Planned Ventral Hernia with Absorbable Mesh: A Life-Saving Method in Relaparotomy for Septic Abdomen

Suvit Sriussadaporn MD*,
Sukanya Sriussadaporn MD*, Rattaplee Pak-art MD*,
Krittaya Krittayakirana MD*, Supparerk Prichayuhd MD*

** Department of Surgery, Faculty of Medicine, Chulalongkorn University, Bangkok, Thailand*

Background: *Relaparotomy for abdominal sepsis is occasionally associated with wound edges necrosis and visceral edema prohibiting primary fascial closure. Planned ventral hernia with absorbable mesh is a life-saving method for abdominal wound management in such critically ill surgical patients.*

Objective: *Examine results of treatment of patients who underwent relaparotomy for septic abdomen and closure of abdominal wound with absorbable mesh.*

Material and Method: *A retrospective study of patients who underwent relaparotomy for abdominal sepsis and planned ventral hernia with absorbable mesh between 2004 and 2009 was performed. Data analysis included indication for relaparotomy, type of absorbable mesh used, results of treatment, and status of patients during the follow-up period.*

Results: *Twelve patients participated to the present study. Polyglycolic acid (Dexon) or polyglactin (Vicryl) mesh were used in six patients each. Final wound coverage was skin grafting in five patients (41.7%), skin flaps in one (8.3%), healing by secondary intention in five (41.7%), and human acellular dermal matrix and skin grafting in one (8.3%). One patient (8.3%) developed enterocutaneous fistula. There was no mortality. The hospital stay ranged from 17 to 201 days (mean 118 days).*

Conclusion: *Planned ventral hernia with absorbable mesh is a good alternative in the management of patients who undergo relaparotomy for abdominal sepsis. The procedure is life-saving for these patients.*

Keywords: *Abdominal sepsis, Relaparotomy, Absorbable mesh, Planned ventral hernia*

J Med Assoc Thai 2010; 93 (4): 449-56
Full text. e-Journal: *http://www.mat.or.th/journal*

Abdominal sepsis is the most common indication for relaparotomy after major abdominal surgery[1,3]. Recurrent or persistent abdominal sepsis may be responsible for 25-32% of patients who undergo relaparotomy[1,4]. Mortality of these patients is seriously high, approaching 24-50%[1-5]. Closure of the abdominal wall after relaparotomy may be problematic in some patients owing to massive visceral edema and/or necrosis with or without infection of fascia and muscles at abdominal wound edges (Fig. 1, 2). Inappropriate management of these complicated abdominal wounds at the end of relaparotomy may contribute to complications or even mortality[6,7]. Primary fascial closure in such conditions may be harmful or even impossible. Forceful primary fascial closure may worsen the situation from severe pain, extension of necrosis of wound edges and abdominal compartment syndrome.

In order to avoid untoward consequences and improve survival, appropriate management of such complicated abdominal wounds is of utmost importance. Bridging of the abdominal wound edges with non-absorbable mesh has been recommended by some investigators[7-9]. However, certain complications such as mesh infection and gastrointestinal fistula have rendered this method of abdominal wound management less favorable, especially in the potentially infected field[10,11]. Absorbable mesh has been used and become a good alternative with satisfactory outcome as reported from previous studies[11-14]. Its obvious advantage over the non-absorbable mesh is being a non-permanent foreign body that temporarily maintains abdominal wall integrity while the patient is recovering from secondary peritonitis. The excess intraabdominal fluid can permeate through the porosity of the mesh enhancing drainage of infected materials

Correspondence to: Sriussadaporn S, Department of Surgery, Faculty of Medicine, Chulalongkorn University, Rama 4 Rd, Bangkok 10330, Thailand. Phone: 0-2256-4117, Fax: 0-2256-4194. E-mail: suvit.s@chula.ac.th

Fig. 1 Patient with severe peritonitis from perforated diverticulitis requiring relaparotomy for persistent intraabdominal sepsis after first exploratory laparotomy. Edema and inflammation of bowel, mesentery and omentum prohibited a safe primary fascial closure of the abdomen

