Post operative enterocutaneous fistula: treatment and outcome experience in indian tertiary care hospital

Kumar A , Gola NK

Department of Surgery, Assistant Professor, Rama Medical College Hospital and Research Centre, Hapur, India 245304

Corresponding Author:Dr. Amit Kumar, Flat 105,Doctors Quarters, Rama Medical College Hospital and Research Centre, Hapur , India PIN 245304, Email: dramitkr@hotmail.com

ABSTRACT

Enterocutaneous fistula remains a dreaded and expensive postoperative complication following abdominal operations in our setting. The aim of the study is to describe our experience in the management of postoperative enterocutaneous fistulae, their causes, characteristics and treatment outcomes in our resource poor settings. This study was undertaken among patients of postoperative enterocutaneous fistula presenting in department of Surgery of a referral hospital in catering to mostly rural population in western Uttar Pradesh in the period February 2009 to October 2014. Twenty-eight patients were observed during the study period; eighteen males and ten females. Spontaneous closure of fistula occurred in 18 patients on conservative management, whereas 7 required repeat surgery for definitive closure with a overall closure rate of about 82 % . Five Patients died while undergoing treatment most commonly as a result of sepsis. Enterocutaneous fistulae pose a therapeutic and management challenge in our setting and requires multidisciplinary approach with proper resuscitation, maintaining fluid and electrolyte balance along with control of sepsis, nutritional support and properly timed surgery provides good results even under constrained conditions. Nursing support, control of effluents, skin protection and proper care is vital and assist in healing of enterocutaneous fistula.

Keywords: Complications/therapy, Conservative treatment, enteral nutrition, Enterocutaneous fistula, Postoperative Complications/surgery ,rural surgery

INTRODUCTION

Enterocutaneous fistula is a devastating complication of mishaps following operations on the intestinal tracts having high mortality and morbidity for the patients and takes a heavy toll on the surgeons. Treatment and management of enterocutaneous fistula remains an expensive proposition in developing countries. The cost of total parenteral nutrition (TPN) is so high that it renders its proper use not meaningful, many supportive treatments like Vacuum-Assisted Closure(VAC) remains unavailable and nursing care is in short supply. These deficiencies result in prolonged and difficult hospital stay[1,2]. Cooperation of patient's attendants and relatives is essential and very helpful in nursing the patient and overcoming the shortcomings. Despite the handicaps; good results can be obtained with low mortality and morbidity comparable to studies having better resources.

This study was undertaken to document the management and result of post operative enterocutaneous fistula in our setting. The principles of treatment remain the same with recognition of fistula occurrence and stabilization of patient, investigations to determine the cause and determine the possible course of treatment. Decision is made regarding approach. Definite therapy is undertaken depending upon anatomy and findings and followed by the healing phase ensuring adequate nutrition and maximize healing.[3]

MATERIALS AND METHODS:

This is a prospective study of 28 patients presenting with postoperative enterocutaneous fistulae were observed and analyzed in the duration of February 2009 to October 2014. All patients who presented with enterocutaneous fistula or those who were referred from elsewhere were included in the study. Approval was taken from the institutional Review Board for the study and all patients had given written informed consent for the treatment and inclusion in the academic study. Patients with enteroenteric, enterovaginal or enterovesical fistula were excluded from the study. Some patients included in the study had undergone initial treatment at peripheral hospital and subsequently referred to our institution following deterioration in condition or development of fistula or for economic reasons. The following information was taken from the charts- name, ages, sex, index operation, blood investigations and radiological studies for presence of abscess/collection, origin of the fistula, volume of content in the initial phase and subsequently variations in days and weeks, any surgical intervention received by the patient and the eventual outcome.

