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This study has been developed to describe the Enterocutaneous fistula (ECF) and its management and treatment.

Objectives:

- o Define the etiology of fistulas.
- o Review the classification of fistulas.
- o Review medical management and treatment.
- o Describe nursing management and treatment.

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Fistula Management

Fistulas present a number of challenges for the patient and clinician. The purpose of this article is to discuss the Enterocutaneous fistula (ECF) and to address the management and treatment of an Enterocutaneous fistula.

- Objectives:
1. Define the etiology of fistulas.
 2. Review the classification of fistulas.
 3. Review medical management and treatment.
 4. Describe nursing management and treatment.

Fistulas

"A fistula is an abnormal passage between the lumen of a hollow viscous organ and another hollow organ or the skin." (Pontieri-Lewis, 2005, p. 68). The Enterocutaneous Fistula is an abnormal connection between the intestine and skin (Colwell et al., 2004).

Etiology

Enterocutaneous Fistulas can occur for a number of reasons. Fistulas can occur postoperatively from a breakdown at an intestinal anastomosis, from excessive tension on the anastomosis or a foreign body close to the suture line. Other factors involving emergent and or urgent surgical procedures such as an unprepped bowel, underresuscitation, malnourishment, or previously radiated tissue can cause fistula development (Kozell & Martins, 2003). Predisposing factors to the development of an ECF are malignant tissue, Crohn's disease, small bowel obstruction, infection, steroid therapy, metabolic and endocrine disorders, and a compromised vascular supply (Colwell et al., 2004). Fistulas can occur spontaneously in approx. 10%-15% of patients due to intestinal diseases such as Crohn's disease, malignancy, infectious processes such as tuberculosis, diverticulitis, vascular insufficiency, radiation exposure and mesenteric ischemia (Kozell &

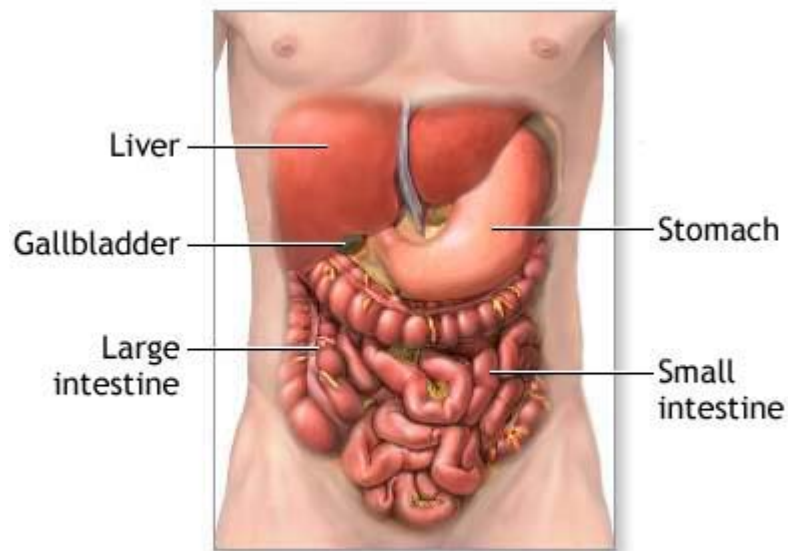
Martins, 2003). Mortality rates of fistula patients can occur from 6%-20%, despite considerable improvements in intra-operative technique, improvements in diagnosis and management of sepsis, perioperative care and nutritional support (Cobb & Knaggs, 2003). According to Kozell & Martins (2003), high output fistulas have a mortality rate of 37%.

Classification

Fistulas are classified in different categories, depending on their complexity. A Simple Enterocutaneous Fistula has no associated abscess or organ involvement. It has a short direct tract. A Complex 1 Fistula, has an abscess and or organ involvement. A Complex 2, Fistula opens into the base of a disrupted wound. Fistulas can be classified by anatomical location or by the volume of output (Colwell et al., 2004).

Type of Fistulas

An Enterocolonic Fistula occurs from the intestine to the colon. An Enterocutaneous Fistula occurs from the intestine to the skin. An Enterovesical Fistula occurs from the intestine to the bladder. An Enterovaginal Fistula occurs from the intestine to the vagina. A Vesicocutaneous Fistula occurs from the bladder to the skin. A Vesicovaginal Fistula occurs from the bladder to the vagina (Pontieri-Lewis, 2005). Photo of the Gastrointestinal system from www.healthline.com.



