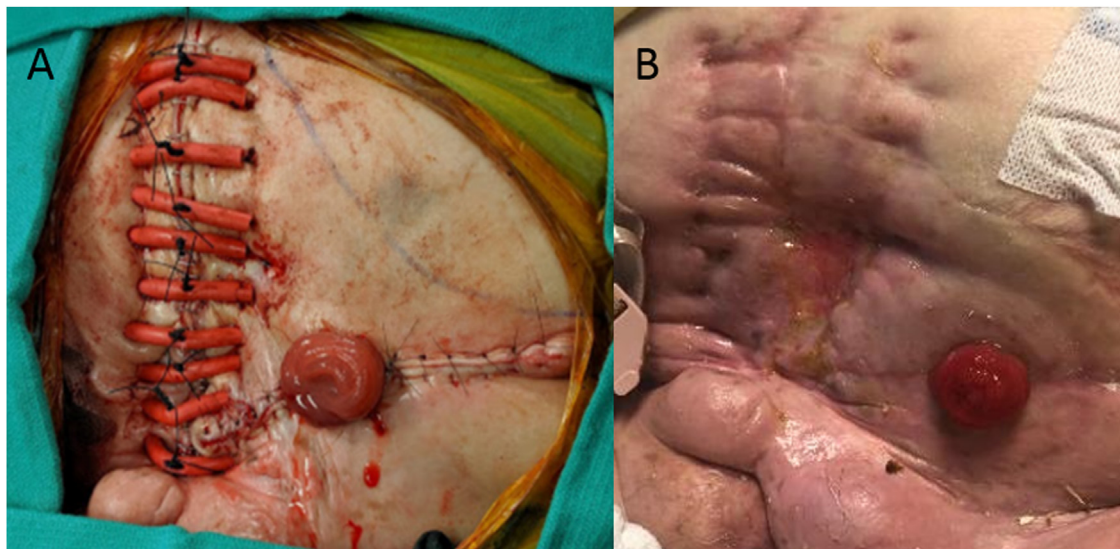


Fig. 5. Post-operative images. Immediate (A) and post-operative day 56 (B).

tory distress early in the post-operative period, and the need for prolonged gastric decompression and post-pyloric enteral nutrition via a percutaneous GJ tube. Retrospectively, consideration for intraoperative GJ tube placement may have been worthwhile.

Our patient's T3N0 stage IIA colon cancer typically has a favorable prognosis after R0 resection with an estimated 85% 5-year survival rate. [12] Current treatment guidelines suggest that with high-quality surgical resection adjuvant chemotherapy is not indicated for most patients in this subgroup. Post-resection surveillance is critical as disease recurrence for colorectal cancer occurs in as many as 40% of cases, most within the first 5-years [13]. Surveillance recommendations include interval office examination, cross-sectional imaging, colonoscopy, and carcinoembryonic antigen levels [13]. The presence of permanent colostomy should not alter these recommendations.

#### 4. Conclusions

This case report presents the work-up and management of a patient with an adenocarcinoma of her colostomy, which has not been previously reported in the literature. Patients with chronic colostomies require colon cancer screening similar to their non-stoma peers, in accordance with national guidelines. Oncologic resection of cancers involving colostomies is feasible, but may require multi-disciplinary planning to manage complicated anatomic concerns.

#### Declaration of Competing Interest

None.

#### Ethical approval

None. This is a retrospective case report.

#### Consent

Patient expired. Not able to obtain consent. Prior to surgery, patient did sign consent including, I acknowledge that the physician/surgeon may photograph, videotape or otherwise make recordings of me or my image before, during, or after this procedure for purposes related to care, treatment and/or medical education.

#### Registration of research studies

NA.

#### Guarantor

Seth Rosen, MD.  
Lindsay Pearson, PA-C.

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#### CRediT authorship contribution statement

**Lindsay Pearson:** Data curation, Writing - original draft. **Daniel M. Chopyk:** Writing - original draft. **Seth A. Rosen:** Conceptualization, Resources, Supervision, Writing - review & editing.

#### References

- [1] C. Taneja, D. Netsch, B.S. Rolstad, et al., Risk and economic burden of peristomal skin complications following ostomy surgery, *J. Wound Ostomy Continence Nurs.* (2019).
- [2] K.H. Sheetz, S.A. Waits, R.W. Krell, et al., Complication rates of ostomy surgery are high and vary significantly between hospitals, *Dis. Colon Rectum* 57 (2014) 632–637.
- [3] American Cancer Society, Key Statistics for Colorectal Cancer, Volume 2020, 2018.
- [4] W.T. Clarke, J.D. Feuerstein, Colorectal cancer surveillance in inflammatory bowel disease: practice guidelines and recent developments, *World J. Gastroenterol.* 25 (2019) 4148–4157.
- [5] L. Kong, J. Peng, J. Li, et al., Prolonged surveillance of colorectal cancer patients after curative surgeries beyond five years of follow-up, *Ann. Transl. Med.* 7 (2019) 608.
- [6] R.A. Agha, M.R. Borrelli, R. Farwana, et al., The SCARE 2018 statement: updating consensus surgical Case Report (SCARE) guidelines, *Int. J. Surg.* 60 (2018) 132–136.
- [7] R.L. Siegel, K.D. Miller, A. Goding Sauer, et al., Colorectal cancer statistics, 2020, *CA Cancer J. Clin.* (2020).
- [8] C. Mattiuzzi, F. Sanchis-Gomar, G. Lippi, Concise update on colorectal cancer epidemiology, *Ann. Transl. Med.* 7 (2019) 609.

- [9] R.A. Smith, K.S. Andrews, D. Brooks, et al., Cancer screening in the United States, 2019: a review of current American Cancer society guidelines and current issues in cancer screening, *CA Cancer J. Clin.* 69 (2019) 184–210.
- [10] M.A. Krezalek, K.B. Skowron, K.L. Guyton, et al., The intestinal microbiome and surgical disease, *Curr. Probl. Surg.* 53 (2016) 257–293.
- [11] A.L. Hartman, D.M. Lough, D.K. Barupal, et al., Human gut microbiome adopts an alternative state following small bowel transplantation, *Proc. Natl. Acad. Sci. U. S. A.* 106 (2009) 17187–17192.
- [12] J.B. O'Connell, M.A. Maggard, C.Y. Ko, Colon cancer survival rates with the new American Joint Committee on Cancer sixth edition staging, *J. Natl. Cancer Inst.* 96 (2004) 1420–1425.
- [13] C.J. Kahi, C.R. Boland, J.A. Dominitz, et al., Colonoscopy surveillance after colorectal Cancer resection: recommendations of the US multi-society task force on colorectal Cancer, *Am. J. Gastroenterol.* 111 (2016) 337–346, quiz 347.

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