ENTEROCUTANEOUS FISTULA

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Key Contents

Introduction.
Classification of entero cutaneous fistula.
Etiology of antero cutaneous fistula.
Prognostic Factor:
Surgical Management.

Learning Objectives

To understand the pathogenesis of entero-cutaneous fistula.
To understand the its classification.
To understand the surgical management of ant cut fistula.

Key words: Enterocutaneous Fistula, Nutrition, High output Fistula.

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Enterocutaneous Fistula

The most distressing situation to the patient, his relatives and surgeon is development of enterocutaneous fistula and fecal fistula postoperatively\(^1\). Enterocutaneous fistula is an abnormal communication between bowel and skin. it is often accompanied by intra-abdominal abscesses. Despite improvement in management with the use of parenteral nutrition, newer antibiotics, somatostatin analogue, improve intensive care and better imaging techniques and surgical treatment the mortality is still around 10%.

**Historic Aspects of Management.**

The historically the management of this complication has been divided into three era\(^2\). the first era was between 1945-1960 when the use of antibiotic was introduced\(^2\). In this era the mortality rate from enterocutaneous fistula was 45%.

Second Era ranges between 1960-1970, when emphasis was made on respiratory support, antibiotic, nutrition and intensive care\(^2\). during this period mortality dropped down to 15%\(^3\).

Third era was between 1970-1975 when central intravenous nutrition was introduced. although mortality rate did not improve but rate of spontaneous closure increased significantly\(^3\).

**Classification of Fistulas.**

Previously enterocutaneous fistula were classified in the following manner.

- **High output.**
  Output greater than 500ml per 24 hr.

- **Moderate output.**
  output between 200 ml to 500 ml per 24 hr.

- **Low output.**
  Output less than 200ml per 24 hr\(^3,4\).

It is no more favoured and the current classification is based on anatomical location of fistula\(^7\).

**Type 1.**
Refers to abdominal oesophagus and gastro-duodenal fistula.

**Type 2.**
Refers to small bowel fistula.

**Type 3.**
Refers as large bowel fistula.

**Type 4.**
Refer to fistula at any site but associated with large abdominal wall defect.

This is correlated with the mortality. it is estimated that type 1 fistula carries a mortality of 17%, type 2 about 33%, type 3 about 20% and type 4 about 60%\(^7\).

**Investigations**

After the initial 48 hours most patients will have stabilised enough to allow investigations 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 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 informations is sought:
• Nature of the fistulous tract.
• Site of entry into the bowel.
• Nature of adjacent bowl (whether strictured, damaged or inflamed).
• Intestinal continuity (whether is is a side or an end fistula).

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.

Causes of Enterocutaneous Fistula.
Causes of enterocutaneous fistula includes inadequate surgical technique, diverticulitis, biliary tract obstruction and malignant diseases. The postoperative causes of fistula includes anastomosis leakage, inadvertent enterotomy, local sepsis, distal obstruction, presence of foreign body like mesh dehiscence and complex wound problem.

In developing countries where surgical experience is limited include following causes of enterocutaneous fistula, after surgical closure of typhoid perforation, lysis of adhesion in intestinal obstruction, illegal septic abortions, gynecological procedure and operation around the duodenum.

Other causes include, inguinal hernia mistakenly incised as groin abscess or obstructed paraumblical hernia or groin hernia of richter's type and inadvertently catching loop of bowel with stitch while closing abdomen.

A fistula comunicating the caecum may result from operation for gangrenous appendix or drainage of appendicular abscess.

Complications of Enterocutaneous Fistula.
1. Electrolyte disturbances.
This usually involves potassium, sodium, magnesium and phosphate especially in patient on tpn.

2. Malnutrition.
This is most common with high output fistulas and when there is severe sepsis

3. Sepsis.
This is commonly associated with anastomotic leaks, and intra. abdominal or pelvic abscesses from enteric contamination.

Prognostic Factor in Enterocutaneous Fistula.
Serum levels of short turnover proteins such as albumin, retinol binding protein and serum transferrin are predictors of spontaneous closure of fistula and mortality. Of these serum transferrin level are more sensitive predictor of spontaneous closure while retinol binding protein and thyroxin binding albumins are predictor of mortality.

Patients who are not able to response to stress such as sepsis and neoplasm by increasing hepatic synthesis of acute phase protein, transferrin, retinol binding protein and thyroxine binding prealbumin has increased risk of mortality.
**Management**

Immediate Surgical correction of the fistula is usually not a treatment priority\(^{1,8,9,11,12}\).

The initial surgical treatment if indicated should be restricted to treatment of intra-abdominal abscess and hemorrhage when present. There is general agreement that nutrition and control of sepsis are two most important aspects of management. When these are instituted, most of the fistulas will close on conservative treatment.

