

CASE REPORT

Early Postoperative Small Bowel Obstruction associated with the use of V-loc™ Sutures during Surgery for Pelvic Organ Prolapse

¹John Tillou, ²Roger Eduardo, ³Deborah Nagle, ⁴Thomas Cataldo, ⁵Janet Li, ⁶Roger Lefevre, ⁷Vitaliy Poylin

ABSTRACT

Aims: To describe three cases of early postoperative bowel obstruction after use of barbed suture material during surgery for pelvic organ prolapse (POP).

Introduction: The utilization of minimally invasive surgical techniques for the treatment of POP is increasing, with a subsequent increase in the use of barbed, self-anchoring suture material, such as the V-loc™ suture, which facilitates intracorporeal suturing.

Case report: We present three cases of early postoperative small bowel obstruction related to the use of barbed sutures during minimally invasive surgery for POP, as well as a review of the relevant literature.

Conclusion: Surgeons should use barbed suture material judiciously and should have a high index of suspicion for barbed-suture related mechanical obstructions. These obstructions are not likely to resolve with conservative management.

Clinical significance: Barbed suture materials allow for ease of laparoscopic suturing but carry a risk of contributing to early bowel obstruction. Laparoscopic surgeons should be aware of this relatively unknown potential complication.

Keywords: Bowel obstruction, Case report, Prolapse, Surgery, Suture.

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^{1,2}Resident, ³Chief, ^{4,6,7}Surgeon, ⁵Section Head

^{1-4,7}Division of Colon and Rectal Surgery, Beth Israel Deaconess Medical Center, Boston, Massachusetts, USA

⁵Division of Urogynecology, Beth Israel Deaconess Medical Center, Boston, Massachusetts, USA

⁶Division of Female Pelvic Medicine and Reconstructive Surgery Beth Israel Deaconess Medical Center, Boston Massachusetts USA

Corresponding Author: Vitaliy Poylin, Surgeon, Division of Colon and Rectal Surgery, Beth Israel Deaconess Medical Center, Boston, Massachusetts, USA, Phone: +6176674159 e-mail: vpoylin@bidmc.harvard.edu

INTRODUCTION

Minimally invasive surgical approaches are being employed more frequently in the treatment of pelvic organ prolapse (POP).¹ The V-loc™ suture (Covidien, Mansfield, MA, USA), a unidirectional, barbed, self-anchoring suture, available in either absorbable or nonabsorbable forms, is frequently utilized during the performance of maneuvers which require intracorporeal suturing, such as peritoneal closure or sutured rectopexy. The advantage of the V-loc™ suture is that multiple rows of barbs allow for the creation of a self-anchoring, running closure without the need for intracorporeal knots.² This allows for easier laparoscopic suturing and potentially decreased operative times.^{2,3} When using this type of barbed suture, it is considered common practice to leave several centimeters of the cut end of the stitch exposed in order to prevent potential tissue slippage.^{3,4} However, as has been demonstrated in several recent case reports,⁴⁻¹⁰ a potential downside to this practice and to the use of such suture material is that exposed suture barbs may catch on adjacent small bowel, mesentery, or omentum leading to serosal injury, obstruction, or volvulus. Here, we report three such cases of small bowel obstruction in the early postoperative period related to the use of V-loc™ sutures during minimally invasive POP surgery.

CASE REPORTS

Case 1

A 53-year-old female with a 1-year history of full thickness, reducible rectal prolapse underwent a robotic rectopexy. The rectopexy was performed using 2-0 nonabsorbable V-loc™ sutures on both sides of the sacrum at the level of S3, and the pelvic peritoneum was closed in a running fashion using an additional absorbable 2-0 V-loc™ stitch. On postoperative day number 25, she presented with a several-day history of abdominal pain, distention, emesis, and failure to pass flatus. A computed tomography (CT) scan was notable for a small bowel obstruction with a transition point in the distal ileum at the level of the rectopexy (Fig. 1). She was subsequently taken for a diagnostic laparoscopy, which revealed an adhesive band, entrapping the distal ileum, attached to

