



Case Report

Acute small bowel obstruction caused by barbed suture on the second day after laparoscopic hysteroscropepy: A case report and literature review

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ARTICLE INFO

Article history:

Accepted 21 March 2016

Keywords:

barbed suture
hysteroscropepy
intestinal obstruction
laparoscopy

ABSTRACT

Objective: To report a case of small bowel obstruction caused by barbed suture applied in hysteroscropepy, and possible solutions.**Case Report:** A 57-year-old woman underwent laparoscopic hysteroscropepy for a Stage 2 uterine prolapse, presenting with acute abdominal pain and a bowel obstruction syndrome 2 days following the surgery. Conservative treatment was given, but the symptoms did not improve and gradually became worse. Diagnostic laparoscopy was performed on the 7th day after the hysteroscropepy, and the volvulus was found. The residual end of the barbed V-Loc adopted in the peritoneal closure was incidentally hooked to the mesentery and caused small bowel obstruction. The redundant V-Loc was released and cut off at 2 cm. Neither bowel ischemia nor significant bowel injury was noted. Two days later, she was discharged without complication.**Conclusion:** A barbed suture has a risk of bowel obstruction when used in surgery. To avoid a grave prognosis, early diagnosis and prompt management of complication is necessary.© 2017 Taiwan Association of Obstetrics & Gynecology. Publishing services by Elsevier B.V. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

Introduction

Laparoscopic surgery is commonly performed nowadays because it is characterized by low pain, fast recovery, short hospital stay, and good effect on physical appearance. Laparoscopic hysteroscropepy for pelvic organ prolapse (POP) is better than classical abdominal hysteroscropepy because of the short recovery time involved and its minimally invasive nature. Laparoscopic hysteroscropepy has a success rate of 90% [1]. In this procedure, the surgeon opens the peritoneum and places the mesh extraperitoneally, then sutures the opened peritoneum. Barbed suture is applied widely in laparoscopic surgery such as myomectomy and sacrocolpopexy, because no knots have to be tied. Barbed suture can shorten the peritoneal closure time of laparoscopic hysteroscropepy. However, bowel complication has been reported mostly in myomectomy [2–5], vagina cuff closure [6], and sacrocolpopexy [7,8]. This investigation reports a

case of small bowel obstruction caused by barbed suture during laparoscopic hysteroscropepy and the possible solutions.

Case Report

A 57-year-old woman underwent laparoscopic hysteroscropepy for a Stage 2 uterine prolapse [9]. Serosal layer of the uterus and presacral peritoneum were opened. A nonabsorbable Y-mesh (Alyte; Bard Medical, Covington, GA, USA) was sutured to the anterior and posterior cervix. The proximal end of the Y mesh was anchored to the sacrum with ProTack (Covidien, Mansfield, MA, USA). The peritoneum was then closed using V-Loc (Covidien, Mansfield, MA, USA). The residual end of V-Loc was 1 cm in length. An adhesion barrier of Seprafilm (Genzyme Corp., Framingham, MA, USA) was placed over the rough surface including the V-Loc site. The procedure went smoothly without complication during surgery. Oral intake was commenced about 8 hours after the operation. The day after the operation, the patient complained of difficult defecation; therefore, glycerin ball enema was performed, and the amount of stool was moderate. Two days later, her general condition was

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deemed fair, and she did not report any abdominal pain; therefore, she was discharged in the morning.

However, diffuse abdominal pain and vomiting after meals were noted on the night of the discharge day. A general survey was taken at the emergency room. She was afebrile, and her blood test showed no leukocytosis and normal C-reactive protein level. Her abdominal X-ray result revealed ileus over the small bowel; therefore, paralytic ileus was diagnosed at the very beginning. Medication for symptom relief, nasogastric tube insertion, and EVAC enema were administered accordingly. However, her symptoms did not improve and became worse each day. Abdominal computed tomography with contrast showed a significant threshold between the distended and collapsed small bowel over the pelvis (Figure 1). Diagnostic laparoscopy was conducted 7 days after the hystererosacropexy, and the volvulus was found. The mesentery was hooked by the residual end of barbed V-Loc, compressing the small bowel and causing small bowel obstruction (Figure 2). To solve the problem, the redundant V-Loc was released with a 2-cm cutoff. Neither bowel ischemia nor significant bowel injury was noted. Her condition improved, and her appetite recovered after the surgery. Bowel movement and stool passage were fair. She was discharged from the hospital 2 days later.

Discussion

This is a case of small bowel obstruction caused by barbed suture used for peritoneal closure. Acute abdominal pain occurred 2 days after the surgery, and conservative treatment failed to relieve the symptoms. Therefore, the patient received emergent laparoscopy on the 7th day after the surgery to release the barbed suture from the small bowel without any complication.



Figure 1. Abdominal computed tomography with contrast indicated a significant cutoff point between the distended small bowel and collapsed small bowel over the pelvis, near the previous V-Loc remnant site (Right presacral region, arrow).