Total parenteral nutrition (TPN), hyper-alimentation and enteral feeding have been effective\(^3\). The safety of feeding jejunostomy or enteral feeding in comparison with TPN is a distinct advantage\(^4\). The enteral feeding may be through a tube\(^5\) elemental enteral feeding beyond fistula\(^{12,14}\) or oral intake of high protein, high calorie diet with multivitamins added. Enteral feeding does not seem to prevent closure of a fistula, especially if the location is lower down in the gastrointestinal tract. The enteral diet routinely used\(^{12}\) consists of glucose polymers, protein, hydrolysates, medium chain triglycerides and essential fatty acids. A viscous additive was often added to slow down intestinal transit time and allow better absorption. The osmolality of such diet was usually between 300-350 mosm/L with a caloric concentration of 2.09 KJ/ml (0.5 Kcal/ml) to 18KJ/ml (1.0 K. ceat/ml). The amount of enteral nutrient given depends on the severity of the sepsis. The aim is to achieve weight gain and a positive nitrogen balance of 4 to 6 grams per day.

The advantage of total parenteral nutrition is that; it allows the gastrointestinal tract to rest, while providing nutrition. An effective treatment consists of total bowel rest and TPN providing 2000-5000 keal, 70-200 grams amino acids and 500-1000 mls of 10% fat emulsion daily\(^2\). Normal intravenous hyper alimentation formula that have been used successfully is: 500 mls 50% dextrose, 500 mls 8.5% amino acids, 6.4 grams nitrogen, electrolytes and vitamins. The caloric and nutrient requirement should be the same whether the mode of nutrition is enteral or parenteral\(^2\).

**The use of Somatostatin and Octreotide**

In a multial\(^16\) use of somtostatin helps fistula to heal faster, reduces complications, reduces the period of hospitalization and morbidity. Somatostatin is a naturally occurring 14-amino acid peptide that inhibits gastrointestinal hormone secretion\(^2\). This is usually administered in the treatment of fistulas as a continuous intravenous infusion.

**Octreotide**

A synthetic analogue of somatostatin has also been tried in the treatment of fistula. The dose used was 100 micrograms every eight hours subcutaneously, octreotide also shortens the time required for spontaneous closure of fistula\(^7\). When other adequate treatment is established.

**Adverse factors of spontaneous closure of fistula**

- Loss of intestinal continuity complete disruption of anastomosis or large > 1cm defect in bowel.
- Persistent intestinal obstruction distal of fistula.
- Large adjacent abscess cavity.
- Presence of foreign body (sutures,
Recognition of enterocutaneous fistulas

- Resuscitation
- Control of infection
- Local control of fistula output

Stable patients free of clinical signs of infection

- Nutritional support - TPN
- Pharmacologic Mx

Investigations

- CT scan
- Fistulogram
- Endoscopy if needed

Classify fistula according to output, etiology, location

Favorable

- Conservative Rx
  - Decrease in fistula output
    - Continue conservative Rx
  - No decrease in fistula output

Unfavorable

- Surgical Rx

Time frame for instituting Mx

- 24 hours – 3 days and ongoing as needed
- 5 – 7 days and ongoing as needed
- 10 – 14 days

4-12 weeks
gauze and prosthesis).

- Epithelialisation of Fistula

**The Role of Surgery**

Even though it is generally agreed that immediate surgical intervention is not a priority\(^5\). It is recommended surgical closure for most fistulas that persist beyond 30 days. But\(^5,8,9,12\). Now it is believed that when there are no complications one should wait for at least 6 weeks before thinking of surgical intervention\(^5,8,9,12\). Also, surgery is indicated when the fistula is complicated by intestinal obstruction bleeding or abscess formation.

Prophylactic antibiotic are usually not recommended and should be reserved for the treatment of septicemia and in the immediate preoperative period\(^5\). The preferred surgical procedure is complete resection if the bowel segment containing the fistula and an end-to-end anastomosis\(^12,11\). However, bypass of the fistula may be indicated if resection is hazardous such as in lateral duodenal fistula and bowel fistulas deep within the pelvis. Direct suture closure of the fistula is not recommended because the fistula often breaks down.

Local treatment of the fistula consists of irrigation of the fistula tract and aspiration of the fistula contents\(^18,12\) of a solution of 0.45% lactic acid for irrigation using about 2500 mls 24 hr. But even with a simple device such as a colostomy bag and frequent changing of dressings over the fistula, most will close\(^5\). Substances like karaya paste may be necessary to prevent excoriation of skin around the fistula\(^19\).

Reported mortality rate in enterocutaneous fistula ranges between 0 and 33%\(^5,6,11\).

**Conclusion**

Most uncomplicated enterocutaneous fistula will close spontaneously when properly managed. Surgery is usually not an immediate priority except to deal with complications. However, when surgical intervention is required to deal with the fistula resection and anastomosis or bypass procedures are the preferred surgical procedures. Simple suture of the fistula is not recommended.

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**References**


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