Fig. 2 Patient with infected pancreatic necrosis requiring relaparotomy for repeated debridement of necrotic peripancreatic tissue. Massive visceral edema and planned relaparotomy making abdominal closure with absorbable mesh safer than primary fascial closure

from the peritoneal cavity. The open abdomen is carefully managed anticipating for complete coverage of good granulation tissue with subsequent split thickness skin grafting. Some patients are managed by waiting for spontaneous healing with secondary intention (wound contraction and epithelialization). A large ventral hernia is usually unavoidable when using such method of abdominal wound management, so called by some investigators "planned ventral hernia[15]". Repairing of large ventral hernia can be performed safely later when the patients fully recover which is approximately 6 months or more after skin grafting or healing with secondary intention[15].

The purpose of the present study was to examine results of treatment of patients who underwent relaparotomy for abdominal sepsis and abdominal wound management with absorbable mesh (planned ventral hernia) at King Chulalongkorn Memorial Hospital.

Material and Method

A retrospective study was performed in patients who underwent relaparotomy for abdominal sepsis and abdominal wound management with absorbable mesh at King Chulalongkorn Memorial Hospital, Bangkok, Thailand between January 1, 2004 and September 30, 2009. During the study-period, indications for relaparotomy for intraabdominal sepsis were one or both of the following: 1) persistent sepsis after the first operation in spite of intensive conservative treatment and 2) wound dehiscence or evisceration secondary from intraabdominal source of infection.

When relaparotomy was considered necessary, all the stitches of the previous abdominal fascial closure were removed. The abdominal cavity was entered and vigorously irrigated with warm saline solution. All the necrotic tissue, debris, pus, and collections were removed. Obvious perforation of the gastrointestinal tract or anastomotic leakage was closed with silk 2-0 or 3-0 sutures. When a leakage from the gastrointestinal tract was strongly suspected by the presence of gastrointestinal content in the abdominal cavity but no visible defect was detected owing to the walled-off mechanism of the omentum and abdominal viscera, no attempt was made to break or lysis the well-formed adhesion. A controlled fistula was then accepted by placing multiple drains in the abdominal cavity before closure with absorbable mesh. The authors used Penrose drains or silastic tube drains in all cases. The silastic tube drains were used when additional irrigation of the abdominal cavity via the silastic tube was planned.

After the intraabdominal procedures were completed, the abdominal wound was prepared for closure. The necrotic or infected fascial edge was debrided to a well-vascularized viable tissue. Then, the abdominal wall defect was bridged with one or two layers of absorbable mesh. The absorbable mesh used was polyglycolic acid (Dexon) or polyglactin (Vicryl) mesh. The mesh was fixed to the abdominal wound edges with interrupted No. 1-0 polyglactin or

polyglycolic acid sutures (Fig. 3, 4). The abdominal wound was then managed by vacuum-assisted wound closure. First, the absorbable mesh was covered with a large piece of sterile plastic sheet with multiple holes. Then, a polyurethane sponge with 2 No. 18 nasogastric tubes embedded in it was placed over the plastic sheet. After that, the abdominal wound and the polyurethane sponge was sealed with a large sheet of plastic drape applying over the polyurethane sponge and the surrounding skin. The vacuum effect started when the nasogastric tubes were connected to the wall suction. The negative pressure of 80-100 mmHg was suitable for keeping the abdominal wound dry from permeation of fluid through the mesh.

The polyurethane sponge was changed and the wound was examined daily. The granulation tissue was allowed to grow and cover the mesh waiting for split-thickness skin grafting (Fig. 5, 6) or healing by secondary intention (wound contraction and epithelialization). In some cases, the final wound coverage was performed by skin flaps or the use of human acellular dermal matrix.