ADAM.

Physical Signs

Excess fluid through the wound is often the first sign there is a fistula. Low output is directly related to the large bowel while high output is directly related to the small bowel (Cobb & Knaggs, 2003). In describing output from a fistula; output can be watery – originating from the gastric area. Bile output is from the gastric, biliary and duodenum.

Yellow/orange output color indicates origin from the small bowel. Colorless output is from the Pancreas. Brown/fecal output is from the large bowel (Kozell & Martins, 2003).

Patients commonly develop fever, localized erythema, induration, and progressive local discomfort. Electrolyte imbalance, such as low potassium, and alterations in mental status are frequently present. Sepsis, malnutrition, dehydration, anemia, tissue destruction, acid/base balances and mortality can occur (Colwell et al., 2004).



Arrows indicate fistula formation, 2- Enterocutaneous Fistulas, from <http://surgicaltutor.org>.

Medical Management and Treatment

The goal of medical management is to hopefully close the fistula spontaneously. It can take approximately 4 to 7 weeks with conservative management to close a fistula.

Approximately 60%-70% of fistulas will close spontaneously (Colwell et al., 2004). Measures to medically manage the fistula include: hospitalization, maintaining fluid and electrolyte balance, providing bowel rest and nutritional support and initiating medical treatment. Treatment includes ensuring skin protection and containing the fistula effluent (Pontieri-Lewis, 2005).

There are four phases listed in the management of Enterocutaneous Fistulas by Kozell and Martins (2003). The phases are stabilization, investigation, conservative treatment and surgery.

Stabilization

Stabilization is the maintenance of fluid and electrolyte balance. The Gastrointestinal tract excretes five to nine liters of sodium and potassium, chloride and bicarbonate daily. The excretion of these electrolytes can result in hypovolemia, inadequate tissue perfusion, renal failure, sepsis, hemorrhage and evisceration. The medical conditions require immediate surgical intervention. Local and systemic sepsis must be treated with appropriate antibiotics. The patient is placed on 'nothing by mouth' which minimizes intestinal output, to rest the gut (Kozell & Martins, 2003).

Investigation

Investigation is the assessment of the anatomical features of the fistula. The fistula is assessed by radiography, called a fistulogram, to determine the origin of the fistula, the length of tract, the continuity of the bowel and other manifestations such as abscess or distal obstruction. The test is usually done between days 7 to 10, when the fistula tract has matured post operatively. Computed tomography, cystoscopy, intravenous pyelogram and ultrasound can be used to identify impediments to fistula closure (Pontieri-Lewis, 2005).

Diagnostic Studies

A fistulogram is a radiographic study that will assist in determining the site of the fistula in the gastrointestinal tract and the skin. A soft catheter is inserted into the fistula and then a contrast dye is instilled. This will also determine patency of the gastrointestinal tract distal to the fistula. Other tests such as barium enema maybe performed, and upper Gastrointestinal x-rays with small bowel follow-through (Pontieri-Lewis, 2005).

Conservative Treatment

Conservative treatment of fistula management includes nutritional support, effluent containment, promoting the patients physical and psychological wellbeing and appropriate use of the patient's dollars (Kozell & Martins, 2003). Nutritional support can be either in the form of oral, enteral, or parenteral nutrition dependent upon a patient's tolerance, the ability to ingest sufficient quantities, the fistula tract location and the bowel mucosa's absorptive capacity. Acceptable protein requirements are 1.5 to 1.75g/kg in a 24 hour period and 45 calories a kg per 24 hours for caloric needs (Kozell & Martins, 2003). High output fistulas or small proximal bowel fistulas can have drainage more than 1000/ml a day. The affected patients are at risk for dehydration and electrolyte imbalance. They are good candidates for total parenteral nutrition (Pontieri-Lewis, 2005). Patients are encouraged to maintain bowel rest and keeping the patient nothing by mouth for at least 4 to 8 weeks (Pontieri-Lewis, 2005).

