# MANAGEMENT OF ENTEROCUTANEOUS FISTULA pdf

## 1: Managing Complex, High-Output, Enterocutaneous Fistulas: A Case Study | Ostomy Wound Manageme

*A fistula is an abnormal communication between 2 epithelialized surfaces, with an enterocutaneous fistula (ECF) being an abnormal communication between the small or large bowel and the skin. An ECF can arise from the duodenum, jejunum, ileum, colon, or rectum.*

This article has been cited by other articles in PMC. Abstract Enterocutaneous EC fistula is an abnormal connection between the gastrointestinal GI tract and skin. The majority of EC fistulas result from surgery. About one third of fistulas close spontaneously with medical treatment and radiologic interventions. Surgical treatment should be reserved for use after sufficient time has passed from the previous laparotomy to allow lysis of the fibrous adhesion using full nutritional and medical treatment and until a complete understanding of the anatomy of the fistula has been achieved. The successful management of GI fistula requires a multi-disciplinary team approach including a gastroenterologist, interventional radiologist, enterostomal therapist, dietician, social worker and surgeons. With this coordinated approach, EC fistula can be controlled with acceptable morbidity and mortality. The incidence of traumatic EC fistula has been increasing due to the higher incidence of damage control surgery performed for major trauma 3. EC fistulas are associated with significant morbidity and mortality. Patients with EC fistula are faced with the burden of overcoming septic complications resulting from early intra-abdominal infection, fluid electrolyte imbalance and malnutrition. The goals of EC fistula management are to restore gastrointestinal GI continuity and allow enteral nutrition with minimal morbidity and mortality. A step-by-step approach is recommended to achieve these goals. Management of EC Fistulas Recognition and Stabilization of EC Fistula The initial stage of EC fistula management consists of its identification, followed by general supportive care with fluid and electrolyte replacement, control of sepsis, nutritional support and control of fistula drainage by pharmacologic means as well as through skin protection. Once a postsurgical or spontaneous EC fistula is identified, obtaining anatomic information is of the utmost importance to predict the site of intestinal opening and assess the need for surgery. In contrast, gastric, lateral duodenal, ligament of Treitz, and ileal fistulas are less likely to close spontaneously 4. The presence of any FRIEND component in EC fistula is an indication for surgical intervention; however, surgery should be performed only after sufficient time has been afforded to restore overall patient condition and allow lysis of the intra-abdominal fibrous adhesions from previous operations. Fistula output fluids rich in electrolytes, minerals and protein cause electrolyte imbalance and malnutrition. Fluid replacement therapy is therefore the first step in the management of patients with EC fistulas. Crystalloid, colloid solutions and blood transfusions are generally required during early resuscitation. After initial resuscitation, septic complications need to be controlled. Treatment is comprised of intra-abdominal infection control with antibiotics, computed tomography CT -guided drainage or sometimes open drainage for a "controlled fistula". A controlled fistula refers to an EC fistula without evidence of sepsis high fever, rigors, and hypotension , or localized infection cellulitis, pneumonia 5. If the intestinal contents drain out through the matured tract, there is no longer intraperitoneal contamination or fluid accumulation to cause septic problems. Sufficient parenteral or enteral nutritional support should be provided when the septic problems are under control. Parenteral nutrition has been shown to affect the spontaneous closure of EC fistulas 5 - 8. Recently, enteral feeding was found to have a protective effect on the mucosal barrier and immunologic function of the bowel, even in patients with high-output EC fistulas 9. Enteral feeding also improves hepatic protein synthesis. These advantages suggest that early enteral feeding with the combination of parenteral nutrition is a key component of nutritional support in patients with EC fistulas. A regular supplementation of trace minerals such as copper, zinc, and a vitamin complex is generally recommended. A fistula output greater than mL per day is classified as a high-output fistula and less than mL is classified as a low-output fistula. Fistula output is a significant single prognostic factor for determining the possibility of spontaneous closure and mortality 9 - Control of output is therefore also very important in achieving spontaneous closure. Traditionally, NPO and nasogastric suction have been used to decrease output, but there is little evidence to support the effectiveness of these strategies. H2-receptor antagonists and proton pump inhibitors are recommended to control fistula

output. Somatostatin and its analog, octreotide, inhibit endocrine and exocrine secretion in the GI tract. Recent randomized trials did not consistently show a positive effect of octreotide on fistula closure or a reduction in fistula output 12 - High doses of antimotility drugs such as loperamide up to 36 mg daily and codeine phosphate up to mg daily are also used to decrease fistula output Because the small bowel contents that drain from an EC fistula are rich in digestive enzymes and electrolytes, skin protection is a crucial step in wound management. It also aids in the secure closure of the abdomen when surgery is mandatory to control the fistula. Skin should be protected from maceration and breakdown when stoma appliances and protective films are used. Several studies of vacuum-assisted closure VAC reported successful closure of EC fistulas 2 , 5 , 17 , but the main advantages of VAC is skin protection and ease of dressing Figs. Fibrin glue has also been introduced to close EC fistulas, but the success of the study was not definitive due to the small sample size

