

ENTEROCUTANEOUS FISTULAS, OUR EXPERIENCE IN MANAGEMENTAnantha Ramani Pratha¹, Konkena Janardhana Rao², Kalyani Adiraju³, Ramprakash Gurrum⁴, Saikrishna Katakam⁵¹Associate Professor, Department of Surgery, Andhra Medical College, King George Hospital, Visakhapatnam, Andhra Pradesh.²Assistant Professor, Department of Surgery, Andhra Medical College, King George Hospital, Visakhapatnam, Andhra Pradesh.³Assistant Professor, Department of Surgery, Andhra Medical College, King George Hospital, Visakhapatnam, Andhra Pradesh.⁴Resident, Department of Surgery, Andhra Medical College, King George Hospital, Visakhapatnam, Andhra Pradesh.⁵Resident, Department of Surgery, Andhra Medical College, King George Hospital, Visakhapatnam, Andhra Pradesh.**ABSTRACT**

Enterocutaneous fistulas are a surgeon's nightmare, more so if they occur after one's own surgery. They are a challenge, testing the surgeon's patience and expertise. Their management remains a team work. The success depends on the wellbeing of the patient during this great ordeal of management. In this article, we are reviewing and presenting the experience gained by us while managing 58 cases of enterocutaneous fistulas.

We have studied the causes, the time of occurrence, the duration of conservative treatment, the methods of investigations and definitive treatment and ultimate outcome of our management of 58 cases of postoperative enterocutaneous fistulas, in a period of 5 years. Total 58 cases, postoperative enterocutaneous fistulas were the most common type (75%), 4 lost for follow-up. All fistulas were initially managed conservatively. Patients were maintained on total parenteral nutrition, evaluated for the cause and site of leak. High output fistulas were made as controlled fistula by diverting the loop to exterior following stabilisation, to minimise spillage and sepsis. Low output fistulas explored and definitive treatment carried out if there is persistent leak after 8 weeks. 8 ileal fistulas healed spontaneously (13.7%). 3 malignant rectal fistulas sent for radiotherapy. Initial damage control surgery was done in 15 cases (ileal+sigmoid+rectum) (25.86%). Definitive surgery was done in 39 cases (67%). Out of 54 cases, 15 expired-(27.7%)

KEYWORDS

Enterocutaneous Fistulas, Total Parenteral Nutrition, Conservative Management, Damage Control Surgery and Definitive Management.

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INTRODUCTION: Enterocutaneous fistulas are disastrous complications, these need to be prevented at any cost because of high morbidity and economic burden to the patient and society. Postoperative enterocutaneous fistulas form the most common type of enterocutaneous fistulas (ECF) 72%.^[1] Other causes are inflammatory bowel disease, malignancy, post irradiation^[2] Injury to serosa of the bowel during adhesiolysis, anastomotic break down in unfavourable conditions like suturing under tension, shock, and hypoperfusion or hyperperfusion and oedema of anastomotic line, anaemia, hypoproteinaemia, tuberculosis, immunocompromised conditions are some of the causes for breakdown of the bowel.² With the isotonic fluid pouring out from the fistula, patient soon goes into fluid and electrolyte imbalance, malnutrition, hypoproteinaemia and septicaemia. Hence management of enterocutaneous fistula consists of replacement of lost fluid and electrolytes, decreasing the loss, prevention of peritonitis and contamination improving the nutritional status. An initial damage control surgery followed by investigation to identify the site of fistula and definitive surgery are to be planned.

It is a team work involving surgeon, nursing staff, radiologists and intensivists.^[2]

The main objective of this study is to find out the type of ECF, cause, the method of management and the outcome, to prevent ECF occurrence in future and to decrease morbidity and mortality.

MATERIALS AND METHODS: All cases of enterocutaneous fistulas that were treated over a period of 5 years were recorded. These included the cases that were referred from other departments and from outside as well as those following our surgery. Aetiology, pathology was recorded; based on the type of fistula, some were treated immediately, some conservatively, some with damage control surgery. Later on, when the patient was fit or when the fistulas are mature, definitive surgery was done. Results were recorded. We have excluded biliary and pancreatic fistulas from our study.