Results

During the 69-month period ending in September 2009, 12 patients entered into the present study. The age ranged from 17 to 72 years (mean 50 years). Eight patients (66.7%) were male and four (33.3%) were female. Indications for the first and relaparotomy with absorbable mesh placement are shown in Table 1. Polyglycolic acid (Dexon) mesh was used in six patients (50%) and polyglactin (Vicryl)

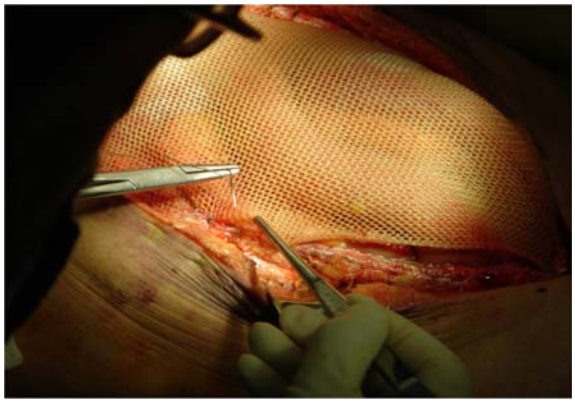

Fig. 3 Closure of the open abdomen with polyglycolic acid mesh. A sheet of polyglycolic acid mesh was sutured to the abdominal fascial edge with interrupted No. 1 polyglycolic acid sutures

Fig. 4 Appearance of the open abdomen after complete closure with polyglycolic acid mesh. The patient had severe peritonitis from anastomotic leakage after trauma and underwent multiple laparotomies

Fig. 5 Demonstrating a good granulation tissue covering absorbable mesh before split-thickness skin grafting was scheduled

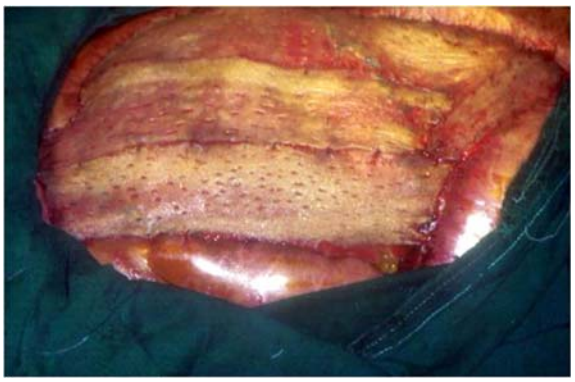

Fig. 6 Final abdominal wound coverage with split-thickness skin grafts over a good granulation tissue

Table 1. Summary of patients

Patients No.	Age (years)	Sex	Indication for 1st laparotomy	Indication for relaparotomy	Type of mesh used	Final wound coverage	Hospital stay (days)
1	72	Male	Large ventral hernia repair with polypropylene mesh	Small bowel fistula	Dexon	Skin flap	17
2	48	Female	Blunt abdominal trauma	Small bowel fistula	Dexon	STSG	147
3	42	Female	Infected pancreatic necrosis	Persistent sepsis	Dexon	2^0 healing	130
4	47	Male	Delayed treatment for stab wound of sigmoid colon	Persistent sepsis	Vicryl	STSG	52
5	41	Female	Pancreatic injury	Intraabdominal sepsis	Dexon	2^0 healing	201
6	71	Female	Whipple operation for CA head of pancreas	Intraabdominal sepsis	Vicryl	STSG	120
7	40	Male	Blunt abdominal trauma infarction	Massive small bowel	Dexon	STSG	172
8	65	Male	Closure of enterocutaneous fistula	Anastomotic leakage	Vicryl	2^0 healing	120
9*	17	Male	Closure of enterocutaneous fistula	Enterocutaneous fistula	Vicryl	2^0 healing	180
10	57	Male	Radical total gastrectom with distal pancreatectomy for CA stomach	Pancreatic fistula with sepsis	Vicryl	2^0 healing	73
11	52	Male	Peptic perforation	Bile leakage with persistent sepsis	Vicryl	2^0 healing	57
12	48	Male	Penetrating abdominal trauma	Missed injury, severe intraabdominal infection	Vicryl	HADM and STSG	150

