

## Post Radiation Intestinal Dysfunction Care

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### Abstract

Radiation therapy treats many types of cancer even though its side effects are well documented and widely feared. The most common of which is injury to the gastrointestinal system. Improved treatment and screening have led to an increasing number of cancer survivors. 1.6 million people in the US currently live with post-radiation intestinal dysfunction [1]; causing increased medical costs while decreasing patient quality of life. Despite how ubiquitous the problem, there have been little advances to alleviate the seemingly inevitable side effects.

### Introduction

Our internal organs are either surrounded by or in close proximity to our intestines which are about 20 feet long, making them unavoidable in the abdomen. As an example, possibly the most feared location of a neoplasm is the head of the pancreas due to its late detection and poor surgical outcomes of the Whipple procedure; which involves removing a portion of the intestine along with the head of the pancreas due to its close proximity to the duodenum and part of the jejunum. For these reasons, radiation therapy always comes before surgery for pancreatic cancer and most cancers for that matter. Radiation treatment is meant to interrupt or stop the cell cycle, but it does so indiscriminately, making the cells of the intestines unavoidable collateral damage.

Current treatment for post-radiation intestinal dysfunction includes dietary modification, antidiarrheal agents, bile acid sequestrants, and antibiotics; though these treatments have a low success rate. In the following case we follow a woman with multiple comorbidities and an unconventional presentation who required surgical treatment for her post radiation intestinal dysfunction.

### Case

Ms. HH is a 79-year-old female with a 5-day history of nausea, vomiting and diarrhea leading to hypotension. The symptoms began spontaneously, and she is unable to keep any food down. Patient had history of carcinosarcoma variant of endometrial cancer for which she underwent a hysterectomy a few months prior. She was subsequently found to have some recurrence and had been on external beam radiation therapy after being on several rounds of chemotherapy. Only 16 of 33 radiation sessions had been performed until she could no longer continue due to the severity of the side effects. A CT (computed tomography) scan revealed dilated loops of small bowel with a caliber of 5 cm with distal wall collapse. Her last bowel movement or passing flatus was one day prior to admission.

- Past medical history includes hypertension, stress incontinence, urinary tract infection and uterine cancer.
- Past surgical history of tubal ligation and hysterectomy. Has been a half a pack a day smoker for the past 37 years.

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- Additional findings were hematuria and abdominal distention. Her hypotension led to acute kidney injury. Her blood urea nitrogen was 66, Creatinine 4.85, Potassium 3.3, and Anion gap of 16.
- A renal ultrasound showed echogenic kidneys bilaterally consistent with kidney disease, a simple right renal cyst, and three hypoechoic left renal lesions which represent complex cysts, the largest measuring 2.2cm.
- CT scan verified diffuse small bowel distention with influx into the esophagus and transition zone at the distal small bowel. Multifocal dense lesion at the left kidney and right pelviectasis or hydronephrosis with no obstructive uropathy.
- Assessment at this time by the attending radiologist was a small bowel obstruction secondary to early adhesions vs small bowel obstruction secondary to external beam radiation. Plan was to continue with nasogastric tube treatment, put on a nothing by mouth diet and monitor for improvement.
- There was no progress within the next 48 hours, so a small bowel series was performed which confirmed a distal small bowel obstruction
- After electrolytes were corrected and the patient stabilized she was taken into the operating room for laparoscopic lysis of adhesions and small bowel

enterotomy repair. Four Dressing Seprafilm Bio Reabsorbable Meshes were implanted on the small bowel to provide an adhesion barrier. The Seprafilm, comprised of two anionic polysaccharides: modified hyaluronic acid and carboxymethylcellulose, acts as a physical barrier preventing the formation of adhesions while the natural process of tissue wound healing takes place. Seprafilm turns into a gel within 24-48 hours after placement and stays in place for up to seven days, at which time it is resorbed and, by day 28, excreted from the body [2].

- Findings during the procedure: Grossly distended loops of bowel, extensive midline adhesions and a thin walled bowel diffusely. Along with dense adhesions in the terminal ileum.
- Months following the procedure Ms. HH has been seen in the outpatient setting multiple times with no sign of pre-operative symptoms returning. (Figure 1).

### Discussion

Anytime a new patient presents with any complications post-radiation therapy one has a preconceived diagnosis of radiation enteritis. But this diagnosis can be missed if the patient does not present with the expected symptom of diarrhea. Radiation therapy thins the bowel walls making them more vulnerable to outside forces such as adhesions. The most common causes of adhesions are prior abdominal