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## 2: Surgical Management of Enterocutaneous Fistula

*The therapeutic goals of management for the patient with an enterocutaneous fistula are to promote spontaneous fistula closure or, where this is not possible, to restore and maintain body composition and physiological function so that the patient is optimally prepared for definitive surgery to resect the fistula and, if possible, restore intestinal continuity.*

It is often accompanied by intra-abdominal abscesses. Aetiology Most cases develop following surgery for inflammatory bowel disease, cancer or lysis of adhesions. These complications usually occur in patients who are poorly prepared or who have had radiation therapy, with emergency surgery or because of poor surgical judgement. Anastomotic breakdown, sepsis and traumatic enterotomy are common predisposing factors. Malnutrition is also an important contributing factor. Some of the complications of enterocutaneous fistulas are listed in Complications of enterocutaneous fistulas. Complications of enterocutaneous fistulas Electrolyte disturbances. These usually involve potassium, sodium, magnesium and, especially when parenteral nutrition is used, phosphate. This is most common with high-output fistulas and when there is severe sepsis. This is commonly associated with anastomotic leaks, and intra-abdominal and pelvic abscesses from enteric contamination. Cutaneous sepsis from irritation of the abdominal wall by the enteric effluent is also common. Classification Enterocutaneous fistulas are classified in the following manner: Moderate- or high-output fistulas are usually related to the small bowel. Higher-output fistulas are more prone to electrolyte imbalance and malnutrition. The site of origin in the gastrointestinal tract is also helpful in the prediction of its outcome. Diagnosis and medical management In the usual setting in which fistulas develop post-operatively, the patient will have done poorly for 5 or 6 days. There is often fever and persistent ileus. A wound abscess appears and is drained. Within the next 24 hours, intestinal contents appear from the wound. By that stage, the patient is often dehydrated, anaemic and malnourished. Optimisation of the patient follows the following schema. Nutritional support Adequate nutritional repletion and bowel rest may allow spontaneous closure of a fistula. Unless there is prominent paralytic ileus or the fistula arises from a proximal part of the gastrointestinal tract, enteric nutritional support is encouraged because it provides some of the immunological and other hormonal functions of the gut. However, adequate caloric and nitrogen support with enteral nutrition is usually not possible for 4 or 5 days after its implementation. Supplementation with parenteral nutrition through a central venous line is helpful. Enteric support requires the presence of approximately cm of small bowel. If enteric nutrition is provided through the stomach, the osmolarity is increased first until hyperosmolarity is tolerated, followed by an increase in volume. If enteric support is provided directly into the small bowel, the volume should be increased first and then osmolarity. The small bowel does not tolerate hyperosmolar solutions well. Enteric nutritional support tends to increase fistula drainage, at least initially. Provision of parenteral nutrition may be established as an elective procedure to provide bowel rest and maintain nutrition. Whenever possible, parenteral nutrition should be deferred until major sepsis is contained because haematogenous seeding of the central venous catheter may occur with repeated bacteraemia or septicaemia. Management of fluid and electrolytes The amount of fistula drainage is carefully quantified so that fluid balance is achieved. In most cases electrolytes may be adequately replaced in the parenteral nutrition solution. A large amount of sodium is lost in proximal enteric fistulas. Acid-base balance must be carefully monitored in these difficult cases. Control of fistula drainage Bowel rest Complete bowel rest is useful in the initial management until stabilisation and evaluation is complete, especially if there is underlying sepsis and the fistula output is high. Gradually, enteric nutrition can be initiated. The placement of a decompressive tube, either nasogastric or long gastrointestinal, should be avoided unless severe paralytic ileus or mechanical obstruction is present. The presence of an indwelling nasogastric tube for a prolonged period is not only uncomfortable for the patient but may result in pneumonia, reflux oesophagitis and serous otitis media. If long-term decompression is thought to be necessary, a gastrostomy tube is preferred. Somatostatin Somatostatin analogues such as sandostatin reduce fistula output, facilitate skin care and may contribute to the closure of fistulas, especially those of biliary or pancreatic origin. H2 antagonists These decrease gastric secretion and may prevent bleeding from gastric stress ulceration. On their own, they have little impact on fistula output. Skin care With higher fistula output,