STSG = split thickness skin grafting, 2^0 healing = healing by secondary intention, HADM = human acellular dermal matrix, * = discharge with fistula

mesh was used in the remaining six patients (50%). All patients are alive and discharged home. The final abdominal wound coverage was skin flaps in one patient (8.3%), split thickness skin grafting in five (41.7%), healing by secondary intention in five (41.7%) and human acellular dermal matrix and skin grafting in one (8.3%). The hospital stay ranged from 17 days to 201 days (mean 118 days). One patient (8.3%) developed enterocutaneous fistula and was discharged home with fistula after a relatively prolonged hospital course.

During this manuscript preparation, two patients had died from advanced cancer of the stomach in one and cancer of the pancreas in the other. Two patients had already undergone ventral hernia repair by components separation method in one and by placement of a non-absorbable mesh in the other. Two patients had no clinical detectable ventral hernia due to fibrosis of the open abdominal wound, which was healed by secondary intention. One patient is scheduled for ventral hernia repair in the next few months. The remaining five patients are still followed and will undergo subsequent ventral hernia repair in the future if indicated.

Discussion

Relaparotomy after major abdominal operation may be performed for one or more of the following reasons: 1) intraabdominal bleeding, 2) intraabdominal sepsis unresponsive to intensive conservative management 3) gastrointestinal obstruction requiring surgical correction 4) wound dehiscence[2,3]. When relaparotomy is performed owing to persistent abdominal sepsis, high mortality is observed. Multi-system organ failure was the major cause of death in these patients[3,4]. To improve outcome of these seriously ill patients, relaparotomy when indicated, are frequently required for better control of sepsis. Relaparotomy should be performed when clinical sepsis persists after the first operation with demonstrable intraabdominal collections by ultrasonography or computed tomography unamenable for percutaneous drainage[16,17]. Wound sepsis with total wound dehiscence and/or evisceration, which is usually secondary from the intraabdominal infection, is also an indication for relaparotomy.

Upon abdominal re-exploration, gross collections or contamination should be removed. Any demonstrable perforation or leakage should be sutured and covered with omentum, if available. Massive disruption of the previously performed anastomosis should be converted to enterostomy or colostomy. When perforation cannot be obviously demonstrated but its presence is strongly suspected, multiple drains are placed and controlled fistula is accepted. In almost all circumstances, surgeons usually encounter more or less a degree of fascial necrosis or fasciitis necessitating debridement. Debridement of rectus addominis fascia should be performed adequately to a healthy viable tissue to prevent persistent infections or fasciitis, which we strongly believe is a major cause of treatment failure. Management of the abdominal wounds at the final step is crucial. A common mistake frequently practiced is to attempt forceful primary fascia to fascia abdominal closure with strong sutured. This method of abdominal closure is optimistically performed with great expectation of uneventful recovery without ventral hernia. However, a high price to pay for failure of such decision is progressive necrosis of rectus muscles and fascia from undue tension. Furthermore, excessive wound pain may compromise patients' recovery. In addition, the risk of abdominal compartment syndrome still exists.

The use of synthetic mesh for closure of complicated abdominal wound has been advocated for several decades[7-11,18]. Non-absorbable mesh has been used in the early period with variable outcome. The obvious disadvantage well-known to surgeons is gastrointestinal fistula from erosion of the mesh into the bowel lumen making its use no longer recommended in definitive management of open abdomen nowadays[7,10,11,15]. Absorbable mesh becomes more popular for open abdomen management and is recommended by several investigators[11-15]. Some investigators recently reported a satisfactory result of abdominal closure with components separation technique, a method first introduced for repair of a large ventral hernia[15,19,20]. The authors have occasionally used this technique in good risk patients. The advantage of such a method is avoidance of future ventral hernia. However, the technique requires dissection of the skin and subcutaneous tissue from the abdominal fascia to both anterior axillary lines, which increases surgical trauma in high risk patients. Furthermore, the presence of infection may prohibit this method of abdominal wall management. Again, patients still encounter definite risk of abdominal compartment syndrome.