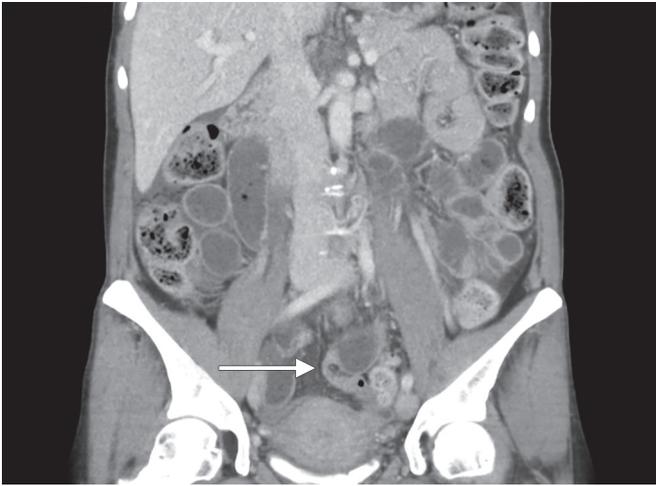


Fig. 1: Small bowel obstruction with a transition point (arrow) in the distal ileum at the level of the rectopexy

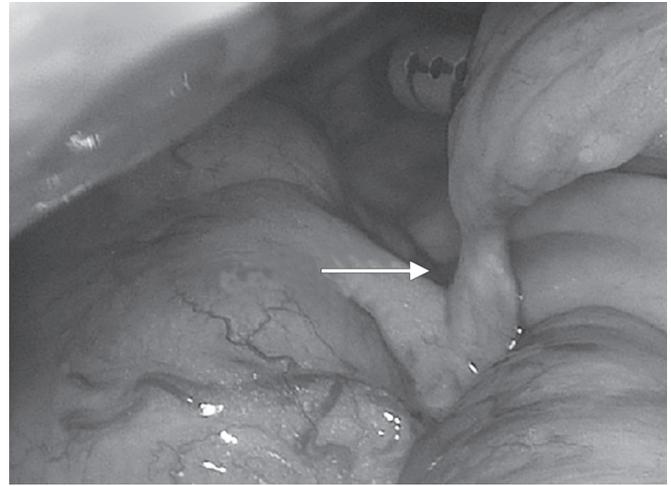


Fig. 2: Adhesive band (arrow) entrapping the terminal ileum with V-loc™ suture nidus



Fig. 3: After release of the adhesive band (arrow), the residual suture end is visible

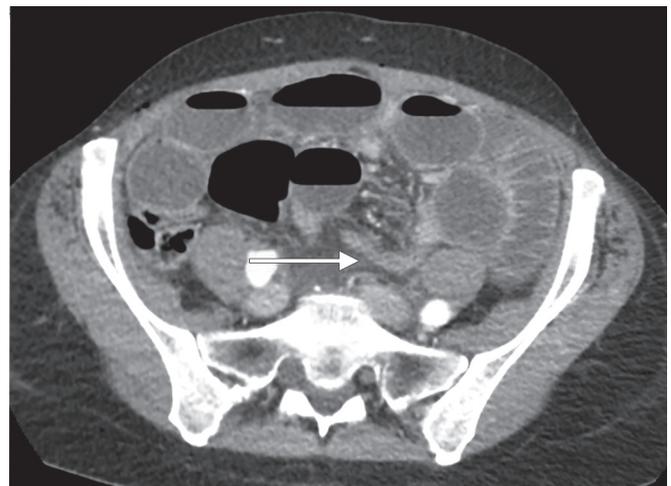


Fig. 4: Transition point (arrow) in the mid-ileum at the level of the rectopexy

the free end of the nonabsorbable V-loc™ suture on the right side of the rectopexy. This band was divided and the V-loc™ was trimmed down to its base (Figs 2 and 3). She was discharged home on postoperative day number 4 after an uneventful postoperative course.

Case 2

A 57-year-old female underwent a robotic hysterectomy and sacro-cervicopexy for clinical Pelvic Organ Prolapse Quantification (POP-Q) stage III uterovaginal prolapse. A Restorelle™ Y-mesh (Coloplast, MN, USA) was sutured to the posterior wall of the vagina and secured to the anterior longitudinal ligament at the level of the sacral promontory. The mesh was retroperitonealized by reapproximating the cut peritoneal edges over the mesh in a running fashion using an absorbable 2-0 V-loc™ suture. She presented 7 days later with abdominal distention, nausea, and vomiting. A CT scan revealed a transition point in the distal ileum at the level of the sacral

promontory (Fig. 4). Her symptoms resolved after several days of bowel rest. She represented on postoperative day number 33 with recurrent abdominal distension and emesis. Repeat CT scan again demonstrated a small bowel obstruction with a transition point in the distal ileum at the level of the sacral promontory. She underwent a diagnostic laparoscopy that demonstrated a 3-cm long segment of the V-loc™ suture emanating from the apex of the pelvic peritoneal closure which had unfurled. This elongated free end had penetrated the nearby small bowel mesentery and subsequently formed an adhesion to the distal ileum. The remnant suture end was freed and was cut flush with the peritoneum until no stitch edge was visible. She was discharged home on postoperative day number 2 after an unremarkable postoperative course.