care of the skin surrounding the fistula is best accomplished by sump drainage of the fistula and application of various skin-protective preparations. Care is taken to avoid skin maceration, cellulitis and cutaneous necrosis. When this occurs, subsequent surgical therapy is more difficult. An enterostomal therapist should be involved with the care of these patients. Control of sepsis If there is clinical evidence of sepsis with swinging fever and leucocytosis, broad-spectrum antibiotics covering Gram-negative organisms and anaerobes are prescribed after preliminary work-up for sepsis i. Use of antibiotics should be judicious and guided by the cultures and sensitivity studies. Computed tomography CT scans are useful in detecting closed-space infection and abscesses that are amenable to percutaneous drainage, guided by CT or ultrasonography. Uncontrolled sepsis remains the major cause of mortality in these patients. Sometimes an exploratory laparotomy may be performed to drain abscesses that are not accessible to percutaneous drainage. General management The process of recovery from enterocutaneous fistula may be protracted and the patient may need several operations. Because most fistulas will heal spontaneously it is important to maintain good morale from the outset. Ambulation is maintained to avoid thromboembolic complications. In less ambulant patients, compressive stockings and subcutaneous heparin prophylaxis are prescribed. Investigation After the initial 48 hours most patients will have stabilised enough to allow investigation and definition of the fistula. Radiological investigations are usually the most important step in defining the anatomy of the fistula. Collaboration between the surgeon and radiologist is important for optimal management. Computed tomography scan Computed tomography scan determines whether there are any drainable septic collections. Because the presence of contrast in the bowel or in the peritoneal cavity will distort CT images, whenever possible the CT scan should be done prior to other contrast examinations. Sinography The fistula orifice is cannulated with a small feeding tube or catheter, and the water-soluble contrast such as gastrografin is injected through the tube. The following information is sought: Contrast small bowel follow-through or contrast enema Contrast small bowel follow-through or contrast enema provides information on the underlying bowel and demonstrates the presence of intestinal obstruction distal to the fistula. The fistulas may not be visualised as clearly as in a sinogram. Treatment The aim of therapy is to restore intestinal continuity enabling the patient to take nutrition orally. This is best achieved by spontaneous closure. However, in complicated fistulas, this occurs only in approximately onethird of patients. The following factors are important for clinical decision making. Fistula drainage Usually fistula output decreases with bowel rest and total parenteral nutrition. If it does not decrease, surgery will probably be required. If the fistula output has not reduced markedly after a 4â€”5-week period without sepsis and with adequate nutritional support, it is unlikely that the fistula will close spontaneously. Nature of fistula The site of the fistula is important. Ileal and gastric fistulas are less likely to undergo spontaneous closure than lateral oesophageal, lateral duodenal and jejunal fistulas, or pancreatic and biliary fistulas Adverse factors to spontaneous closure of fistulas. Adverse factors to spontaneous closure of fistulas Loss of intestinal continuity e. Persistent intestinal obstruction distal to the fistula. Large adjacent abscess cavity. Presence of a foreign body e. Epithelialisation of the fistula. In these circumstances, the fistula is allowed to heal and surgery is then performed with a formal resection and end-to-end anastomosis. Fistulas occurring in association with a carcinoma should be resected whenever feasible. General condition of the patient In patients who are severely malnourished with significant co-morbid factors, a period of non-operative management is preferred. If severe sepsis is present, salvage procedures that include drainage of abscesses and proximal diversion, with or without resection of the phlegmon, are indicated. A macerated abdominal wall further affects the surgical outcome adversely. In most cases, a period of bowel rest and total parenteral nutrition is indicated to restore nutritional balance and to allow for healing of the skin surrounding the fistula. Following recent surgery and the fistulising process, dense peritoneal reaction in the form of obliterative peritonitis is commonly encountered. Thus, definitive surgery is best deferred for at least 4 months to allow resolution of this peritoneal reaction. Operative therapy Prevention Because most fistulas follow surgical mishaps, the foremost principle in management is prevention. This may be accomplished by adherence to strict surgical principles in performing intestinal anastomosis and sepsis prevention. Salvage procedures Sometimes early surgical intervention is necessary because of uncontrolled sepsis or a high fistula output, despite the poor general condition of the patient. The surgical procedures include: Operations for fistulas are

not to be taken lightly and require meticulous planning. If a recent surgery has been performed, an interval of at least 3â€”4 months should elapse before the definitive surgery. Pre-operative preparations include appropriate bowel preparation, prophylaxis for deep vein thrombosis and adequate nutritional repletion. Samples from the fistula site and wound should be cultured and sensitivities obtained to guide the antibiotic prophylaxis. Blood should be cross-matched. The stoma site should be marked pre-operatively and its possibility discussed with the patient. The operation should be performed through an adequately healed abdominal wall in which a secure abdominal closure can be obtained.

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## 3: Enterocutaneous Fistula | Conditions & Treatments | UCSF Medical Center

*Management of Enterocutaneous Fistula Kelley A. Sookraj, MD Kings County Hospital Center August 25th www.enganchecubano.com â€¢ CC: drainage of fluid and air from umbilicus.*