The authors believe that planned ventral hernia with absorbable mesh is a good alternative in such a situation. The necrotic or infected rectus abdominis fascia and muscles can be widely debrided

to eliminate the possibility of persistent infection. Abdominal compartment syndrome is effectively prevented by the use of absorbable mesh. Excess intraabdominal fluid may be drained through the mesh resulting in rapid resolution of the visceral edema. Infected fluid is also drained through the mesh. A serious complication of planned ventral hernia well-recognized to surgeons is enterocutaneous or entero-atmospheric fistula[15]. This complication is extremely difficult to manage and usually associated with a high mortality[21,22]. The authors have encountered such a complication in one patient. To avoid the occurrence of fistula while the abdomen is open, awaiting for good granulation and split-thickness skin grafting or healing by secondary intention, the authors cautiously concentrate on the following details. Firstly, before placement of the absorbable mesh, be sure that no suture-lines of the bowel are exposed to the external environment. Secondly, before placement of the absorbable mesh, try to cover the abdominal viscera with omentum, if available. Thirdly, always covers the absorbable mesh with a multiple-hole polyvinyl plastic sheet before placing a dressing or sponge for vacuum-assisted closure. Finally, apply appropriate negative pressure to the abdominal wound, the authors use -80 mmHg to -100 mmHg in the presented patients. The authors think that the presented results of treatment is acceptable, with no mortality and only one occurrence of enterocutaneous fistula.

Recently, a novel biological material, human acellular dermal matrix has been used in open abdomen patients with increasing popularity[23-27]. Its reported advantages are being a biocompatible material with a high success rate in the presence of infection. However, long-term study is required to clarify its applicability in patients with open abdomen. The authors used this material in the last patient of the presented case series with satisfactory outcome (patient No. 12 in Table 1).

In conclusion, planned ventral hernia with absorbable mesh is a life-saving method in dealing with a complicated abdominal wound during relaparotomy. The procedure is simple and safe in critically ill surgical patients. The authors strongly recommend this method as a good alternative when confronting these potentially lethal situations.

References

1. Tera H, Aberg C. Relaparotomy. A ten-year series. Acta Chir Scand 1975; 141: 637-44.
2. Harbrecht PJ, Garrison RN, Fry DE. Early urgent relaparotomy. Arch Surg 1984; 119: 369-74.
3. Krause R. Reintervention in abdominal surgery. World J Surg 1987; 11: 226-32.
4. Fry DE, Garrison RN, Heitsch RC, Calhoun K, Polk HC Jr. Determinants of death in patients with intraabdominal abscess. Surgery 1980; 88: 517-23.
5. Dellinger EP, Wertz MJ, Meakins JL, Solomkin JS, Allo MD, Howard RJ, et al. Surgical infection stratification system for intra-abdominal infection. Multicenter trial. Arch Surg 1985; 120: 21-9.
6. Levy E, Palmer DL, Frileux P, Hannoun L, Nordlinger B, Tiret E, et al. Septic necrosis of the midline wound in postoperative peritonitis. Successful management by debridement, myocutaneous advancement, and primary skin closure. Ann Surg 1988; 207: 470-9.
7. Stone HH, Fabian TC, Turkleson ML, Jurkiewicz MJ. Management of acute full-thickness losses of the abdominal wall. Ann Surg 1981; 193: 612-8.
8. Kendrick JH, Casali RE, Lang NP, Read RC. The complicated septic abdominal wound. Arch Surg 1982; 117: 464-8.
9. Wouters DB, Krom RA, Slooff MJ, Kootstra G, Kuijjer PJ. The use of Marlex mesh in patients with generalized peritonitis and multiple organ system failure. Surg Gynecol Obstet 1983; 156: 609-14.
10. Voyles CR, Richardson JD, Bland KI, Tobin GR, Flint LM, Polk HC Jr. Emergency abdominal wall reconstruction with polypropylene mesh: short-term benefits versus long-term complications. Ann Surg 1981; 194: 219-23.
11. Dayton MT, Buchele BA, Shirazi SS, Hunt LB. Use of an absorbable mesh to repair contaminated abdominal-wall defects. Arch Surg 1986; 121: 954-60.
12. Greene MA, Mullins RJ, Malangoni MA, Feliciano PD, Richardson JD, Polk HC Jr. Laparotomy wound closure with absorbable polyglycolic acid mesh. Surg Gynecol Obstet 1993; 176: 213-8.
13. Sriussadaporn S, Pak-Art R, Bunjongsat S. Immediate closure of the open abdomen with bilateral bipedicle anterior abdominal skin flaps and subsequent retrorectus prosthetic mesh repair of the late giant ventral hernias. J Trauma 2003; 54: 1083-9.
14. Sriussadaporn S, Sriussadaporn S, Kritayakirana K, Pak-Art R. Operative management of small bowel fistulae associated with open abdomen. Asian J Surg 2006; 29: 1-7.
15. Fabian TC, Croce MA, Pritchard FE, Minard G, Hickerson WL, Howell RL, et al. Planned ventral

