

Small Bowel Obstruction After Absorbable Mesh Wrap Splenorrhaphy

S Martinez, S Young, J Brebbia

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Abstract

Absorbable polyglactic (Vicryl) or polyglycolic acid (Dexon) mesh wrap splenorrhaphy has added to the ease and safety of splenic salvage. We present a case of small bowel obstruction resulting from polyglactic (Vicryl) mesh placed during a prior wrap splenorrhaphy. The literature regarding complications of mesh wrap splenorrhaphy is reviewed.

Of 116 reported cases of absorbable mesh wrap splenorrhaphy, a total of 39 complications were reported, giving a complication rate of 33.6%. The majority of complications were pulmonary (64%), followed by peri-splenic fluid collections (21%), abscess (5%), re-bleeding (5%), incisional hernia (2.5%) and small bowel obstruction (2.5%).

Absorbable mesh may promote inflammation significant enough to produce dense adhesions. Bowel obstruction should be considered in the differential diagnosis of a patient with nausea and vomiting up to three months following absorbable mesh placement.

INTRODUCTION

Within the last 20 years, the immunological and hematological importance of the spleen has become firmly established, and gone are the days when an injured spleen may be removed with impunity. Recognition of the syndrome of overwhelming post-splenectomy sepsis (OPSS) has ushered in an era of splenic salvage with a focus on non-operative treatment, partial splenectomy, splenorrhaphy, ectopic splenic implantation and, most recently, splenic capping or wrapping with absorbable polyglactic (Vicryl) or polyglycolic acid (Dexon) mesh^{1,2,3,4,5,6,7,8,9,10,11,12,13,14}. Wrap splenorrhaphy involves wrapping the injured organ with absorbable mesh under tension to provide hemostasis and structural support. The mesh has been shown to assist in forming a pseudocapsule around the entire spleen before being completely resorbed^{1,10,15}. Both polyglactic and polyglycolic acid mesh are dissolved by hydrolysis over a period of ninety days^{1,15,16}. Because of the relatively early resorption of the mesh, any long-term foreign body inflammatory reaction is minimized.

Absorbable mesh wrap splenorrhaphy may be performed with few serious post-operative complications. The majority of complications are related to peri-splenic or pulmonary effusions, are non-infectious, transitory, and require no

intervention^{2,5,6,7,8,11,12}. Given the rarity of post-operative complications associated with this procedure, we would like to present a case of small bowel obstruction that we attribute to the use of absorbable mesh from a prior wrap splenorrhaphy.

CASE PRESENTATION

The patient is a 14-year-old female who sustained a grade IV splenic laceration requiring wrap splenorrhaphy with absorbable polyglactic mesh after involvement in a motor vehicle accident. She was discharged home on her eighth postoperative day, but returned eighteen days post-operatively with a three-day complaint of nausea and bilious vomiting. She denied fevers or chills, abdominal pain or distension and reported passing both a bowel movement and flatus on the morning of her presentation.

On physical examination, the patient was afebrile (99.8 F), with a heart rate of 121 bpm and blood pressure of 132/80mm Hg. Abdominal examination revealed a well-healing midline abdominal incision, normoactive bowel sounds, and an absence of both tenderness and distension. Laboratory studies revealed a white blood count of 15.8, hemoglobin of 14.1 g/dl, hematocrit of 41.2%, and platelets of 731.

Upright chest and abdominal radiographs revealed no evidence of free air or obstruction. A CT scan of the abdomen and pelvis was obtained to rule out a peri-splenic abscess. CT scan revealed multiple dilated small bowel loops transitioning proximally to collapsed small bowel and colon.

The patient was intravenously hydrated, a nasogastric tube placed, and the decision made to treat the patient non-operatively for 24 hours. Continued elevated white blood count and lack of symptomatic improvement indicated a return to the operating room for exploration 24 hours after initial presentation. Intra-operatively, dense adhesions in the left upper quadrant associated with the previously placed polyglactic mesh were noted. A dilated, proximal loop of jejunum was stuck to the mesh, and bowel distal to this point was collapsed. All adhesions were lysed, and the abdomen was closed. The patient's nasogastric tube was removed 48 hours post-operatively and a clear liquid diet instituted. The patient was discharged home on her sixth postoperative day without further gastrointestinal complaint.

