GENERAL SURGERY

INDEX COPERNICUS INTERNATIONAL

ICV value for 2024 = 82.51

Case Report | International Journal of Medical Case Reports

Complications of Robotic Gastrointestinal Surgery : A Case Report of An Adhesive Small Bowel Obstruction.

Fakhiri Nassima[1], Mahad Abdillahi[2], Bukaka Christian[3], Kamal Khadidja[4], Ettaoussi Abdelhak[5], Majd Abdessamad[6], Bouali Mounir[7], Abdelilah Elbakouri[8], El hattabi Khalid[9].

[1-9] Department of General Surgery, Ibn Rochd University Hospital, Hassan II University, Faculty of Medicine and Pharmacy of Casablanca, Morocco

INTERNATIONAL JOURNAL OF MEDICAL CASE REPORTS ISSN 2455-0574

ABSTRACT

Background:

Robotic surgery is increasingly used in gastrointestinal surgical procedures for its precision, three-dimensional visualization and smaller incisions. However, postoperative complications can still occur including adhesive small bowel obstruction (ASBO). ASBO results from fibrous bands that kink or entrap bowel loops and its diagnosis is primarily clinical and supported by CT imaging. Although overall safety profiles approximate laparoscopy studies have documented postoperative complications after robotic surgery.

Case summary:

A 74-year-old man underwent robotic umbilical hernia repair with mesh. Four months later, he presented with cessation of stool, abdominal distension and bilious vomiting, with a distended, tympanic abdomen on examination and air–fluid levels on plain radiography. Contrast-enhanced CT demonstrated small-bowel distension with a transition point in the right iliac fossa. Intraoperatively the small bowel was dilated without any signs of ischemia and the obstruction was caused by a fibrous band between the small intestine and mesentery (small bowel–mesenteric adhesion). Adhesiolysis with division of the adhesive band was performed. Bowel transit resumed within 24 hours and the patient was discharged on postoperative day two and had an uneventful 6-week follow-up with return to normal activity.

Conclusion:

This case highlights ASBO as a potential delayed complication after minimally invasive robotic abdominal surgery even following seemingly straightforward procedures such as umbilical hernia repair with mesh. Early recognition with CT to localize the transition point and timely operative adhesiolysis can yield rapid recovery and excellent short-term outcomes. Vigilance for ASBO should be maintained in post-robotic surgery patients presenting with obstructive symptoms and clinicians should counsel patients regarding this risk despite the overall favorable safety profile of robotic techniques.

Keywords: Adhesions, Hernia, Intestinal Obstruction, Robotic Surgical Procedures, Surgical Mesh.

INTRODUCTION

Robotic surgery, introduced over the past two decades, has enabled the development of minimally invasive surgery[1]. It improves the precision and reliability of surgical procedures for the benefit of patient care.[2] It is mainly used for elective interventions.[3]

The expected benefits for patients are multiple and include reduction of the traumatic nature of procedures through smaller incisions, attenuation of pain and bleeding, reduction of infectious risk and overall complication rate. Nevertheless, certain mechanical complications, particularly small bowel obstruction due to adhesions have been observed in some cases.

International Journal Of Medical Case Reports (ISSN 2455-0574) is an indexed medical journal indexed in Index Copernicus

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Dr. Mahad Abdillahi

Department of General Surgery, Ibn Rochd University Hospital, Hassan II University, Faculty of Medicine and Pharmacy of Casablanca, Morocco email : madbokore@gmail.com

These are a type of mechanical obstruction caused by fibrous formations binding two loops together or attaching a loop or the omentum to a deperitonealized area thereby creating either a kink in the bowel or a window in which the intestine becomes trapped.[1]

Some factors appear to favor their occurrence, notably previous surgical, traumatic, or infectious history.[1] Diagnosis is essentially clinical and can be complemented by CT-scan.

The aim of our article is to demonstrate that robotic surgery, despite its precision and finesse, remains a surgical procedure with complications, just like any other surgical approach.

CASE REPORT

A 74-year-old patient operated on 4 months earlier for an umbilical hernia repair with mesh using robotic surgery, occasional alcohol user and chronic smoker (not weaned), presented with signs of bowel obstruction.

The clinical presentation included cessation of stool passage without cessation of gas, diffuse abdominal distension, and bilious vomiting, all evolving in a context of preserved general condition.Abdominal examination revealed a distended, tympanic abdomen. Rectal examination was normal. Plain abdominal radiography revealed air-fluid levels (Figure 1).

Figure 1:- Multiple Air-Fluid Levels on plain X-Ray Abdomen suggestive of Obstruction.