hernia. Staged management for acute abdominal wall defects. Ann Surg 1994; 219: 643-53.
16. Gerzof SG, Robbins AH, Birkett DH, Johnson WC, Pugatch RD, Vincent ME. Percutaneous catheter drainage of abdominal abscesses guided by ultrasound and computed tomography. AJR Am J Roentgenol 1979; 133: 1-8.
17. Wittmann DH, Schein M, Condon RE. Management of secondary peritonitis. Ann Surg 1996; 224: 10-8.
18. Ogilvie WH. The late complications of abdominal war-wounds. Lancet 1940; 2: 253-6.
19. Ramirez OM, Ruas E, Dellon AL. "Components separation" method for closure of abdominal-wall defects: an anatomic and clinical study. Plast Reconstr Surg 1990; 86: 519-26.
20. Shestak KC, Edington HJ, Johnson RR. The separation of anatomic components technique for the reconstruction of massive midline abdominal wall defects: anatomy, surgical technique, applications, and limitations revisited. Plast Reconstr Surg 2000; 105: 731-8.
21. Schein M. Intestinal fistulas and the open management of the septic abdomen. Arch Surg 1990; 125: 1516-7.
22. Bosscha K, Hulstaert PF, Visser MR, van Vroonhoven TJ, van der Werken C. Open management of the abdomen and planned reoperations in severe bacterial peritonitis. Eur J Surg 2000; 166: 44-9.
23. Scott BG, Welsh FJ, Pham HQ, Carrick MM, Liscum KR, Granchi TS, et al. Early aggressive closure of the open abdomen. J Trauma 2006; 60: 17-22.
24. de Moya MA, Dunham M, Inaba K, Bahouth H, Alam HB, Sultan B, et al. Long-term outcome of acellular dermal matrix when used for large traumatic open abdomen. J Trauma 2008; 65: 349-53.
25. Jamshidi R, Schecter WP. Biological dressings for the management of enteric fistulas in the open abdomen: a preliminary report. Arch Surg 2007; 142: 793-6.
26. Schuster R, Singh J, Safadi BY, Wren SM. The use of acellular dermal matrix for contaminated abdominal wall defects: wound status predicts success. Am J Surg 2006; 192: 594-7.
27. Kim H, Bruen K, Vargo D. Acellular dermal matrix in the management of high-risk abdominal wall defects. Am J Surg 2006; 192: 705-9.