DISCUSSION

Delany et al. reported the first series of patients undergoing absorbable mesh splenorrhaphy in 1985². Since that time, several variations have been described in the literature, with most authors advocating its use for grade III-V splenic injuries. Despite over a decade of experience with this technique, few serious complications have been reported that can be directly related to the use of either polyglactic or polyglycolic acid mesh (Table 1).

Figure 1

Table 1: Post-operative complications in 116 cases of wrap splenorrhaphy

Author	Year	N	Complications
Delany et al.	1985	6	N = 1 pulmonary
Niskanen et al.	1987	2	N = 0
Tribble et al.	1987	3	N = 1 bowel obstruction
Lange et al.	1988	9	N = 8 pulmonary N = 2 peri-splenic fluid
Fingerhut et al.	1992	17	N = 2 peri-splenic fluid N = 1 incisional hernia N = 1 pulmonary
Delany et al.	1993	60	N = 13 pulmonary N = 4 peri-splenic fluid N = 2 abscess
Sondenaa et al.	1994	8	N = 2 re-bleed N = 2 pulmonary
Fasoli et al.	1998	1	N = 0
		Total: 116	Total: 39

Of 116 cases of absorbable mesh wrap splenorrhaphy, 39 complications (34%) were reported. Most complications (64%) involved left lower lobe infiltrates, effusions, atelectasis and pneumonia^{2,4,5,6,7,8,11,12}. If these minor complications are removed, the incidence of post-operative complications is quite low (12%). Perisplenic effusions (20%), abscesses (5%), bleeding (5%), hernias (2%) and bowel obstruction (2%) were less common.

To date, there has only been one reported case of bowel obstruction attributed to the use of absorbable mesh for a wrap splenorrhaphy¹². This patient required laparotomy and lysis of adhesions. Biodegradable mesh has also been used, with few complications, in a variety of surgical procedures.

As an alternative to non-absorbable material, absorbable mesh has been used in the treatment of rectal prolapse¹⁷. One case of small bowel obstruction was reported, but this was treated non-operatively.

Absorbable mesh has been used as a sling to retain the small intestines in the upper abdomen following rectal surgery, eliminating them from the field of subsequent radiation therapy and thereby decreasing the incidence of radiation associated small bowel injury (RASBI)^{18,19,20,21,22,23,24}. No

cases of bowel obstruction requiring laparotomy have been reported.

An identical small bowel exclusion procedure has been described specifically following pediatric and gynecological surgery^{25,26,27,28}. Sener has described three cases of small bowel obstruction with mesh placement after gynecological procedures²⁹. One case was caused by a loop of small bowel herniating between the mesh and pelvic sidewall, necessitating laparotomy and bowel resection. The two remaining cases followed radiation therapy, may have been associated with radiation injury, and were treated non-operatively.

Both Jacobson and Delany have described the use of absorbable mesh in the treatment of liver and kidney injury without bowel obstruction as a postoperative complication

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CONCLUSIONS

Absorbable mesh splenorrhaphy has played an important role in increasing the ease and safety of splenic salvage. The vast majority of complications associated with its use affect the pulmonary system, with pleural effusions, atelectasis and left lower lobe infiltrates being most common. That aside, the use of mesh has had few serious drawbacks.

We have presented the second reported case of small bowel obstruction requiring laparotomy in the early post-operative period after mesh wrap splenorrhaphy. Despite its absorbable nature, an inflammatory tissue reaction significant enough to produce dense adhesions may occur. In a patient presenting with nausea and vomiting who has had a mesh wrap splenorrhaphy in the previous 90 days, small bowel obstruction secondary to adhesions originating from the mesh must be entertained in the differential diagnosis.

CORRESPONDENCE TO

Steve R. Martinez, MD Division of Surgical Oncology John Wayne Cancer Institute 2200 Santa Monica Blvd. Santa Monica, CA 90404 Phone: 310-449-5278 Fax: 310-449-5261 martinezs@jwci.org

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Author Information

Steve R. Martinez, M.D.

Division of Surgical Oncology, John Wayne Cancer Institute

Shawn E. Young, M.D.

Division of Surgical Oncology, John Wayne Cancer Institute

John S. Brebbia, M.D.

Assistant Professor, Department of Surgery, Division of Trauma and Critical Care, State University Hospital of New York at Stony Brook