

## Closed Loop Small Bowel Obstruction post Robotic Hysterectomy: A Case Report

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### Abstract

Robotic surgery has gone beyond the investigational stage and is currently used as the minimally invasive surgery of choice in different disciplines, particularly gynecological surgery. Robotic devices are continuously evolving and are expected to be widely disseminated as they become less expensive. As robotic surgery grows and disseminated, it is important to keep track of the true incidence of complications, whether related to the system itself or to the known traditional postoperative complication that usually occurs after traditional surgery or other minimally invasive modalities. Hence, transparency in reporting such complications is of utmost importance to ensure continued safe innovation and inform patients seeking surgical care. Herein, we report a case of closed loop small bowel obstruction one year post robotic hysterectomy done for a benign disease.

**Keywords:** Closed Loop, Robotic surgery, Hysterectomy

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### Introduction

In an era where minimally invasive surgery is the standard of care for a multitude of surgeries, robotic surgery has found its way and made tremendous progress in a relatively short period, with positive outcomes for patients and surgeons. This has translated directly to an increase in the use, development, and improvements in robotic devices and platforms. These developments tried to tackle the limitations of laparoscopic surgery regarding the surgeon's dexterity, sensory feedback, and

visualization. As gynecologic surgeons worldwide started to explore the utilization of laparoscopic techniques in gynecological surgery, the era of robotic surgery emerged and started to disseminate. In fact, Paraiso et al. concluded that robotic surgery gained relatively rapid acceptance in benign hysterectomy in recent years (1). Furthermore, Wright et al., in their paper published in 2013, reported a 1,000% rise in robotic hysterectomies between 2007 and 2010 (2). However, the increased use of robotic surgery in gynecology and other disciplines did not parallel the expected rise in reporting robotic

surgery complications. Having said this, reporting all complications, be it related to the device or the surgery, is of utmost importance as this will have a major impact on future development of guidelines for the use of robotic surgery. Herein, we report a case of closed loop small bowel obstruction one year post robotic hysterectomy done for a benign disease.

### Case Report

An 85-year-old woman known to have diabetes mellitus, hypertension, and coronary artery disease presented to our institute with the complaint of abdominal distention and decreased oral intake. Three days prior to presentation, the patient started to experience sudden-onset diffuse abdominal pain, non-radiating and crampy in nature. Pain was associated with a progressive increase in abdominal distention and decreased food and fluid intake. Furthermore, the patient reported an inability to pass any gas for two days and three episodes of biliary vomiting on the day of presentation. On presentation, the patient looked ill and was in pain. Vital signs were relatively stable except for tachycardia of 120 beats per minute; the blood pressure was 140/70 mmHg. Her abdominal exam revealed abdominal distention, negative bowel sounds, four quadrant tenderness, and rebound tenderness. Consequently, the blood work-up showed leukocytosis, with 32,000 white blood cells per microliter and a neutrophil shift of 81% neutrophils. The C-reactive protein level was elevated (38 mg/l), and the patient had acidosis with a bicarbonate level of 14 mEq/l. Consequently, a CT scan of the abdomen and pelvis was performed, showing a small amount of ascitic fluid (Figure 1), dilated small bowel loops with a transition zone, bowel thickening, and swirling of mesenteric vessels (Figure 2). In addition, multiple foci of intestinal pneumatosis were noted (Figure 3). These findings were consistent with closed loop bowel obstruction secondary to internal hernia with bowel compromise. Given the above, the patient was taken to the operating theater urgently for diagnostic laparoscopy and possible small bowel resection. In the operating theater, the diagnostic laparoscopy showed a moderate amount of free fluid in the abdominal cavity, which was suctioned. A closed loop small bowel obstruction of approximately 30 cm in length with bowel necrosis was noted. The closed loop obstruction was due to the omentum adhering to the pelvic inlet. Release of this adhesion was done, and severely inflamed mesentery of the involved bowel was noted. A Pfannenstiel incision was made with the insertion of an Alexis retractor; the involved bowel segment was exteriorized and resected at the site where there was no necrosis, and a side-to-side jejunojejunal anastomosis was done. This was followed by the closure of the mesenteric

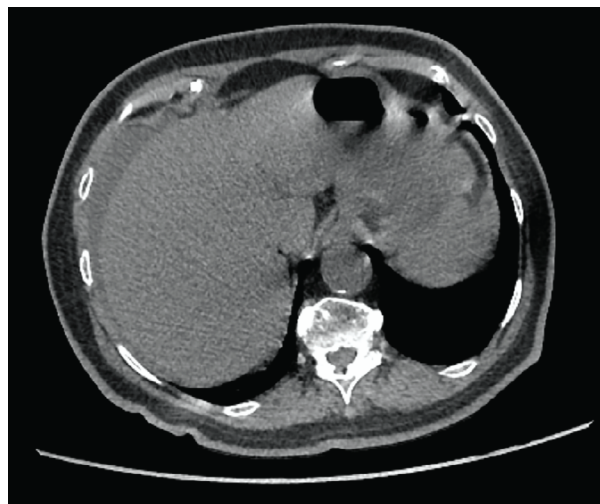


Figure 1: A small amount of ascitic fluid.