Laparoscopic hystererosacropexy or sacrocolpopexy for POP is linked with longer surgery time than vaginal route POP surgery. Therefore, surgeons use any method available to shorten the surgical time when using these procedures. The barbed suture is knotless, and thus could shorten the time for closing the peritoneum. The safety of barbed suture has been evaluated [10]. A study of 52 patients who received laparoscopic myomectomy found only one patient who experienced small bowel obstruction, subsequently needing repeated laparoscopy [10]. In abdominal sacrocolpopexy, the complication rate of small bowel obstruction ranges from 1.9% to 2.5%, and all patients required reoperation [11].

Barbed sutures include Quill SRS (Angiotech Pharmaceuticals, Inc., Vancouver, BC, Canada), V-Loc, and Stratafix (Ethicon, Somerville, NJ, USA). Despite their benefits on laparoscopy [12], use of barbed suture in surgery requires care, because it carries some risk. Small bowel obstruction resulting from barbed suture has been reported in gynecologic surgeries, which are shown in Table 1 [2–8].

Table 1 shows eight case reports, indicating that laparoscopic myomectomy is the most performed surgery (4/8) [2–5]. Two cases used V-Loc, and the other cases used Quill or a spiral barbed suture. The occurrence time of bowel obstruction ranges from 3 weeks to 6 weeks. Only in one case were antiadhesive barriers used. The absorption time of antiadhesive barriers such as Interceed (Ethicon) or Seprafilm ranges from 7 days to 1 month. Nevertheless, barbed sutures have absorption times in the range of 90–180 days. Antiadhesive barriers do not appear to prevent complications in sutures.

According to Table 1, sacrocolpopexy is the second most performed surgery (3/8) [7,8], including our case. This surgery adopts a barbed suture for closing the peritoneum to prevent bowel entrapment by mesh. Small bowel obstruction occurred 2 days, 8 days, and 4 weeks after the surgery, all of which occurred when V-Loc sutures were used. One case experienced open laparotomy with severe pelvic adhesions, but no intestinal injury was noted [8]. In our case, Seprafilm prevented pelvic adhesions, but it did not prevent mesentery hooked by barbed suture.

Table 1 presents one case of bowel obstruction after 7 days following vaginal cuff closure by barbed suture (1/8) [6]. The vaginal cuff was closed by Quill and Lapra Ty suture clips. However, the secondary laparoscopy revealed bowel obstruction caused by 4 cm of the remnant barbed suture. The authors suggested trimming the barbed suture and minimize the length of the tail.

This reported complication that resulted from barbed suture is not a rare event, and most such events may not be reported. To prevent this painful experience, this work proposes the following approach when performing surgery using barbed suture. First, for a tensile wound closure such as a myomectomy wound, an additional suture to the adjacent myometrium is recommended to secure the suture end, and the end of V-Loc should be cut just parallel to the surface of the uterus to avoid complication. Second, for nontensive wound closure such as peritoneal wound in hystererosacropexy, cut the end of V-Loc just parallel to the surface of peritoneum, or fix the residual end with hemoclip or classical suture figure-of-eight, and/or cover with Interceed.

All these complications occur because the remnant length of the barbed suture is long enough to entrap the small bowel. In our case, 1 cm of the free barbed suture was left outside the peritoneum. However, the barbed suture remnant length became 2.5 cm during the second laparoscopy, because of the peritoneal extraction. In this case, cutting off the barbed suture and leaving no remnant or using conventional suture materials may prevent bowel obstruction. Nevertheless, there is still some barbed suture left above the peritoneum. We could not totally avoid the risk of entrapping the bowel. Surgeons and patients have to know the risk of bowel