Most ECFs were referred to us from outside institutions  Successful ECF closure was ultimately achieved in patients  Postoperative complications occurred in patients, for an overall morbidity rate of  Significant risk factors for fistula recurrence were numerous, but postoperative ventilation for longer than 48 hours, organ space surgical site infection, and blood transfusion within 72 hours of surgery carried the most considerable impact relative risks, 4. Risk of 1-year mortality was also associated with multiple risk factors, the most substantial of which were postoperative pulmonary and infectious complications. Closure of abdominal fascia was protective against both recurrent ECF and mortality relative risks, 0. Closure of abdominal fascia is of utmost importance, and preventing postoperative complications must be prioritized to optimize patient outcomes. Enterocutaneous fistula ECF is defined as an abnormal connection between the gastrointestinal tract and the skin, and it requires labor-intensive medical management and surgical expertise. Complex wound management, severe malnutrition, frequent infectious complications,chronic pain, and depression require significant investment of health care resources and make the short-term and long-term care of these patients difficult. The subsequent operative management often requires lengthy procedures in hostile abdomens with abundant adhesions and surrounding inflammation. In addition to the significant risk of mortality, morbidity can be equally as devastating. Case series within the literature are limited, often involving small cohorts receiving surgical intervention from multiple surgeons and multiple institutions, thus allowing for uncontrolled differences in preoperative preparation, operative technique and skill level, and postoperative care and wound management. This study aims to investigate the outcomes following surgical ECF management by a multidisciplinary team under the leadership of the same surgeon J. Methods Patients Emory University Hospital is a bed adult tertiary care facility where ECF treatment is orchestrated by a surgical team under the direction of a single surgeon J. Quiz Ref ID We retrospectively reviewed medical records of patients from December 24, , to June 18, , who received definitive surgical treatment for ECF originating from the stomach, small bowel, colon, and rectum. Patients with esophageal, biliary, pancreatic, enterovaginal, enterovesicular, and anal fistulas were excluded from our review. Definitive surgical treatment was defined as an operative procedure in which the segment of stomach or bowel containing the ECF was either oversewn or resected in its entirety with the intention of closing a fistulous tract. Thorough preoperative, intraoperative, and postoperative data were meticulously extracted from patient records. The eAppendix includes a complete list of all data points obtained. The data set was incomplete for some patients and is noted accordingly in results when appropriate. Fistula categories used within this series are based on difficulty in stoma or wound care and were first described this way by Irving and Beadle 11 and Irving. The cause of the ECF was determined from medical records. In most cases, the cause was limited to 1 factor; however, there were several cases in which the cause was multifactorial. We followed the standardized definitions of complications used by the National Surgical Quality Improvement Program.

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## 4: Fistula Management | Nurse Key

*Enterocutaneous Fistula Management. Perhaps one of the most challenging patient care situations that a wound, ostomy, and continence (WOC) nurse can encounter is the management and treatment of an enterocutaneous fistula.*

An enterocutaneous fistula ECF refers to an opening from the intestine to the skin. Although ECFs can be located within a wound, they should not be confused with a draining wound, surgically placed drain site, or wound dehiscence. The mortality rates for patients with ECFs range from as low as 5. Although the true incidence of ECF development is unknown, Teixeira et al. They also found that patients with ECFs required significant hospital resources with a statistically significant increase in intensive care unit length of stay Other team members include pain specialists, radiologists, physiotherapists, and occupational therapists Lal et al. The definitive indicator of a cutaneous fistula is the passage of gastrointestinal GI secretions or urine into an open wound bed or through an unintentional opening onto the skin. Irradiation-induced rectovaginal fistulas often are preceded by diarrhea, passage of mucus and blood rectally, a sensation of rectal pressure, and a constant urge to defecate Saclarides, Fistulas between the intestinal tract and the urinary bladder e. The pH of the effluent may suggest the origin of the fistula tract. For example, extremely acidic fluid pH 1. Most clinicians describe and classify fistulas according to location, involved structures, and volume of effluent. Although less frequently used, fistulas may also be classified by complexity see Table Mucous fistulas are surgically created openings into the defunctionalized section of bowel; they secrete mucus only, which is relatively easy to contain with dressings or pouches, and they do not increase morbidity or mortality. They are therefore not further discussed in this chapter. Management of draining wounds and fistulas. Current management concepts 5th ed. Etiologic Factors ECFs commonly develop postoperatively, due to anastomotic breakdown, but can also occur spontaneously, as a result of inflammatory bowel disease, cancer, or diverticulitis. Spontaneous fistulas are generally resistant to spontaneous closure. Additional risk factors for postoperative ECF development include existing conditions such as inflammatory bowel disease, cancer, or previous radiation therapy. Surgery-related risk factors include inadequate blood supply, poor suture technique, inadequate bowel prep e. The method of anastomosis stapled or hand-sewn has not proven to be a predictor of ECF after surgery for trauma Demetriades et al. Patients scheduled for elective surgical procedures should receive adequate nutrition preoperatively in order to minimize the risk of anastomotic breakdown. If there are concerns regarding delayed healing of the intestinal anastomosis due to poorly controlled morbidities and extensive intra-abdominal infection, a temporary stoma may be created proximal to the anastomosis to protect the anastomosis during healing; the stoma is closed once healing is complete. In the past, temporary stomas were commonly performed following bowel resection and anastomosis due to traumatic injury; this is no longer standard, as most of these anastomoses have been shown to heal in a timely manner. Interestingly, recent studies indicate that diversion following colonic anastomosis for penetrating colonic injury did not reduce the incidence of septic complications, including abscess and fistula Demetriades et al. Medical Management Management for this patient population requires a clear understanding of the underlying pathophysiology, astute assessment skills, knowledge about management alternatives and options, competent technical skills, diligent follow-up, and persistence. Spontaneous closure of an ECF is defined as closing with medical management within 6 to 8 weeks Teixeira et al. Additional factors that correlate with spontaneous closure include postoperative occurrence, low output, absence of sepsis, and adequate nutrition Campos et al. Objectives of ECF management are described below and include: Maintenance of Fluid and Electrolyte Balance Each day 8 to 10 L of fluid flows through the jejunum, depending on oral intake. Development of a fistula permits abnormal fluid losses, with volume of loss determined in part by size of the fistulous opening and in part by anatomic location within the bowel. For example, fistulas located in the proximal small bowel are generally high output, while fistulas occurring in the colon are typically low output. When providing fluid replacement, the prescribing provider must consider both the volume and the composition of the fistulous drainage, both of which are impacted by fistula location within the GI tract. Careful monitoring of tissue perfusion, weight, urine, and fistula output is necessary to evaluate fluid balance.

