

Successful Closure of a Persistent Enterocutaneous Fistula with a Myocutaneous Flap

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Enterocutaneous fistulas can present with significant morbidity and mortality for affected patients, as the abnormal connection can result in exorbitant loss of enteral fluids, electrolyte disturbances, and sepsis, among other complications. We present a patient with a chronic complex enterocutaneous fistula who underwent several surgeries, resulting in a considerable amount of bowel resection. Based on history and findings of high output fistula with diverting transverse colostomy, the fistula was closed with a left rectus myocutaneous pedicle flap to avoid entering the abdominal cavity and prevent the possibility of short bowel syndrome. This case contributes to the growing body of literature supporting the use of rectus myocutaneous flaps for the closure of intractable complex enterocutaneous fistulas in patients unable to undergo resection of the affected bowel. [P R Health Sci J 2023;42(4):322-324]

Key words: Enterocutaneous fistula, Surgery, Myocutaneous flap

Enterocutaneous fistulas present with significant morbidity and mortality for affected patients. Possible complications include loss of enteral fluids, sepsis, and electrolyte abnormalities, among others. A fistula is considered complex when connective tissue and abdominal musculature separating the skin and intestinal tract is lost. Such distinction is made because it represents an additional obstacle towards healing, since these fistulas rarely resolve spontaneously, and the lost tissue is generally essential to close the lesion. Patients with high-output fistulas are faced with mortalities ranging from 5.3% to 35% (1), for which prompt resolution should be a main objective. We present a patient whose intractable complex enterocutaneous fistula was repaired by implementing a left rectus myocutaneous pedicle flap, obviating need for entering abdominal cavity.

Case Report

A 44-year-old female with a history of Type 2 diabetes, hypercholesterolemia, Factor V Leiden mutation, depression, and obesity status post bariatric surgery presented with chronic abdominal pain secondary to adhesions. The patient's past surgical history includes a Roux-en-Y bariatric surgery (2012), ventral hernia repairs (2013, 2014), a cholecystectomy, and an appendectomy. Exploratory laparotomy (ELAP) with lysis of adhesions, small bowel resection, enterorrhaphy and strictureplasty was performed in January 2021 to address symptoms. One month after surgery, the patient presented with an enterocutaneous (EC) fistula at the distal jejunum. The patient underwent surgery for fistula repair with resection and primary anastomosis as well as an upper midline transverse

colostomy placement using the site of a second fistula in the transverse colon. Eight months following the ELAP, the transverse colostomy was not adequately producing output, and presence of the high-output fistula in the distal jejunum was confirmed by fistulogram. She reported persistent, intense abdominal pain that was relieved with passage of gas and was associated with nausea. A weight loss of 70 lbs. was reported during that time frame. Through her prolonged hospital stay, the patient developed severe depression and anxiety, for which psychiatry services were consulted. They determined her symptoms were due to medical conditions. Alternatives for fistula closure were explored in hopes of improving the patient's quality of life. Given a hostile intraabdominal cavity and possibility of short bowel syndrome, the decision was made to perform closure of fistula by reconstructing the anterior wall of intestinal tract with a muscle flap. Prior to the procedure, the patient was receiving TPN and was medically and nutritionally optimized to reduce risk of wound healing complications.

Markings around the fistula and left rectus flap were made such that the skin island's diameter was 20% larger than the fistula. A left lateral abdominal incision was made where tissue was dissected using cautery until abdominal wall fascia was found and opened. Rectus muscle was found and dissected,

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preserving irrigation by muscle perforators. The rectus muscle was transected cranially and dissected caudally until arc of rotation for coverage of fistula was obtained without tension. Blade and cautery were used in creation of circular incision surrounding the fistula. A Foley catheter was placed at the proximal limb of the fistula for drainage. Flap advancement was sutured in place via internal layer between skin island from flap and internal aspect of skin surrounding the fistula with interrupted stitches. The external layer of dermis of skin island, rectus muscle, and external aspect of incision surrounding fistula were closed using interrupted simple and horizontal mattress stitches. Foley catheter was sutured in place. One drain was placed, exteriorized at left inguinal area. The abdominal wound was closed in a layered fashion with deep dermal interrupted stitches and running sutures. The reversed flap and abdominal incision were covered and treated with local wound care, healing by secondary intention. There were no complications during the procedure.

The postoperative course was unremarkable. The patient remained on TPN and bowel rest until postoperative day #16, when a clear liquid diet was started. Diet was tolerated, and eventually progressed to a regular diet with no complications. The colostomy was functioning adequately after the procedure, and the foley placed on the fistula site showed progressively decreasing output. Patient was discharged on postoperative day #25 and has been receiving regular follow up. Nine months following repair, the flap has been healing steadily, with no evidence of flap failure, infection, or fistula recurrence.

Discussion

Enterocutaneous fistulas typically arise from abdominal surgery, trauma, or infection, and treatment is often stymied by patient comorbidities. Studies have demonstrated that high output enterocutaneous fistulas, defined as those with an output greater than 500 mL/day, are associated with a significantly increased risk of recurrence and are unlikely to resolve on their own (2). High-output enterocutaneous fistulas require prolonged, multidisciplinary management. In this case, additional operative management with resection and anastomosis had been unsuccessful, as the fistula had recurred. The patient's surgical history made her abdominal cavity extremely hostile. Moreover, further small bowel resections increase her risk for short bowel syndrome.