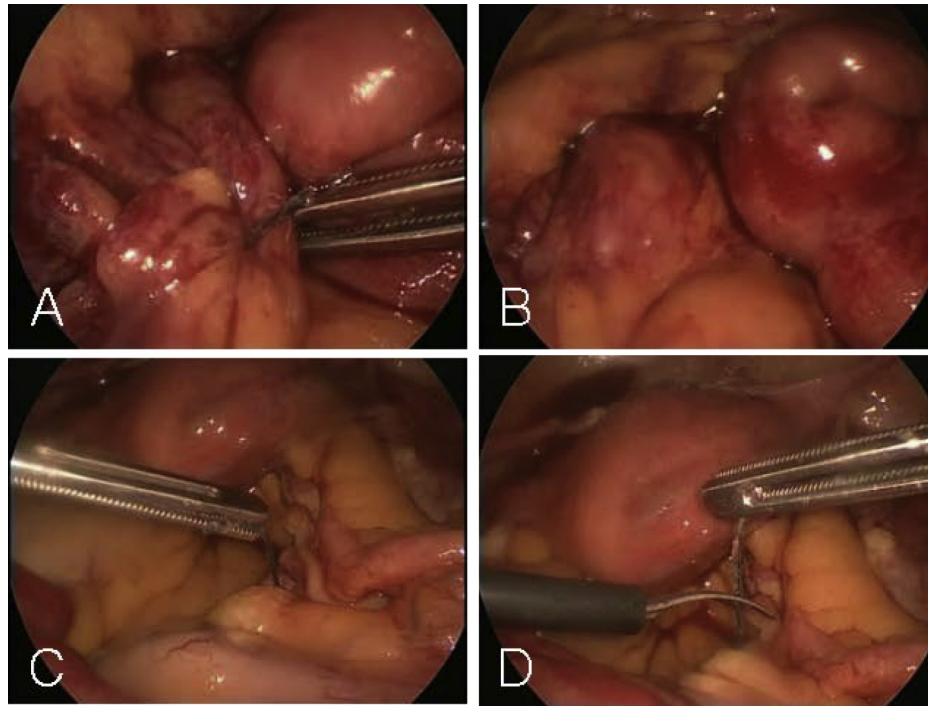


Figure 2. The laparoscopic view. (A) The mesentery was hooked by the residual end of barbed V-Loc, compressing to the small bowel and causing small bowel obstruction. (B) After release of V-Loc, the mesentery and small bowel were separated. (C) The remnant of V-Loc. (D) Cutoff of the remnant of V-Loc approximately 2 cm in length.

Table 1

Comparison of the present case with previous reports.

Report	Surgery	Postoperative time	Suture	Antiadhesive barriers
Present case	Hysterosacropexy	2 d	V-Loc	Seprafilm
Donnellan and Mansuria [6]	Vaginal cuff closure	30 d	0-PDO Quill	No
Thubert et al [8]	Sacrocolpopexy	4 wk	V-Loc	No
Buchs et al [7]	Sacrocolpopexy	8 d	V-Loc	No
Kindinger et al [2]	Myomectomy	4 wk	V-Loc	SprayShield
Rombaut et al [4]	Myomectomy	3 wk	Quill SRS	No
Burchett et al [5]	Myomectomy	3 d/4 wk	V-Loc	No
Lee and Wong [3]	Myomectomy	6 wk	Spiral barbed suture	No

All surgery performed by laparoscopy.

obstruction when adopting a barbed suture. Early diagnosis and prompt management of complication are required to avoid a grave prognosis.

Conflicts of interest

The authors have no conflicts of interest relevant to this article.

Acknowledgments

The authors thank the Buddhist Tzu Chi General Hospital, Taiwan, for financially supporting this research under Contract No. TCRD 105-12. Ted Knoy is appreciated for editing the manuscript.

References

- [1] Price N, Slack A, Jackson SR. Laparoscopic sacrocolpopexy: an observational study of functional and anatomical outcomes. *Int Urogynecol J* 2011;22: 77–82.
- [2] Kindinger LM, Setchell TE, Miskry TS. Bowel obstruction due to entanglement with unidirectional barbed suture following laparoscopic myomectomy. *Gynecol Surg* 2012;9:357–8.
- [3] Lee ET, Wong FW. Small bowel obstruction from barbed suture following laparoscopic myomectomy—a case report. *Int J Surg Case Rep* 2015;16:146–9.
- [4] Rombaut S, Baulies S, Cusido M, Barri-Soldevila P, Rodriguez I, Ubieda A. Quill barbed suture-related complication. *Gynecol Surg* 2012;9:359–61.
- [5] Burchett MA, Mattar SG, McKenna DT. Iatrogenic intestinal and mesenteric injuries with small bowel volvulus following use of barbed suture during laparoscopic myomectomy. *J Laparoendosc Adv Surg Technol A* 2013;23: 632–4.
- [6] Donnellan NM, Mansuria SM. Small bowel obstruction resulting from laparoscopic vaginal cuff closure with a barbed suture. *J Minim Invasive Gynecol* 2011;18:528–30.
- [7] Buchs NC, Ostermann S, Hauser J, Roche B, Iselin CE, Morel P. Intestinal obstruction following use of laparoscopic barbed suture: a new complication with new material? *Minim Invasive Ther Allied Technol* 2012;21: 369–71.
- [8] Thubert T, Pourcher G, Deffieux X. Small bowel volvulus following peritoneal closure using absorbable knotless device during laparoscopic sacral colpopexy. *Int Urogynecol J* 2011;22:761–3.
- [9] Persu C, Chapple CR, Cauni V, Gutue S, Geavlete P. Pelvic Organ Prolapse Quantification System (POP-Q) — a new era in pelvic prolapse staging. *J Med Life* 2011;4:75–81.
- [10] Einarsson JI, Vellinga TT, Twijnstra AR, Chavan NR, Suzuki Y, Greenberg JA. Bidirectional barbed suture: an evaluation of safety and clinical outcomes. *JSLS* 2010;14:381–5.
- [11] Whitehead WE, Bradley CS, Brown MB, Brubaker L, Gutman RE, Varner RE, et al. Gastrointestinal complications following abdominal sacrocolpopexy for advanced pelvic organ prolapse. *Am J Obstet Gynecol* 2007;197:78 e1–7.
- [12] Tulandi T, Einarsson JI. The use of barbed suture for laparoscopic hysterectomy and myomectomy: a systematic review and meta-analysis. *J Minim Invasive Gynecol* 2014;21:210–6.