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Adequate fluid and electrolyte replacement is critical to prevent hypovolemia and circulatory failure in the patient with a high-output ECF Makhdoom et al. Measures to Minimize Fistula Output A key intervention for promotion of spontaneous closure is to minimize the amount of fluid flowing through the fistula tract, that is, to reduce oral and enteral intake. Administration of H2 antagonists e. Somatostatin and its analog, octreotide, are known to decrease intestinal output in some situations, and have been used as adjunctive therapy in the treatment of ECF. Somatostatin is administered through continuous intravenous infusion due to its short half-life of 1 to 2 minutes. More recently, a systematic review and meta-analysis conducted by Coughlin et al. Octreotide is not recommended for routine use due to reports of precipitated villous atrophy, interruption of intestinal adaptation, and acute cholecystitis. Some authors recommend a 5- to 8-day trial, with discontinuation of the octreotide if there is no significant reduction in fistula output within that time frame Draus et al. Symptoms may include localized and then diffuse abdominal pain, ileus, and fever. Presence of abscess can be detected with computed tomographic scanning or ultrasound. CT-guided drainage is the initial management of choice in patients presenting with spontaneous or postoperative intra-abdominal abscess. This can obviate the need for early operative intervention. As seen in Figure , if a fistula develops, a definitive procedure can be deferred with the drain left in place to control further abscess formation Davis et al. Abscess contents should be cultured after percutaneous or surgical drainage, to assure appropriate antibiotic therapy Wong et al. ECF small bowel to skin ; extensive skin damage due to enzymatic drainage; drain in place for abscess management. Definition of the Fistula Tract Once the patient is stabilized, definition of the fistula tract should be undertaken. The fistula should be assessed for point of origin, condition of adjacent bowel, presence of abscess, and any distal obstruction or bowel discontinuity. This can be accomplished with a range of radiological examinations: Nutritional Support As previously discussed, adequate nutritional support is an essential component of effective management; it is critical to keep the patient in positive nitrogen balance to promote healing of the fistula tract. On the negative side, the delivery of TPN through central venous catheters is associated with an appreciable rate of bacteremia and line sepsis. In one study conducted by Wong and colleagues , positive blood cultures were obtained from  During a small retrospective study, Collier et al. Researchers also noted that the use of early enteral nutrition resulted in earlier primary abdominal closure and lower hospital charges. In selected patients, enteral nutrition may be used to maintain nutritional status while promoting fistula closure. Therefore enteral nutrition may be feasible for the patient whose fistula is located in the most proximal or distal portion of a functional GI tract; if the fistula is located in the most proximal segment of the bowel, the enteral feeding must be administered distal to the fistula. Many types of enteral solutions are available, and a dietician should be consulted to recommend the most appropriate solution and administration procedure so that GI intolerance e. Skin Protection and Containment Establishing and maintaining skin protection and containment of the fistula effluent can be a challenging and yet rewarding experience. It is beneficial for WOC nurses managing the patient with an ECF to frequently remind themselves of the four general principles presented by Rolstad and Wong  Assess the pouching system and seal frequently; expect to make changes in the management system. Build flexibility into the care plan. Innovate, using the easiest, most practical approach first. Recognize that care of the patient is frequently provided by inexperienced caregivers. Skin protection and effluent containment should be initiated as soon as the fistula develops and is not contingent upon medical diagnosis. Methods and techniques for skin protection and containment will be described in the intervention section of the chapter and are presented in Tables and

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## 5: Enterocutaneous Fistula - Pictures, What is, Pathophysiology

*Management of enterocutaneous fistulas (ECFs) involves (1) recognition and stabilization, (2) anatomic definition and decision, and (3) definitive operation. Phase 1 encompasses correction of fluid and electrolyte imbalance, skin protection, and nutritional support.*