Surgery

Fistulas can be operated on in the presence of bowel necrosis or abscess. To become a surgical candidate, the patient's condition must be optimized. The patient should be sepsis free for 6 to 8 weeks, have a positive nitrogen balance and the abdominal wall and surrounding tissue should be soft and supple (Kozell & Martins, 2003). Closure of type 2 complex fistula is a surgical closure. The fistulas are usually closed between 10 to 13 weeks. The surgical approach will be either resection or diversion of the fecal stream proximal to the fistula, creating an ostomy or end to end or side to side anastomosis (Kozell & Martins, 2003).

Further Management- Pharmaceutical

Pharmaceutical agents can assist in decreasing of fistula output. Octreotide (Sandostatin) inhibits the release of gastrin and other gastrointestinal hormones thus decreasing the intestinal volume (Pontieri-Lewis, 2005).

Fibrin glue can be used to seal a fistula tract, in a low-output fistula. The glue is composed of fibrinogen and thrombin which forms a gel when mixed together. The gel is then endoscopically injected into the fistula tract to create a seal (Pontieri-Lewis, 2005).

Nursing Management and Treatment

Nursing management of a fistula encompasses many goals including treating sepsis, initiating nutritional support, maintaining fluid and electrolyte balance, providing patient education and peristomal skin protection/fluid containment. It is crucial that health professionals who work as a team to create a plan of care to integrate medical management and nursing management techniques with the collaboration of a wound ostomy continence nurse (Pontieri-Lewis, 2005). It is important to implement a cost-effective system, promote patient comfort, optimize physical function and control odor (Colwell et al., 2004). There are 4 areas to consider providing the most appropriate care to the nursing management and containment of a fistula. The 4 areas are to either manage the fistula with a dressing, pouch, suction or a combination of dressings. The deciding factors to determine the management of the fistula are: if the volume of output is more than 100ml/24hr, if odor is a problem and if the fistula opening is less than 3 inches and if an access cap is needed (Bryant & Nix, 2007). The fistula opening is measured by length and width in centimeters. If the fistula volume is more than 100 ml/24 hours then a pouching system is appropriate. If the volume is less than 100 ml/24 hours then dressings and skin protection is suggested. If an access cap is needed for volume more than 100 ml/24 hours, then a wound management system or a 2 piece pouching system is appropriate. This is also appropriate for a fistula that is odorous. When the fistula opening

is less than 3 inches, pouches are appropriate that are small. For example, a pediatric pouch, small wound management system, fecal incontinence collector, a female urinary incontinence pouch, retracted penis pouch, or a 1 or 2 piece ostomy pouch with urinary or fecal spout is appropriate. If the fistula opening is larger than 3 inches, appropriate pouches include a 2 piece ostomy pouch with urinary or fecal spouts, a medium or large wound management system, a open-end drainable pouch or customized pouching system (Bryant & Nix, 2007).

Containment of the Fistula Output/Application of Pouches

Pouches with solid skin barriers that are available in various sizes, shapes, materials and are drainable (Colwell et al., 2004). The skin barrier provides an adhesive seal and provides skin protection. The skin barrier can be either integrated into the pouch or separately attached to the pouch. Expected length of wear time of skin barriers is usually 3 – 7 days. If the appliance begins to lift and leak, fistula effluent will cause excoriation and the appliance should be changed to skin breakdown and discomfort for the patient. If applying a pouch, effluent should be emptied regularly from the pouch and the output should be noted and documented. Frequent emptying will extend the length of time of the pouch wear. A high output pouch might be emptied on the hour of connected to a secondary container allowing continuous gravity drainage (Cobb & Knaggs, 2003).

Perifistular Skin Protection

Effluent from a fistula is corrosive, especially in the small bowel or from pancreatic drainage. Effluent is corrosive to the perifistular skin, the skin that is around the fistula (Bryant & Nix, 2007). Measures must be taken, to care for the perifistular skin and select a suitable appliance to collect the effluent. Each patient is individual and care must be

taken, to select the appliance most appropriate for the patient (Cobb & Knaggs, 2003). In addition to applying the appropriate appliance, patient assessment is crucial to identifying any skin folds, or irregular skin surface to select the most appropriate skin barriers for skin protection. Patients should be assessed in a supine or semi-fowlers position. The assessment will indicate what type of appliance is needed, such as a flexible or convex appliance and if filling agents are needed such as paste or strips to fill in irregular surfaces or if adhesives are needed (Bryant & Nix, 2007). Skin sealants or adhesives enhance adherence of a pouching system and help provide a barrier on the skin if there is leakage (Bryant & Nix, 2007).