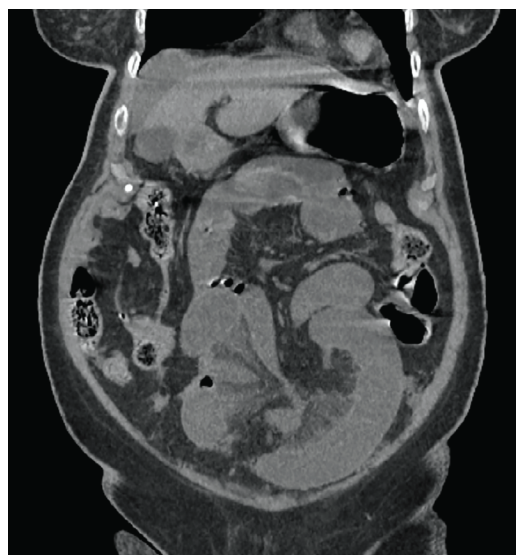


Figure 2: Dilated small bowel loops with a transition zone, bowel thickening, and swirling of mesenteric vessels.

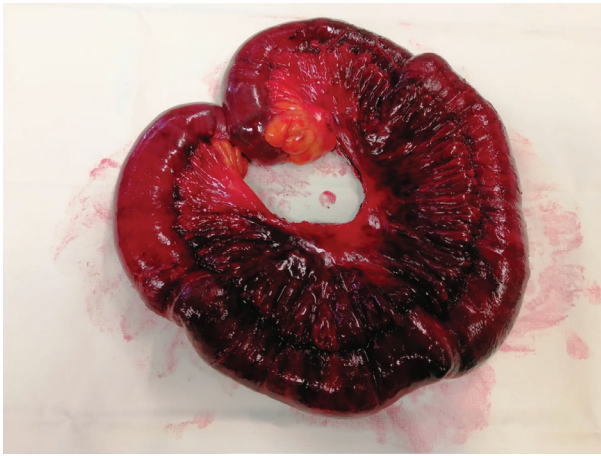


Figure 3: Intestinal pneumatosis.

defect. The resected specimen is shown in Figure 4. The postoperative course was smooth with no complications, and the patient was discharged to her home on the fourth day after surgery.

### Discussion

A minimally invasive hysterectomy approach offers



**Figure 4:** Resected specimen.

a faster patient recovery, a shorter hospital stay, and lower wound infection rates than the open approach (3). Both the American Congress of Obstetricians and Gynecologists and the American Association of Gynecologic Laparoscopists endorse a minimally invasive hysterectomy when applicable. With the increased use of robotic devices in surgeries and the related market expansion, the FDA continues to expand the indications of robotic surgeries. However, for a new device to be approved, one of the main factors is the device-related complications, with complications that are considered unrelated to the device not being considered. We believe that postoperative non-device-related complications after robotic surgery are under-reported, especially in gynecologic surgery. Although robotic surgery has shown promise in hysterectomy for both benign and malignant diseases, a more transparent reporting system should be available to document non-device-related complications.

Small bowel obstruction is considered a major surgical morbidity. In fact, there are 345,000 admissions annually related to small bowel obstruction, with a cost of 1.3 billion dollars (4, 5). 60 to 70 percent of cases are related to post-surgical adhesions (6). This is particularly relevant for major gynecologic surgery, as postoperative adhesions have been reported in up to 90% of cases (7). It is believed that the risk of small bowel obstruction is significantly higher after abdominal hysterectomy when compared with vaginal or minimally invasive hysterectomy (8). On the other hand, Sheyn et al. concluded that the

route of hysterectomy was not a significant risk factor for small bowel obstruction (9). This opens the door to the theory of under-reporting non-device-related surgical complications post robotic hysterectomy. In fact, data regarding postoperative surgical complications of robotic hysterectomy, mainly small bowel obstruction, is very limited. To the best of our knowledge, this is the first case of closed loop small bowel obstruction, complicated by bowel necrosis requiring small bowel resection post robotic hysterectomy. Our case highlights the importance of a minimally invasive approach to managing small bowel resection.

## Conclusion

Robotic surgery has found its way and made tremendous progress in a relatively short period, with positive outcomes for patients and surgeons. As it is being widely disseminated in different surgical specialties, it is important to document the true incidence of non-device-related complications. Transparency in reporting non-device-related complications is vital for educating patients seeking such a surgical option.

## Statement of Ethics

This research complied with the guidelines for human studies and was conducted ethically in accordance with the World Medical Association Declaration of Helsinki. Ethical approval was not required according to hospital guidelines. Written informed consent for publication was obtained from the patient to publish the case as well as all associated images.

## Author Contributions

All authors contributed equally to the writing and preparation of the article.

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**Conflicts of interest:** None declared.

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