Enterocutaneous Fistula Management Enterocutaneous Fistula Management Perhaps one of the most challenging patient care situations that a wound, ostomy, and continence WOC nurse can encounter is the management and treatment of an enterocutaneous fistula. Nursing management of fistulas includes: Achieving predictable and effective containment of the fistula effluent often proves to be essential for patients to effectively cope with this rare and frustrating complication. Because each individual patient situation has its own complexities, management requires developing creative and individual plans of care. Utilization of basic pouching concepts, previously reported customized techniques, and networking with WOC nurses are invaluable tools to achieving the goals for management of enterocutaneous fistulas. Surgical history includes numerous abdominal surgeries, including multiple laparotomies and lysis of adhesions, as well as sigmoidectomy with loop colostomy and subsequent colostomy takedown, total abdominal hysterectomy with left salpingo-oophorectomy, open cholecystectomy, and small bowel resection. With the last small bowel obstruction she underwent exploratory laparotomy and four-hour lysis of adhesions. She experienced complications including a deep vein thrombosis, and postoperative wound infection with methacillin-resistant staph aureus, and an enterocutaneous fistula at the most proximal aspect of her incision. Perifistular skin protected by creating a pseudo scab Yaunker suction catheter used to collect effluent during dressing changes to keep perifistular skin dry. Stomahesive powder applied to the denuded areas of skin with the excess blown off, and protective skin barrier wipe dabbed over the powder. Perifistular skin prepared with skin cement Skin cement applied to fill in the creases on the abdomen and left for several minutes to allow the solvents to evaporate. Hydrocolloid molded to fit crevices Cohesive hydrocolloid material molded to fit the deep defect distal to the fistula. Perifistular skin protected by creating a pseudo scab Perifistular skin prepared with skin cement Hydrocolloid molded to fit crevices Picture 4: Layering hydrocolloid material to build an even surface Four-inch hydrocolloid seals cut in five wedge shaped pieces and molded together with a tongue blade around the distal aspect of the stoma. Hydrocolloid molded together with a tongue blade Two-inch hydrocolloid seal, divided in half and layered to create a double thickness, placed above the stoma. Peristomal plane was now even. Pouching system applied and reinforced A convex skin barrier and drainable pouch were applied as a unit, an ostomy belt was secured, and additional pieces of soft cloth tape were placed around the tape collar to further enhance the seal. Hydrocolloid molded together with a tongue blade Pouching system applied and reinforced Pouching system allowing containment of fistula effluent Pouching system allowing containment of fistula effluent Picture 7: Pouching system allowing containment of fistula effluent The patient rested for 15 to 20 minutes to allow her body heat to enhance product adherence. The products used were comparable in cost, accessible, and easily customized for the patient. The application time was reduced by minutes compared with other pouching techniques performed. Patient return visits required for applications were reduced to twice week in an outpatient clinic setting. The patient was able to regain a productive and active lifestyle including resumption of her exercise routine of walking up to two miles a day. The products used with this technique have been further utilized to customize other pouching systems for patients with enterocutaneous fistula s as well as less than ideal ostomy stomas to achieve adequate wear time.

# MANAGEMENT OF ENTEROCUTANEOUS FISTULA pdf

## 6: Management of draining wounds and fistulas | Musculoskeletal Key

*Enterocutaneous fistula is an abnormal communication between the bowel and skin (Enterocutaneous fistula. It is often accompanied by intra-abdominal abscesses. Despite improvement in its management with the use of parenteral nutrition, newer antibiotics, somatostatin analogues, improved intensive care and better imaging techniques and surgical treatments, the mortality rate is still around 10%.*