If at all possible, alcohol based barriers should be avoided on broken skin, as this can cause stinging and discomfort to the patient, (Burch, 2003).

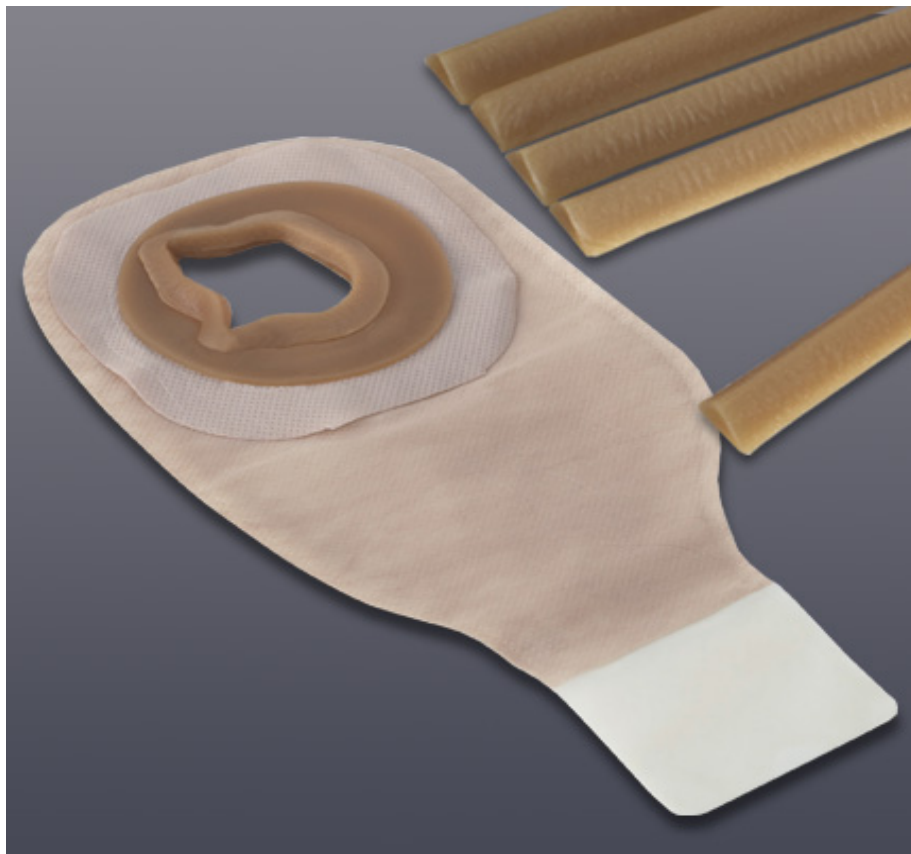


Photo of pouching system, with barrier strips, from <http://Hollister.com>.

Skin barrier powders create a dry surface when the patient's skin is denuded from effluent and skin barrier powders absorb moisture. Adhesives can help seal in the powder once it is applied, to create a dry surface for the a pouch skin barrier to adhere to (Bryant & Nix, 2007).

Within 3 to 4 hours of contact with fistula output, the patient's skin can excoriate which can lead to increased pain and reduced adhesion of the appliance (Burch, 2003). Wet skin can be dried by a variety of methods. Using a cloth, can be painful and may cause trauma to the skin. Leaving the wound open to air, is not an option, due to the high output of a fistula. The use of a cool hair dryer, is an affective alternative, but not a research proven method (Burch, 2003).

There are a number of products to protect the perifistular skin. You may need only one barrier or a combination of skin barriers to prevent skin contact with the fistula output.



Arrows indicate fistula formation at the abdomen. Photo from <http://surgicaltutor.org>.

Appliance Leakage and Suction Catheters

Appliance leakage can become a problem when the patient's mobility increases. It is a good idea, to empty the pouch before mobility and when applying a new appliance it is important to have the patient rest for an hour to allow the appliance to seal before becoming mobile (Burch, 2003). Suction catheters are appropriate when a fistula has high output. A catheter is inserted into an ostomy pouch to contain the effluent. If a pouch with an end adaptor is used then the suction catheter can be threaded through the adaptor into the pouch. Extra care must be taken to keep the catheter from coming into contact with the fistula or base of the wound. This can be achieved by placing a piece of gauze or nonadherent dressing at the base of the fistula or wound bed, (Burch, 2003).