An abdominal CT scan was done which demonstrated small bowel distension with hydro-aeric levels, measuring up to 42 mm in diameter, upstream of a transitional point located in the right iliac fossa (Figure 2),.

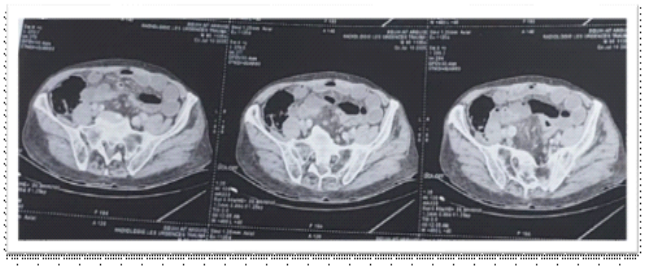

Figure 2:- Computed Tomography Abdomen showing small bowel distension with hydro-aeric levels s/o Obstruction.

Surgical exploration revealed dilatation of the small bowel measuring approximately 4 cm in diameter, with no evidence of ischemia. The obstruction was located proximal to a fibrous adhesion band extending between the small intestine and the mesentery (small bowel–mesenteric adhesion) (Figure 3).

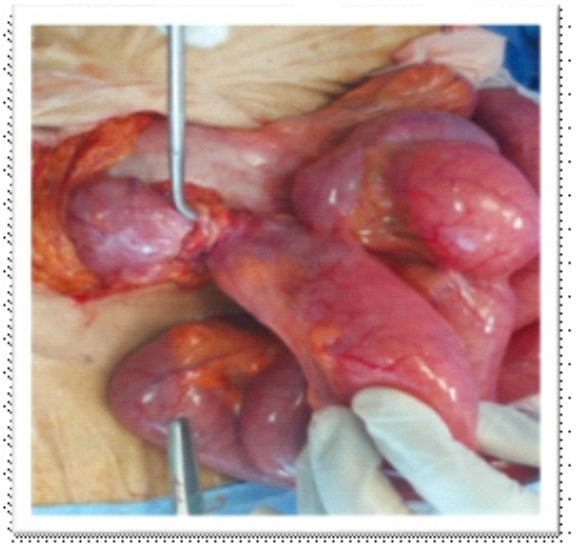

Figure 3:- small bowel–mesenteric adhesion see intra-operatively.

The surgical procedure involved adhesiolysis with division of the small bowel–mesenteric adhesion band. The postoperative course was uneventful, with restoration of bowel transit within 24 hours. The patient was discharged on the second postoperative day. At 6-week follow-up, wound healing was satisfactory, and the patient had resumed normal daily activities.

DISCUSSION

Robotic surgery, primarily used for minimally invasive laparoscopic procedures, provides visible advantages for patients, such as smaller scars. The absence of any significant external postoperative difference compared with conventional laparoscopy probably explains the numerous criticisms of robotic surgery, particularly with regard to its seemingly prohibitive cost.[4]

However, the robot mainly provides invisible advantages perceived by the surgeon, which seem obvious to them (quality of dissection and suturing, direct transfer of open surgery skills once the device is mastered, ability to perform complex procedures, absence of fatigue).

Although robotic surgery is widely used in general surgery, the analyzed studies highlight that despite these advantages, robotic surgery is not devoid of postoperative complications.

For example, a study conducted by Pooya Banapour et al in 2021 on 9,858 patients undergoing robotic surgery reported that 9.4% experienced surgical complications, including small bowel obstruction (19.4%).[5] In addition, other authors have reported postoperative obstructive syndromes following robotic surgery, such as Eric Tat Choi Lee et al who described bowel obstruction linked to the use of V-Loc sutures.[6]

Overall, abdominal robotic surgery demonstrates a

satisfactory safety profile, with complication rates similar to laparoscopy, though some procedure-specific risks have been identified when comparing robotic surgery directly with laparoscopy.

CONCLUSION

Robotic abdominal surgery has established itself as an innovative alternative to conventional laparoscopy and open surgery, offering improved surgical precision, three-dimensional visualization and superior ergonomics for the surgeon. However, the reviewed studies emphasize that this approach is not exempt from complications. The main postoperative complications include adhesive small bowel obstruction and trocar-site hernias. While the overall frequency of complications appears comparable to or sometimes lower than that of laparoscopy certain specific complications related to robotic surgery such as trocar-site hernias or conversion difficulties have been identified.

Source of funding: Nil

Conflict of interest: None

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Author Contribution:- FN, MA, BC, KK, EA: Conceptualized, supervised, revised, and edited the manuscript. MA, BM, AE, EH: Acquisition of data. Wrote the original draft, revised, and edited the manuscript.

Received : 10-07-2025 Revised: 15-08-2025 Accepted : 05-09-2025