Case 3

A 33-year-old female who underwent a redo robotic ventral rectopexy with sacrohysteropexy for recurrent rectal

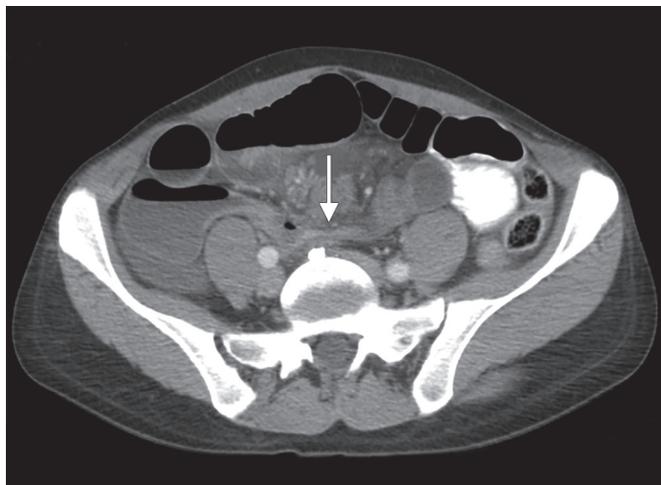


Fig. 5: Transition point (arrow) in the distal ileum at the level of the sacral promontory

prolapse as well as clinical POP-Q stage II uterovaginal prolapse presented on postoperative day number 46 with a multiple-day history of abdominal pain, distention, and emesis. During the redo operation, the previously placed rectopexy mesh was found to be loose and was resecured to the sacrum just below the sacral promontory with tacks, and added support was provided to the rectopexy by using a permanent 2-0 V-loc™ suture to secure the rectum on both sides of the sacrum. The posterior vagina was secured with an additional piece of mesh to the sacral promontory as well. An absorbable 2-0 V-loc™ suture was then used to close the peritoneum over the implanted mesh in a running manner. At the time of presentation to the emergency room, a CT scan was notable for a small bowel obstruction with a transition point in the mid-ileum at the level of the rectopexy (Fig. 5). She was brought to the operating room for diagnostic laparoscopy, which demonstrated a loop of ileum adherent to an exposed portion of the nonabsorbable V-loc™ suture that had been used for the rectopexy. The suture had protruded through the peritoneal closure. The adhesion was lysed and the exposed portion of the stitch was debrided flush with the peritoneum. She was discharged home on postoperative day number 2 after an otherwise uneventful course.

DISCUSSION

We present here three cases of postoperative bowel obstruction requiring reoperation due to the use of barbed suture material during minimally invasive surgery for POP – a complication which has gained relatively little exposure in the current literature and which many surgeons are likely not aware of. While the use of barbed sutures, such as the V-loc™ provides some technical advantages, including the potential for decreased operative time, they are not without drawbacks. As demonstrated

in our series, as well as in the few case reports which exist, if free suture ends are left exposed, the barbs have the potential to catch on nearby tissues – such as small bowel, mesentery, or omentum – leading to possible serosal injury, obstruction, or small bowel volvulus.⁴⁻¹⁰

Recently, a group from New York¹¹ reported two cases of small bowel obstruction 3 to 4 weeks after robotic-assisted sacral colpopexy. At reoperation, both individuals were found to have small bowel loops adherent to exposed barbed suture segments that had been used to retroperitonealize newly implanted mesh. Barbed suture material serving as a nidus for volvulus has been reported as well. Thubert et al⁵ reported the case of a 61-year-old female who suffered from a small bowel volvulus 1 month after undergoing laparoscopic sacral colpopexy during which a V-loc V90™ suture had been used to close the pelvic peritoneum. Upon reexploration, the exposed suture end was noted to be adherent to the nearby ileum serving as a rotational axis. In 2014, Salminen et al³ described three cases of barbed-suture-associated small bowel obstruction in the setting of laparoscopic ventral rectopexy during which a V-loc 180™ suture was utilized for peritoneal closure. The authors deliberately left 2 to 3 cm of the cut barbed suture end exposed in order to ensure adequate peritoneal fixation. In all three instances, the exposed suture was found to be adherent to either small bowel or omentum. Despite these reports, V-loc™ suture-related complications likely remains an under-recognized event.