Suction catheters can be attached to low, intermittent suction. This will help contain the high volume of output if the effluent is liquid. Thick drainage will occlude the catheter. Continued measures must be taken to protect the skin, as leakage can still occur (Bryant & Nix, 2007). Negative pressure wound therapy (NPWT) had been effective in containing effluent and aiding in wound healing. The use of NPWT is for explored enterocutaneous fistulas (Bryant & Nix, 2007).

Controlling Odor

Odor can be controlled with pouching the fistula to contain the effluent. Most pouches are odor proof, though many urinary pouches are not odor proof. Dressings do not control odor unless you are applying a charcoal impregnated dressing over the gauze dressing (Bryant & Nix, 2007). To control odor, dispose of soiled linens and dressings from the room as soon as possible, try to prevent splashing effluent on the patient/linens when emptying a pouch, cleanse the tail of pouches after emptying, and use deodorants appropriately. External deodorants are available in room sprays, liquids or powders or tablets that can be added into a pouch. Room sprays should be odor eliminators not just mask odors (Bryant & Nix, 2007).

Time Management

When caring for a fistula, there are considerations involving time management. Clinicians must be aware that some dressing or pouch changes can take hours, and more than one staff member may be needed to assist. Measures must be taken to provide pain management before the dressing or pouch change. There can be psychological issues regarding the fistula in addition to the pain. It is important for clinicians to be sensitive to the patients need and provide the support and time required during the dressing or pouch change (Renton, Robertson and Speirs, 2006).

Cost Containment

Fistula management also includes cost containment. This includes the cost of the supplies but should consider the nursing time, and patient comfort. A well applied appliance appropriate appliance can prolong wear time, reducing time spent replacing an appropriate system. Frequent dressing changes can be stressful and uncomfortable for the patient (Cobb & Knaggs, 2003).

Conclusion

Fistula management can be very challenging for both the clinician and the patient. Utilizing the variety of management techniques to care for a fistula can be a very useful guide to the successful management and outcome of treating a fistula. Supportive and collaborative measures are key to the continued success and goal of managing a fistula.

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Post Test

Select True or False

1. A fistula is an abnormal connection between one hollow viscous organ and another hollow organ or skin.	T	F
2. Fistulas can occur for a number of reasons, such as tension or breakdown at the intestinal anastomosis.	T	F
3. An Enterocutaneous fistula is a abnormal connection between the bladder to the skin.	T	F
4. Some of the signs of fistula development are fever, increased fluid output at the wound site, and localized erythema.	T	F
5. Fistulas can cause electrolyte imbalance, sepsis and mortality.	T	F
6. Medical management of a fistula only involves pharmaceutical management.	T	F
7. The four phases of Enterocutaneous fistula management is stabilization, maintenance, conservative treatment and surgery.	T	F
8. Conservative treatment promotes the patients physical and psychological well being.	T	F
9. A Fistulogram is a radiographic study that assesses the site of the fistula in the gastrointestinal tract and skin	T	F
10. High output fistulas occur at the small bowel.	T	F
11. Fibrin glue can be applied to seal a fistula tract that occurs in a high output fistula.	T	F
12. The goals of nursing management include protecting the perifistular skin and fluid containment.	T	F
13. Perifistular skin is the skin around the wound only.	T	F
14. If the volume of output is less than 100 ml/24 hours then the fistula should be pouched.	T	F
15. If the fistula opening is less than 3 inches, a large wound drainage collector is appropriate.	T	F
16. Care must be taken to protect the perifistula skin as the fistula drainage is odorous.	T	F
17. When the perifistular skin is exposed to fistula drainage, the skin can excoriate in 1 hour.	T	F
18. It is important to be sensitive to the needs of the patient as there are psychological issues and pain management	T	F
19. Appliance leakage can be due to an increase in patient mobility and irregular skin folds at the fistula site.	T	F
20. Frequent dressing changes can be uncomfortable and stressful to the patient.	T	F

