

Laparoscopic Treatment of a Postoperative Small Bowel Obstruction

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ABSTRACT

We describe the case report of a 25-year-old female who presented with signs and symptoms of bowel obstruction status after laparoscopic treatment of an ectopic pregnancy performed 3 weeks earlier. The patient underwent laparoscopic lysis of adhesions and reduction of small bowel obstruction. This case report presents an atypical cause of postoperative bowel obstruction and reviews the current literature regarding laparoscopic surgery as an approach for treatment.

Key Words: Surgical clip, Bowel obstruction, Laparoscopic surgery, Case report, Postoperative complication, Transition point, Mesenteric ischemia.

CASE REPORT

A 25-year-old female had presented to the emergency department with 2 days of vomiting, mild right lower quadrant pain, and abdominal distention. The patient's past medical history was significant for a recent ectopic pregnancy for which she had undergone a laparoscopic salpingo-oophorectomy 3 weeks earlier. Upon admission, the patient had an elevated white blood cell count with left shift (12 000). An obstruction series (**Figure 1**) and CT scan were consistent with partial small bowel obstruction.

The patient was admitted to the hospital and observed overnight with a nasogastric tube, serial examinations, and IV fluid hydration. Her clinical picture worsened, and by the next morning it was decided to take her for exploration; a laparoscopic approach was selected.

The exploratory laparoscopy was performed with the patient under general anesthesia and by using three 5-mm ports. Upon entry into the abdomen, a fair amount of ascitic fluid was seen. Gentle "running of the small bowel" revealed an internal hernia in the right lower quadrant. Further inspection of site identified an adhesive band between the right fallopian tube and the mesentery of the small bowel, which had trapped a segment of the small bowel underneath (**Figure 2**). Prior to releasing the internal hernia, it was noted that a surgical clip from the cut end of the fallopian tube had "grabbed" the mesentery (**Figure 3**). The obstruction was reduced with gentle traction, and no signs of bowel compromise were noted. The clip was removed. A piece of Seprafilm was placed over the Fallopian tube, and the abdomen was desufflated and closed in the usual fashion.

The rest of the hospital course was benign. On postoperative day one, the nasogastric tube was discontinued, and patient was started on a clear liquid diet. The following day, the patient had a return of bowel function, advanced to a regular diet, and was ultimately discharged home (POD#2). At the subsequent outpatient follow-up visit, the patient was tolerating a regular diet without difficulty.

DISCUSSION

Small bowel obstruction is a common cause of surgical admissions from an emergency department. It has been

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Figure 1. Abdominal x-ray consistent with a partial small bowel obstruction.



Figure 2. Adhesive band in small bowel mesentery.

reported that up to 16% of all surgical admissions are due to bowel obstruction.¹ **Table 1** lists the most common causes of bowel obstruction.

Adhesions are the most common cause of bowel obstruction and are associated with prior laparotomy. **Table 2** lists the operative causes of adhesive band formation. Multiple adhesions are noted to occur more often with simple, nonstrangulated obstructions. In contrast, single-band adhesions are implicated more commonly in strangulated obstructions. Hernias account for 10% of small bowel obstructions and are more often associated with strangulation.²⁻⁴

One challenging question for a surgeon is when to oper-



Figure 3. Aberrant clip at transition point.

Table 1.
Causes of Small Bowel Obstruction²

Cause	Incidence
Adhesions	60%
Malignant Tumor	20%
Hernia	10%
Inflammatory Bowel Disease	5%
Volvulus	3%
Other	2%

Table 2.
Operative Causes of SBO³

Operation	Incidence
Appendectomy	23%
Colorectal resection	21%
Gynecological procedures	12%
Gastric, Splenic, Biliary procedures	9%
Small Bowel surgery	8%
Multiple laparotomies	24%

ate on a small bowel obstruction. Many debates and articles have addressed this issue. All agree that strangulation leading to ischemia, necrosis and ultimately perforation and sepsis is the most feared complication of small bowel obstruction. Although clinically there is no way to determine strangulation, suggestive signs and symptoms of

ischemia include continuous pain, fever, tachycardia, peritoneal irritation, leukocytosis, and metabolic acidosis.⁵ It is generally accepted that immediate operation is required with a complete bowel obstruction.⁶ For partial obstruction, signs of strangulation or ischemia merit an urgent laparotomy. However, once conservative management is decided on, close observation of the patient is warranted. Worsening of patient condition or failure of nasogastric tube treatment could lead to a change in treatment plan and operative intervention as a definitive treatment.