58 cases of enterocutaneous fistulas that occurred over a period of 8 years were recorded;

Type	Cause
Stomach-1	Postoperative-1
Duodenum-5	Failure of repair of DU perforation-5
Jejunum -1	Postoperative-1
Ileum -38	Postoperative -38
Caecum -2	Postoperative-3

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Colon-6	Postoperative – Inflammatory-
Rectum -5	Malignancy -3 Trauma -1 Postoperative-1

Most of the fistulas are following recent surgery. 48 fistulas were postoperative, 3 were local infiltration of CA rectum (rectovesical, rectovaginal). Inflammatory bowel disease in 2 cases presented as subacute intestinal obstruction and limited resection of ileum and anastomosis resulted in postoperative fistulas. We have recorded a case of rectovaginal fistula after 10 years of hysterectomy. Rectum was adherent to vault, with rectovaginal communication. A rectovaginal fistula along with vesicovaginal fistula in a 22-year-old woman following obstructed labour was also recorded. There was one case of sigmoid breakdown after post-hysterectomy ovarian cystectomy. 5 cases were subacute small intestinal obstruction following carcinoma cervix. Exploratory laparotomy and adhesiolysis resulted in postoperative fistulae. 2 cases of volvulus sigmoid, one with gangrene, resulted in leak through abdominal wound after sigmoidectomy and anastomosis. Post-appendectomy, caecal break down and fistula formation was observed in 2 cases. In one case, there was delayed presentation of fistula after 6 months after surgery and exploration revealed a forgotten mop.

REVIEW OF LITERATURE: In our study, the age of patients ranged between 16 yrs. to 70 yrs. maximum incidence 45 to 55 yrs. Deepa Tagarsh et al reported maximum incidence at 65 to 70 yrs. age.¹ 28 were chronic smokers and alcoholics. Preoperatively, 35 patients were anaemic and malnourished. Intestinal obstruction gynaecological surgeries were the most common surgeries initially performed in our series, same was reported by others.¹ Gonzalez et al^[3] have classified fistulas depending on the origin and output, initial conservative management was followed to stabilise the patient and replacement of lost fluid and electrolytes. Octreotide was given to patients with high output fistulas. Initial TPN, and Octreotide will decrease the fistula output rather than TPN alone as per Spiliotis et al.^[4] Same was observed in our study. The fistulas presented from as early as 3rd day to as late as after 10 yrs. after surgery in our study.

Management - initially all fistulas were managed conservatively from few days to 2 months. Supportive treatment with IV fluids, antibiotics was started. Patient was kept nil by mouth and total parenteral nutrition was given until the output of fistula decreased. Dressing was done with Zinc based creams to prevent excoriation. Ostomy bag was applied. Ultrasound scan abdomen, fistulograms, CT abdomen were done to identify the site, extent number of tracts. When the fistula output began to decrease, nasointestinal tube was passed and tube feeding was given, in case of duodenal and high fistulas. Antibiotics were given for the initial few days to control sepsis.

Type	Initial management	Definitive management	Outcome
Stomach -1	Continued for 3 weeks.		Controlled spontaneously
Duodenum -5	Initial stabilisation	Closure, serosal patch, controlled fistula with Foley's bulb	4 survived one died
Jejunum -1	Initial stabilisation		Died in immediate postop period
Ileum – 38 low output-24 high output -14	Supportive treatment Diversion of fistula segment outside	Resection and end-to-end anastomosis	8 spontaneous closure 4 of low output died 7 of high output died
Caecum	Caecostomy	Limited resection of colon and ileocolic anastomosis	Survived
Sigmoid Colon	Hartman's procedure	Reversal	Survived
Rectum – inflammatory-1 Malignant infiltration -4	Diversion colostomy	Low anastomosis	Referred for radiotherapy
Enterocutaneous Fistulas- Management			

Total 58 cases, postoperative enterocutaneous fistulas were the most common type (75%). 4 lost for follow-up. All fistulas were initially managed conservatively. Patients were maintained on total parenteral nutrition, evaluated for the cause and site of leak. High output fistulas were made as controlled fistula by diverting the loop to exterior following stabilisation to minimise spillage and sepsis. Low output fistulas explored and definitive treatment carried out if there is persistent leak after 8 weeks. 8 ileal fistulas healed spontaneously (13.7%). 3 malignant rectal fistulas sent for

radiotherapy. Initial damage control surgery was done in 15 cases. (ileal+sigmoid+rectum) (25.86%). Definitive surgery was done in 39 cases (67%). Out of 54 cases, 15 expired-(27.7%)

DISCUSSION: Enterocutaneous fistulas are disastrous complications with high morbidity, mortality and economic burden to the patient and stressful to the treating surgeon. Postoperative enterocutaneous fistulas form the most common type of enterocutaneous fistulas (ECF) 75 to 80%.²

Other causes are inflammatory bowel disease, malignancy, post irradiation. In our study, they were 86.2%. They are classified as low output (<500 mL) and high output (>500 mL).²

Site	Volume	Na mmol/L	K mmol/L	Cl mmol/L	HCO3 mmol/L
Saliva-	1500 mL	10	26	15	50
Stomach-	1500 mL	100	10	100	0
Duodenum	2000 mL	135	5	90	10
Ileum -	3000 mL	140	5	100	30
Bile	800 mL	150	5	100	35
Pancreas	800 mL	140	5	75	115

The electrolyte composition and normal amount of gastrointestinal secretions per day.^[2]

Any disruption of continuity of GIT will result in loss of the fluid rich in electrolytes outside GIT.^[5] The possibility of spontaneous closure of fistula and the amount of output of fistula depends on;^[6]

1. The site of fistula.
2. Size of fistula opening.
3. Number of fistulous tracts.
4. Length of fistula tract.
5. Presence of abscess /collection adjacent to fistula.
6. Any obstruction of bowel lumen distal to fistula.
7. Biliary or pancreatic in origin.
8. Tuberculosis.
9. Malignancy of bowel or of adjacent structures with infiltration into bowel.
10. Prior radiation to bowel.