การใช้ตาข่ายสังเคราะห์ชนิดละลายได้ปิดหน้าท้องในผู้ป่วยที่ได้รับการผ่าตัดช่องท้องซ้ำ เนื่องจากมีการติดเชื้อรุนแรงภายหลังการผ่าตัดช่องท้องครั้งแรก

สุวิทย์ ศรีอัษฎาพร, สุกัญญา ศรีอัษฎาพร, รัฐพลี ภาคอรรถ, กฤตยา กฤตยากีรณ, ศุภฤกษ์ ปรีชายุทธ

วัตถุประสงค์: *เพื่อศึกษาถึงผลของการใช้ตาข่ายสังเคราะห์ชนิดละลายได้ในผู้ป่วยที่ต้องรับการผ่าตัดซ้ำ เนื่องจากภาวะติดเชื้อในช่องท้อง และหรือที่แผลผ่าตัดภายหลังการผ่าตัดครั้งแรก*

วัสดุและวิธีการ: *เป็นการศึกษาย้อนหลังในผู้ป่วยที่ต้องรับการผ่าตัดซ้ำ เนื่องจากภาวะติดเชื้อในช่องท้องและหรือที่แผลผ่าตัดภายหลังการผ่าตัดครั้งแรก และได้รับการปิดแผลหน้าท้องด้วยตาข่ายสังเคราะห์ชนิดละลายได้ที่โรงพยาบาลจุฬาลงกรณ์ ตั้งแต่วันที่ 1 มกราคม พ.ศ. 2547 ถึงวันที่ 30 กันยายน พ.ศ. 2552 ข้อมูลที่ศึกษา ได้แก่ ข้อบ่งชี้ของการผ่าตัดซ้ำ, ชนิดของตาข่ายสังเคราะห์ชนิดละลายได้ที่ใช้, ผลการรักษา และการติดตามผู้ป่วยหลังจากออกจากโรงพยาบาล*

ผลการศึกษา: *มีผู้ป่วยในรายงานนี้ 12 ราย ผู้ป่วย 6 ราย ได้รับการปิดแผลหน้าท้องด้วยตาข่ายสังเคราะห์ชนิดละลายได้ชนิด polyglycolic acid หรือ dexon และอีก 6 ราย ได้รับการปิดด้วยตาข่ายสังเคราะห์ ชนิดละลายได้ชนิด polyglactin หรือ vicryl แผลหน้าท้องหายโดยการทำ skin graft ในผู้ป่วย 5 ราย (ร้อยละ 41.7), โดยการทำ skin flaps ในผู้ป่วย 1 ราย (ร้อยละ 8.3), โดยการปล่อยให้หายเอง 5 ราย (ร้อยละ 41.7) และโดยการใช้ human acellular dermal matrix และ skin graft 1 ราย (ร้อยละ 8.3) ผู้ป่วย 1 ราย (ร้อยละ 8.3) เกิดภาวะแทรกซ้อน enterocutaneous fistular ไม่มีผู้ป่วยรายใดเสียชีวิตระยะเวลาพักรักษาตัวอยู่ในโรงพยาบาลอยู่ระหว่าง 17 ถึง 201 วัน (เฉลี่ย 118 วัน)*

สรุป: *การใช้ตาข่ายสังเคราะห์ชนิดละลายได้ในผู้ป่วยที่ได้รับการผ่าตัดซ้ำ เนื่องจากภาวะติดเชื้อในช่องท้องและหรือแผลผ่าตัดติดเชื้อภายหลังการผ่าตัดครั้งแรกเป็นวิธีที่ดีวิธีหนึ่งที่ศัลยแพทย์อาจพิจารณาเลือกเอามาใช้ เมื่อพบผู้ป่วยหนักที่ต้องรับการผ่าตัดช่องท้องซ้ำ และไม่สามารถปิดหน้าท้องแบบปกติได้อย่างปลอดภัย หัตถการนี้จะช่วยประคับประคองให้ผู้ป่วยรอดชีวิตไปก่อน ถึงแม้ส่วนใหญ่จะต้องได้รับการผ่าตัดซ่อมแซมไส้เลื่อนขนาดใหญ่ของผนังหน้าท้องในเวลาต่อมาก็ตาม*