Another challenging question is the choice of surgical approach: laparoscopic versus open. Traditionally, an open procedure has been implemented, but now laparoscopy has been used with increasing popularity. General surgeons have realized that most (68%) laparoscopic procedures for small bowel obstruction succeed.⁷ Laparoscopy has many benefits over open laparotomy. These significant advantages are decreased: postoperative ileus, postoperative pain, estimated blood loss, length of hospital stay, surgical site infections, and fewer postoperative adhesions.^{7,9–11}

Many authors now advocate that all small bowel obstructions initially be approached laparoscopically—especially with its high success rate.^{2,4,6,7,9} This is further supported by the cause of small bowel obstruction.^{2–4} Often, the limiting factor in successfully performing laparoscopic treatment of small bowel obstruction is surgeon experience.^{2,4,6,7,9,12–14} There are additional factors that are important is selecting a patient population for the laparoscopic approach. First, a suspected proximal bowel obstruction would be favorable for laparoscopy; next would be an obstruction occurring with an anticipated single-band cause; third, there should be no signs of systemic sepsis and mild abdominal distention¹⁰; finally, appropriate “gentle” instruments should be used that allow manipulation of distended bowel.

Several situations could lead to a conversion to the open procedure. The most common is that of multiple dense adhesions associated with pelvic operations.⁹ These adhesions may obscure the point of obstruction. In addition, dense adhesions may also complicate access into the abdomen and result in the inability to acquire pneumoperitoneum.⁷ Also, inadvertent enterotomy during adhesiolysis where spillage of bowel contents is difficult to control and repair with laparoscopic instruments. As a final point, ischemic bowel would require resection and conversion to open laparotomy.⁷

Contraindications to laparoscopic small bowel obstruction

surgery include the traditional contraindications to any laparoscopic procedure: coagulopathy and inability to handle general anesthesia.¹⁰ Relative contraindications are dependent on surgeon skill. Severe abdominal distention (higher risk of iatrogenic bowel injury), generalized peritonitis (risk of perforated bowel), extremely dense adhesions (limiting field of view), and fused bowel loops (increased difficulty with laparoscopic lysis of adhesions) would suggest an open approach.^{7,10}

In this case report, the internal hernia resulted from an aberrant surgical clip. This is a very rare complication of a surgical stapler. Pub Med, MDConsult, and Ovid searches using the keywords “internal hernia,” “surgical clip,” or “bowel obstruction” yielded no articles that matched this topic. On the other hand, many reports of complications from deviant surgical clips exist; most common is gallstone formation around a clip resulting in choledocholithiasis.^{15–21} Some of the more unique tales of aberrant clips include an open staple resulting in bowel perforation after laparoscopic-assisted vaginal hysterectomy²²; a surgical clip found in duodenal ulcer bed status after laparoscopic cholecystectomy²³; a surgical clip with erosion through the esophagus²⁴; stone formation around a clip resulting in nephrolithiasis²⁵; expectoration of a clip after pneumonectomy²⁶; and a surgical clip protruding through the urethra after radical prostatectomy.²⁷ This case report of an internal hernia represents an inimitable tale in the ongoing history of aberrant surgical clips.

CONCLUSION

This is an example using patient history and combining the known cause of a pathological condition with the latest research on surgical technique to direct the decision-making process. The patient in this case study presented with bowel obstruction recently after a gynecologic laparoscopic procedure. Based on this history, it was suspected that a single-band adhesion was the likely cause of her small bowel obstruction. Ultimately, this guided the decision to choose laparoscopy as the definitive treatment in the patient with successful results.

References:

1. Maglinte D, Heitkamp DE, Howard TJ, Kelvin FM, Lappas JC. Current concepts in imaging of small bowel obstruction. *Radiol Clin North Am.* 2003;41:262–283.
2. Hayanga AJ, Bass-Wilkins K, Bulkley GB. Current management of bowel obstruction. *Adv Surg.* 2005; 39:1–33, 2005.
3. Cox MR, Gunn IF, Eastman MC, Hunt RF, Heinz AW. The

operative etiology and types of adhesions causing small bowel obstruction. *Aust N Z J Med* 1993;63:848–852.

4. Fevang B, Jensen D, Svanes K, Viste A. Early operation or conservative management of patients with small bowel obstruction? *Eur J Surg*. 2002;168(9):475–481.