Fistulas of stomach, duodenal stump, biliary pancreatic, fistulas with long tracts, low output, no radiation, no distal obstructions to bowel like malignant growth, foreign body/ stricture in the lumen, no adjacent abscesses will heal spontaneously over a period of time.^[5,6]

Fistulas of lateral wall of duodenum, upper jejunum, ileum and colon, fistulas with high output, following radiation, malignancy, with distal obstruction are less likely to heal spontaneously.^[5,6] 5 to 20% of fistulas may heal without definitive surgical procedure while 75 to 80% heal with a definitive procedure.^[6]

The dangers of a fistula are;^[7]

1. Loss of fluid and electrolytes.
2. Contamination of peritoneal cavity and sepsis and organ damage.
3. Excoriation, ulceration and scarring of skin adjacent to fistula due to outpouring of acidic/alkaline fluid.
4. Malnutrition.

So once a fistula manifests, measures to decrease the output, to combat sepsis and to protect skin are to be enforced. Patient should be kept nil by mouth, total parenteral nutrition should be started. Anaemia, hypoproteinaemia corrected. Barrier creams containing zinc, sucralfate should be applied as thick coat around the fistula,

collecting stoma bags may be fixed, amount of output measured. Vacuum assisted dressings will prevent excoriation of skin and abdominal closure would be easy.^[8]

After stabilising the patient, investigations to find the cause of fistula should be carried. Ultrasound scan/CECT of abdomen to assess any free fluid/loculated fluid within the abdomen, fistulogram to know the length, size, number of tracts, connection to bowel.^[9]

If there are signs of sepsis/peritonitis, immediate diversion of the leaking bowel to exterior may be done. Stabilisation of patient continued.

Once the output is decreasing, enteral nutrition may be started. This would decrease sepsis and housekeeping of intestines would be carried.^[10] Transient increase in fistula output may be there following oral intake.^[11] TPN, IV fluids and diversion of loop, draining of abscess cavities, will improve and stabilise the patient.^[1,2,12] Definitive procedure may be carried 3 to 6 months later when all the inflammation of peritoneum would subside.^[11]

Sometimes, there may be spontaneous closure of fistula when favourable conditions are there. Fistulas that do not close spontaneously by 6 months are not going to close any more.^[6]

Definitive Treatment: Definitive treatment should be considered when patient is stable, fistula output is constant.¹ Fistulas that do not close by 6 months, would probably not close any further.¹ Temporary damage control surgery done also must be undone. Timing of definitive surgery should be planned unhurriedly, after stabilising the patient, when inflammation has subsided.¹ Abdomen should be entered from a virgin area. Small bowel loops must be meticulously separated from parietis and interloop adhesions, from ligament of Treitz to ileocaecal junction, the segment of bowel bearing the fistula must be isolated and excised followed by end to end anastomosis. Fistulous opening on abdominal wall must be excised. Multiple scarring on abdominal wall may pose problems for closure of abdomen.^[13]

Closure by means of biological mesh, polyglactin mesh or flap covers are all attempted. Lateral thigh flaps based on lateral circumflex artery, latissimus dorsi flaps are tried in combination with component separation and biological mesh.^[13] In our study, excision of fistulous tracts and stoma sites was done and abdomen closed. Following surgery, patient should be managed in ICU to prevent infection and organ damage. TPN and electrolytes, micronutrients supplementation, prevention of infection should be taken care of.^[14] The fistula closure rate following definitive procedure depends on general condition of patient, pre-existing disease like IBD, radiation enteritis, malignancy, peritoneal inflammation.^[6]

CONCLUSION: Enterocutaneous fistulas occur when surgery is attempted in a malnourished unfit patient. Multiple laparotomies increase the risk of damage to bowel during adhesiolysis. Anastomosis on unprepared colon increases the chance of leak. These often result in fluid,

electrolyte, nutritional imbalances, sepsis and death. They need dedicated team work for their successful management. High output fistulas have high mortality rate. The type of surgery, experience of the surgeon, comorbidities affordability of the patient all contribute to the outcome of patient.



Excision of Scars and Stoma Site



Fistulogram



Ileostomy



Post-operative ECF



Post-operative ECF2

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