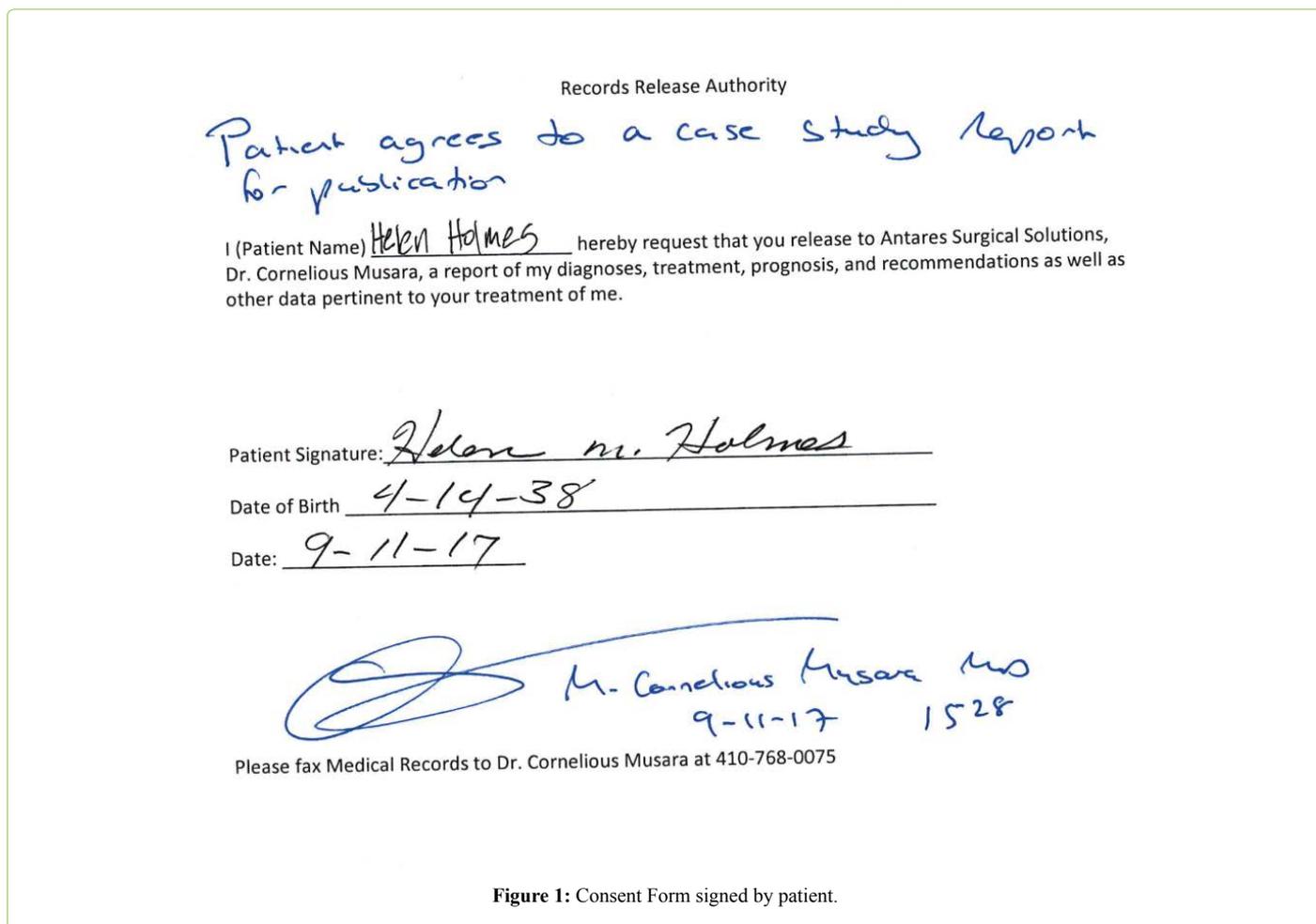


Figure 1: Consent Form signed by patient.

surgeries. The manipulation of internal organs from these previous surgeries cause bands of fibrous tissue to proliferate between the epithelial tissue of these organs. Though these bands usually remain asymptomatic, they are the most common cause of small bowel obstruction. This happens when the bands grow between two organs, they can press against the wall of the intestine. The lumen of the intestine is more likely to be compromised when the walls are thinner, as is the case with patients receiving radiation therapy.

Many radiation therapy patients are also suffering from multiple comorbidities, such as kidney function pathology in this patient. The symptoms from these comorbidities often mask the obvious diagnosis of small bowel obstruction secondary to adhesions, and therefore delaying treatment.

## Conclusion

Radiation has been a great tool in the fight against cancer, with the side effects being somewhat inevitable. As with

most pathologies, the greatest means to decrease incidence is early detection. Current literature shows diarrhea and vomiting to be the only gastrointestinal symptoms associated with radiation enteritis, though small bowel obstruction should be added as a later manifestation. The Seprafilm Bio Reabsorbable Mesh has proven to be a great aid in the recovery process and prevention of future adhesions. The use of this technology will likely be more widely used in various surgical and wound care settings. The use of the mesh could be implemented during any abdominal surgery to prevent future adhesion formation, since there have been no real side effects seen since their implementation, but so far they have only been used after adhesions have already formed. Long-term prophylactic studies of their use are warranted.

## References

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