Repair of enterocutaneous fistulas with myocutaneous rectus abdominis flap has been performed successfully in a handful of cases. Nonetheless, the procedure had not been attempted in a patient with such an extensive history of abdominal procedures and with a Factor V Leiden mutation, which has been associated with an increased risk of microvascular complications and flap failures (3). At the moment, the patient's myocutaneous flap is healing adequately with minimal drainage from the foley placed in the fistula site. There is no evidence of fistula recurrence and the patient's symptoms have markedly improved.

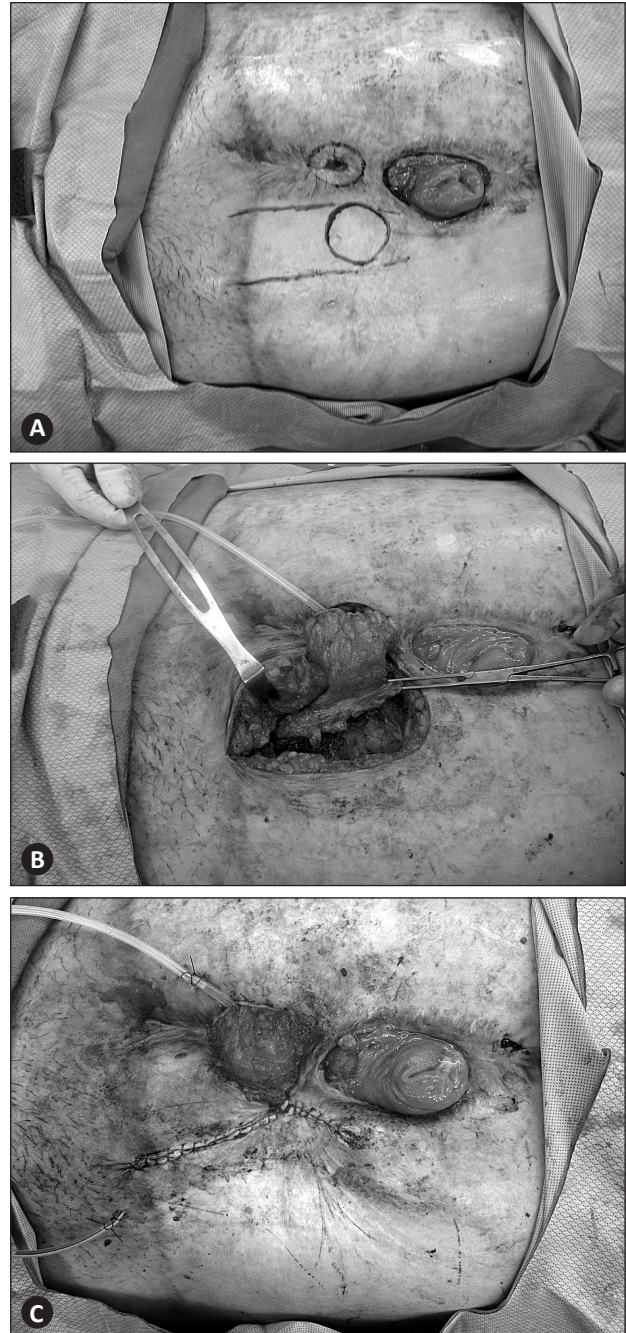


Figure 1. A) Preoperative findings. Enterocutaneous fistula visualized and circled. Area to be used for pedicle flap also highlighted. B) Mobilized pedicle flap during the procedure. C) Completed procedure. Closed fistula site on right side of abdomen. Diverting colostomy on the left.

Indications for repairing enterocutaneous fistulae with pedicled rectus muscle flaps include persistent patency following conservative management, failure of traditional surgical approaches, and sustained electrolytic and nutritional abnormalities (4). Although previous studies have reported successful attempts at repairing complex abdominal and pelvic wounds with rectus myocutaneous flaps (4,5,6), the patient

population is heterogeneous. Therefore, issues surrounding the replication of this procedure may arise. The complexity of our case highlights the safety and efficacy of this approach and adds to the growing body of literature that underscores the potential of rectus flaps for fistula repair. Further reports of successful attempts at repairing enterocutaneous fistula using vascularized muscle flaps are needed to obtain sufficient pooling of raw patient data for adequately powered statistical analysis (7). By doing so, a standardized approach to enterocutaneous fistulae repair using pedicled rectus muscle flaps can be developed.

Conclusion

The use of pedicled rectus myocutaneous flaps for enterocutaneous fistula repair has been reported in a handful of cases with varying degrees of complexity. This case suggests the use of this procedure is can be considered when indications are met, even in patients that are predisposed to microvascular complications and flap failure. This report lends credence to the use of vascularized muscle flaps as a viable option for intractable enterocutaneous fistula repair, even when multiple comorbidities are present.

Resumen

Las fistulas enterocutáneas pueden presentar morbilidad y mortalidad significativas para los pacientes afectados, ya que esta conexión anormal puede provocar una pérdida exorbitante de líquidos enterales, alteraciones electrolíticas y sepsis, entre otras complicaciones. En este reporte mostramos a una paciente con una fistula enterocutánea compleja crónica que fue sometida a varias cirugías, resultando en una cantidad considerable de resección intestinal. Basado en el historial médico y el hallazgo de una fistula de alta salida con colostomía transversa, la fistula

se cerró con un colgajo pediculado miocutáneo del músculo recto izquierdo para evitar ingresar a la cavidad abdominal y prevenir la posibilidad de síndrome de intestino corto. Este caso contribuye al creciente cuerpo de literatura que respalda el uso de colgajos miocutáneos para el cierre de fistulas enterocutáneas complejas intratables en pacientes que no pueden someterse a una resección del intestino afectado.

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