Following diagnosis, management strategies may have to be adapted frequently to address changes in fistula output, surrounding skin or wound condition, overall patient clinical and nutritional status, mobility level, and body contours. Following a motor vehicle accident, a year-old man with a body mass index of  Abdominal creases and the need to protect a split-thickness skin graft of the wound surrounding his fistula complicated wound management. During his prolonged 4-month hospital stay, the patient underwent several surgical procedures, repeated wound debridement, and various nutritional support interventions; a wide variety of wound and fistula management systems were utilized. One year after the initial trauma, the fistula was surgically closed. One week later, the patient died from a cardiac event. This case study confirms that GI fistulas increase costs of care and hospital length of stay and require the experience and expertise of a wide array of patient support staff members and clinicians. Please address correspondence to: A fistula is an abnormal passage between two hollow organs or a hollow organ and the skin. Care of a GI fistula can be very challenging for the healthcare team and initiates a prolonged course of recovery for the patient. GI fistulas may occur after a surgery or spontaneously. The predominant causes of death are sepsis, electrolyte imbalance, and malnutrition. According to a literature review8 of enterocutaneous fistula management, the nutritional status of the patient should be assessed preoperatively. Anemia can compromise oxygen delivery to the tissues; patients should be normovolemic. Preoperative antibiotic therapy ie, preoperative bowel and skin preparation decrease the risk of infection and therefore fistula development. Hemostasis must be achieved, incidental enterotomies avoided, and serosal injuries identified and repaired. An omental flap should be used to shield the anastomosis from the incision. Finally, the abdominal wall should be closed securely to avoid injury to the underlying bowel. If a fistula develops, its course and nature must be assessed. Methylene blue can be used to confirm the presence of a fistula but may not provide sufficient anatomic information. Fistulograms are performed by inserting a soft catheter into the fistula and instilling contrast media. Fistula output depends on its origin in the bowel â€” the more proximal the fistula in the GI tract, the larger the volume of output. Initial management of a fistula includes diagnosing the fistula and stabilizing the patient. The patient typically has had a poor early postoperative course; many patients experience fever and a prolonged ileus. Usually, wound erythema develops, then purulent drainage, followed by enteric contents that drain from the wound. Fistula fluid loss can lead to dehydration; intake and output must be meticulously measured and recorded. Hepatic protein synthesis also has been found to improve with enteral feeding. The albumin level may take 14 days to return to normal when depleted. Although prealbumin levels may decrease in the presence of inflammation and zinc deficiency, as well as in the immediate postoperative period, these levels do not decrease with dehydration and may increase during prednisone therapy. However, randomized controlled trials17,18 of 31 and 14 patients, respectively, with fistulas that compare the use of placebo nonoperative therapy versus octreotide demonstrated that use of octreotide failed to demonstrate a consistent decrease in fistula output or closure rates. An adverse effect is the development of gallstones. Drainage can be contained using gauze dressings, pouches, and suction catheters. The location of the fistula â€” within an incision or in an area of abdominal creases â€” may complicate pouch application. When a fistula is located within a wound, achieving a secure pouch seal is difficult, requiring innovative dressing techniques to protect and cover the moist granulation tissue around the fistula. Negative pressure wound therapy NPWT has been utilized to contain the effluent and promote wound healing when a fistula is located within an open wound. In all cases, fistulas treatment requires a multidisciplinary approach including medical nutrition services. Often, long hospital stays occur with medical management. Because the open wound and presence of effluent are likely to have a detrimental effect on body image,27 psychosocial support is of great importance. Physical and

occupational therapy may be needed to maintain mobility and facilitate activities of daily living. Surgical closure of a fistula must be a carefully considered option. Major abdominal surgery stimulates the formation of dense adhesions, especially when complicated by intra-abdominal sepsis and fistula formation. Adhesion development is maximal from the third to tenth postoperative week. In addition, delaying the operation decreases the risks of multiple enterotomies and difficult dissection that would be present in the immediate postoperative period due to the presence of adhesions. He was wearing a seatbelt at the time of his accident and sustained a severe external seatbelt injury to his abdomen in addition to his internal injuries. He also had a history of peripheral vascular insufficiency. At admission, he weighed kg and was cm tall body mass index Initial CAT scan revealed previous gastric bypass surgery that was suspicious for mesenteric laceration. Following admission, his abdominal area became increasingly tender so he was taken to surgery within 24 hours of the initial injury. The surgery included an exploratory laparotomy with resection of infarcted mid-jejunum 53 cm , end-to-end anastomosis, repair of a mesenteric laceration, lysis of adhesions, and repair of ventral hernia and enterotomy. Pathology revealed ischemic bowel and transmural necrosis. TPN was initiated for nutritional support. On postop day 6, Mr. The redness increased very rapidly, causing concern he was developing necrotizing fasciitis of the abdominal wall. The surgeon performed bedside wound debridement and continued to closely watch the wound. Two days later postop day 8 , Mr. The tube was tunneled through the anastomosis to the abdominal wall and connected to low continuous wall suction set at 80 mm Hg to reduce tension at the site of anastomosis. An area of abdominal skin and soft tissue, approximately 45 cm x 40 cm x 5 cm deep, also was removed due to devitalized fat and a degloving injury. The soft tissue injury was consistent with the location of his seatbelt. Abdominal closure was limited by a previous ventral hernia repair with mesh and the large soft tissue injury. The decision was guided by Mr. L returned to surgery 48 hours later for further debridement of the abdominal wall and to change the NPWT dressing. Only a few areas of necrotic subcutaneous tissue and fascia needed to be debrided. At this point, his prealbumin was 1. After 4 days, the surgeon believed Mr. L was stable enough to have the NPWT dressing changed at the bedside. Ischemia of the subcutaneous tissue was noted along with enteric drainage at the wound base. Three days later, the NPWT dressing was changed at the bedside. The wound was 42 cm x 32 cm x 6 cm deep. Recurrence of the fistula was evidenced by enteric-type drainage and gas bubbles in the right side of the wound base. Because the wound was too large for conventional pouches, the NPWT dressing was continued at continuous mm Hg and PVA foam was applied over the acellular wound matrix. Wide-mesh nonadherent gauze and PVA foam were placed over the area of the fistula and three large reticulated foam dressings were used to cover the remainder of the wound. Because the fistula was draining more than 1, mL daily, a red rubber catheter also was placed in the wound bed and connected to low continuous wall suction 80 mm Hg because the NPWT system was unable to contain the large amount of output. Sixteen days after the last debridement, Mr. During this procedure, areas of loose acellular dermal matrix were removed. The fistula was intubated with a red rubber catheter. NPWT was continued with polyvinyl alcohol foam and reticulated foam dressing continuous 50 mm Hg. Two NPWT tubes were utilized to collect the large amount of drainage from the fistula. One of the tubes was placed directly over the red rubber catheter and a second tube was placed in the inferior aspect of the wound. The abdominal wound began to granulate and 5 weeks after the initial trauma, split-thickness skin grafts were applied. Due to the drainage, some loss of the skin graft inferior to the fistula was anticipated, but the approach used was thought to be the best method to obtain final wound closure. Many variations of NPWT application were tried to manage the high fistula output and prevent loss of the skin graft, particularly on the inferior aspect of the wound. This included use of NPWT in conjunction with an ostomy pouch over the fistula site. Simethicone drops were instilled through the tubing into the canister to reduce the bubbles. During this time, TPN was continued for nutritional support. His social worker, case manager, pastoral care, and the nursing staff provided psychological support. Continuity of care was emphasized and a core of three to four nurses who took a personal interest in his case was routinely assigned. Room decorations, humor, and casual conversations were part of his daily care, which provided distraction and emotional support. After 2 months, the goal became to increase Mr. Experienced WOC nurses tried various pouches, challenged by the changing contours of his abdomen with movement. Fistula output