5. Helton W, Fisichella P. Intestinal obstruction. In: Souba W, ed. *ACS Surgery Principals and Practice*. 6th ed. New York, NY: WebMD; 2007.

6. Chopra R, McVay C, Phillips E, Khalili TM. Laparoscopic lysis of adhesions. *Am Surg*. 2003;69(11):966–968.

7. Reissman P, Spira RM. Laparoscopy for adhesions. *Semin Laparosc Surg*. 2003;10(4):185–190.

8. Garrard C, Clements RH, Nanney L, Davidson JM, Richards WO. Adhesion formation is reduced after laparoscopic surgery. *Surg Endosc*. 1999;13:10–13.

9. Wullstein C, Gross E. Laparoscopic compared with conventional treatment of acute adhesive small bowel obstruction. *Br J Surg*. 2003;90(9):1147–1151.

10. Duh Q. Small bowel obstruction. *Endosurgery*. Tououli J, et al, eds. NY: Livingstone, 1996. 425–443.

11. Miller G, Boman J, Shrier I, Gordon PH. Etiology of small bowel obstruction. *Am J Surg* 2000;180:33–36.

12. Bailey IS, Rhodes M, O'Rourke N, Nathanson L, Fielding G. Laparoscopic management of acute small bowel obstruction. *Br J Surg*. 1998;85(1):84–87.

13. Franklin M, Dorman JP, Pharand D. Laparoscopic surgery in acute small bowel obstruction. *Surg Laparosc Endosc* 1994;4: 289–296.

14. Levard H, Boudet MJ, Msika S, et al. Laparoscopic treatment of acute small bowel obstruction: A multicentre retrospective study. *Aust N Z J Surg* 2001;71:6641–6646.

15. Oh HJ, Jung HJ, Chai JI, et al. A case of common bile stone developed due to a surgical clip as a nidus: an experience of successful management by endoscopy. *Korean J Gastroenterol*. 2003;42(4):351–353.

16. Herline A, Fisk JM, Debelak JP, Shull HJ Jr., Chapman WC.

Surgical clips: a cause of late recurrent gallstones. *Am Surg*. 1998;64(9):845–848.

17. Alsulaiman R, Barkun J, Barkun A. Surgical clip migration into common bile duct after orthotopic liver transplantation. *Gastrointest Endosc*. 2006;64(5):883–834.

18. Attwell A, Hawes R. Surgical clip migration and choledocholithiasis: a late, abrupt complication of laparoscopic cholecystectomy. *Dig Dis Sci*. 2007;52(9):2254–2256.

19. Peterson JM. Surgical clip choledocholithiasis. *Gastrointest Endosc*. 2002;56(1):113.

20. Steffen M, Kronsbein H, Wesche L. Metal clip as a nidus for formation of common bile duct stone following laparoscopic cholecystectomy. *Zeitschrift für Gastroenterologie*. 2007;45(4): 317–319.

21. Dell'Abate P, Del Rio P, Soliani P, Colla G, Sianesi M. Choledocholithiasis causes by migration of a surgical clip after video laparoscopic cholecystectomy. *J Laparoendosc Adv Surg Tech*. 2003;13(3):203–204.

22. Abularach SM, Ashai S. Bowel perforation caused by an endoscopic stapler used during laparoscopically assisted vaginal hysterectomy. *J Reprod Med*. 2000;45(6):504–506.

23. Wasserberg N, Gal E, Fuko Z, Niv Y, Lelcuk S, Rubin M. Surgical clip found in duodenal ulcer after laparoscopic cholecystectomy. *Surg Laparosc Endosc Percutan Tech*. 2003;13(6): 387–388.

24. Schwab K, Cheng E. Endoscopic removal of penetrating surgical clip from the esophagus. *Gastrointest Endosc*. 1993; 39(6):860.

25. Kearse W Jr. Extracorporeal shockwave lithotripsy for kidney stone on surgical clip. *J Endourol*. 1997;11(2):119–120.

26. Ahmed Z, Kaiser L, Shrager J. Benign expectoration of a surgical clip through a pneumonectomy stump. *J Thoracic Cardiovasc Surg*. 2002;124(5):1025–1026.

27. Palou J, Aberola JM, Villavicencio H, Vincente J. It's like a pain in the perineum: a surgical clip protruding into the urethra through the urethrovesical anastomosis after radical prostatectomy. *Scand J Urol Nephrol*. 1997;31(5):493–495.