Due to concerns for barbed-suture-related complications, Salminen et al³ noted that it is author's standard practice to trim the suture back to be flush with the peritoneum. Whether this has made a difference in the long run was not reported. Interestingly, based on recent animal models, trimming the cut end of the barbed suture flush with the tissue or burying the end under peritoneum may not reduce the likelihood of these complications^{4,12,13} as the barbs may become exposed if there is slippage of tissue. At the beginning of their experience with the V-loc™ device for peritoneal closure during laparoscopic ventral rectopexy, Sakata et al⁴ typically left several centimeters of the cut barbed suture end exposed. However, after managing the resultant barbed-suture-related small bowel obstruction in four postoperative patients, the authors modified their technique and trimmed the cut barbed end flush with the peritoneum in subsequent cases. Despite this change in technique, they reported several additional early postoperative small bowel obstructions related to the use of the barbed suture. On reoperation, previously buried barbed suture segments were noted to be exposed. The authors theorize that over time the closed peritoneum contracts, leading to potentially exposed suture material. As we

noted in our second case, there is also the potential for the stitch itself to unravel from the peritoneum leading to stitch exposure.¹³ Despite this, based on our findings of obstruction related to remnant suture ends in all three of the cases presented here, we would advocate for minimization of the exposed length of remaining barbed suture.

CONCLUSION

Although our earliest patient presented on postoperative day number 3, obstructive complications after the use of barbed sutures have been reported as early as 1 day after the initial operation.⁷ Surgeons should be judicious in their use of barbed suture devices and should have a high index of suspicion for barbed-suture related bowel obstruction in the early postoperative period with the knowledge that these forms of mechanical obstruction will likely not be amenable to conservative management.

CLINICAL SIGNIFICANCE

While barbed suture materials, such as the V-loc™ suture allow for easier laparoscopic suturing and potentially decreased operative time, exposed suture material may catch on adjacent tissues potentially serving as a nidus for early mechanical obstruction. It is important for laparoscopic surgeons to be aware of this relatively unknown potential complication.

REFERENCES

1. Consten EC, van Iersel JJ, Verheijen PM, Broeders IA, Wolthuis AM, D'Hoore A. Long-term outcome after laparoscopic ventral mesh rectopexy: an observational study of 919 consecutive patients. *Ann Surg* 2015 Nov;262(5):742-748.
2. Patri P, Beran C, Stjepanovic J, Sandberg S, Tuchmann A, Christian H. V-loc, a new wound closure device for peritoneal closure – is it safe? A comparative study of different peritoneal closure systems. *Surg Innov* 2011 Jun;18(2):145-149.
3. Salminen HJ, Tan WS, Jayne DG. Three cases of small bowel obstruction after laparoscopic ventral rectopexy using the V-loc® suture. *Tech Coloproctol* 2014 Jun;18(6):601-602.
4. Sakata S, Kabir S, Petersen D, Doudle M, Stevenson AR. Are we burying our heads in the sand? Preventing small bowel obstruction from the V-loc® suture in laparoscopic ventral rectopexy. *Colorectal Dis* 2015 Sep;17(9):180-183.
5. Thubert T, Pourcher G, Deffieux X. Small bowel volvulus following peritoneal closure using absorbable knotless device during laparoscopic sacral colpopexy. *Int Urogynecol J* 2011 Jun;22(6):761-763.
6. Köhler G, Mayer F, Lechner M, Bittner R. Small bowel obstruction after TAPP repair caused by a self-anchoring barbed suture device for peritoneal closure: case report and review of the literature. *Hernia* 2015 Jun;19(3):389-394.
7. Vasudevan SP, Dworkin MJ. Small bowel obstruction following laparoscopic ventral mesh rectopexy. *Colorectal Dis* 2013 Dec;15(12):1543-1544.
8. Lee ET, Wong FW. Small bowel obstruction from barbed suture following laparoscopic myomectomy: a case report. *Int J Surg Case Rep* 2015;16:146-149.
9. Buchs NC. Intestinal obstruction following use of laparoscopic barbed suture: a new complication with new material? *Minim Invasive Ther Allied Technol* 2011 Sep;21(5):369-371.
10. Quibel S, Roman H, Marpeau L. Volvulus following barbed suture. *Gynecol Obstet Fertil* 2012 Jun;40(6):382-383.
11. Vahanian SA, Finamore PS, Lazarou G. Delayed small bowel obstruction after robotic-assisted sacrocolpopexy. *Female Pelvic Med Reconstr Surg* 2015 Jan-Feb;21(1):e11-e13.
12. Api M. Peritoneal closure over barbed suture to prevent adhesions: a randomized controlled trial in an animal model. *J Minim Invasive Gynecol* 2015 May-Jun;22(4):619-625.
13. Kindinger L, Setchell T, Miskry T. Bowel obstruction due to entanglement with unidirectional barbed suture following laparoscopic myomectomy. *Gynecol Surg* 2012 Sep;9(3):357-358.