remained high and ranged from 2, mL to 3, mL per day. Pouch adhesion was further complicated by the presence of moist granulation tissue at the wound base around the fistula. Because of the large amount of effluent, the pouch was attached to suction for the majority of the time but was connected to a straight drainage system when wall suction was disconnected for physical therapy activities. L to experience a change in scenery and to go to the gym for physical therapy. Despite trying multiple pouches and modifying the application process, maximum pouch seal duration was usually less than 24 hours. After 10 days, frequent pouch leakage, subsequent skin irritation, and Mr. A modified T-tube was placed in the fistula stoma by the surgeon and connected to low continuous wall suction at 80 mm Hg to reduce the effluent going onto the wound. Octreotide was tried, but little change in the volume of output was noted; therefore, it was discontinued after several weeks. Throughout this time, the skin graft was adherent superior to the fistula, but had not taken on the inferior aspect due to constant exposure to fistula effluent. Almost 3 months after initial trauma, Mr.

# MANAGEMENT OF ENTEROCUTANEOUS FISTULA pdf

## 7: Enterocutaneous Fistula Management

*Management of Enterocutaneous Fistulas UCSF Postgraduate Course in General Surgery Maui, HI March 21, Hobart W. Harris, MD, MPH Fistula: an abnormal communication between two.*

Radiotherapy followed in cancer therapy Diagnosis For enterocutaneous fistula diagnosis, initial physical examination is very important and depending upon the physical condition following tests is conducted for confirmation: If fistula developed at colon then barium enema test is conducted CT scan Esophagram. Usually before X-ray, swallowing of barium is very important and then multiple series of X-rays are conducted which helps to take proper images of esophagus. The administration of barium causes changes in the shape of the esophagus. In this process the dye in penetrated at the opening of the fistula skin and X-rays are taken. According to the patient condition healthcare staff prepare proper treatment plan for particular patient. The wound associated cannot heal naturally with time, it need complex surgical intervention for cover the fistula opening and again connection is re-established in the gastrointestinal tract. The management of Enterocutaneous fistula, it is necessary to step wise treatment plan: Identification and stabilizing the patient deteriorating condition In this step, after diagnosis, if enterocutaneous fistula is detected, then fluid loss related complications should be controlled. For this reason, intravenous fluid intervention, controlling the fluid leakage and caring of the associated cutaneous layer are very important steps. After establishing these steps, next major clinical concern is nutritional supply to overcome the malnutrition problem. Water-soluble vitamins, electrolyte replenishment and calorie adjustment is required to manage the condition. Underlying cause and complications identification: Identification and management of these conditions is very important prior to operation. Usually in case of severe infection, due to immunosuppression and impaired wound healing, it is necessary to control the condition and possible antibiotic therapy or other treatment management is applied according to the need. Step 4, Surgical Interventions: Dissection of intestine with various invented method which include meticulous technique, ligament of Treitz to the rectum may perform. Resection and end-to-end anastomosis also included intervention method. Post-operative care is very important to heal the wound fast. Pictures The pathophysiology of fistulas at http:

## 8: Enterocutaneous fistula - Wikipedia

*Management of the Complicated Enterocutaneous Fistula Christopher D. Raeburn, MD Department of Surgery Grand Rounds University of Colorado Health Sciences Center.*

## 9: Enterocutaneous fistula - SurgWiki

*In this chapter the pathophysiology of fistula formation, the medical and surgical aspects of managing a patient with a fistula and the nursing management (i.e., skin protection, odor control, containment techniques) of the patient with a fistula will be presented.*

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