Patients with possibility of salvage by immediate surgical intervention or stoma creation were excluded

from the study. Immediate surgical intervention in enterocutaneous fistula may be fraught with risks arising from the persistent factors which resulted in the fistula in the first instance including poor general condition, poor tissue characteristics etc. Furthermore unnecessary delay in operation results in frozen peritonitis or fibrosis making dissection difficult and chances of multiple inadvertent enterotomies high. Antibiotics and anti-tubercular treatment was continued as appropriate.

The patients were under observation and the time of appearance of fistula was noted. Post operative leaks are evident with discharge of feculent or bilious content via mid-line or the drain usually in the 4th to 8th post operative day. This may be preceded by episodes of tachycardia, fever or hypotension and generalized anxiety and sometimes delay in passage of flatus or give an appearance of stitch abscess at the incision site. It is important to make an early diagnosis of leak and identify the site and extent of leak if possible.

Blood was taken at appropriate interval for serial assessment of hemoglobin, total leukocyte count, serum proteins levels, electrolyte and urea and LFTs(Liver function test) as needed. Some patients CRP(C-Reactive Protein) levels was available but not for all.

Upon recognition of fistula an assessment was made regarding total 24 hour output and attempt was made to turn it into a controlled fistulae. Fluid replacement was given in conjunction with enteral feeding where ever feasible and record of loss of body weight, urinary output, fistula output was tracked and compensated as per required. Nutritional support in high output stoma is critical. This can be achieved with the use or ORS(oral re-hydration solutions), avoiding hypotonic feeds, anti-diarrhoeal drugs like loperamide, jejunal refeeding and use of micronutrients supplementation.[4]

Nutrition was maintained with high carbohydrate and protein diet. Intravenous supplementation was done using 10% dextrose and Ringer's lactate alongside peripheral nutrition. Total parenteral nutrition was used in high output fistulae but it being expensive; this was not always feasible especially for longer durations. In patients with high output fistula an elemental diet was given with little complex sugars. Peripheral Parenteral Nutrition was used whenever available in the form of 10% dextrose, intralipid infusions and Amino acid solutions. Periodic assessment was made so as to rule out distal obstruction and enema was given as needed.

High output fistula results in diverse and potentially life-threatening acute electrolyte and acid-base disorders when ileostomy or fistula drainage increases. Either metabolic acidosis or metabolic alkalosis can occur, depending on the nature and duration of the losses.[5]

In case of doubt fistulogram or Gastrograffin dye study was done to determine site of leak and to find collection. This was supplemented by ultrasound studies or CT scans and any collection was drained either percutaneously or by open drainage.

Spontaneous closure by conservative management was inferred when the fistula closed following supportive treatment alone. Those not responding to such measures or taken up for surgery for closure were considered in Surgical Closure group. Outcome variables were tabulated as spontaneous closure, surgical correction and mortality.

Enterocutaneous fistula results in uncontrolled soakage of wound with difficulty in controlling dressing. Skin excoriation is quite common especially in case of high output fistula rich in bile and digestive enzymes with undigested food materials. Use of silver paints in layers was made so as to protect the skin around the fistula site along with use of proprietary Siloderm cream. Zinc oxide paste with egg white and groundnut oil was also used as a skin protective agent. Sump suction was fashioned using chest tube drains and gauze piece dressing and intermittent suction applied to improve the soakage and help in nursing. Precautions were taken to prevent skin excoriation and decubitus ulcer. VAC therapy is not available in our institution so that was not employed. Intermittent sump suction was employed in some patients with high output in which a chest tube with gauze pieces rolled over was used to control the fistula and to reduce abdominal wall inflammation. Extensive help and cooperation of patient's relatives and attendant was needed in caring for the patients besides the effort of nursing staff.

OBSERVATIONS

Of the 28 patients 18 were males and 10 females with the median age of 39.2 years (range 12 to 72 years). Most patients were younger than 30 years reflecting bowel tuberculosis and enteric fever as aetiology. The small bowel was the most common site usually the mid or distal ileum in the younger patients consistent with the etiology of tuberculosis or enteric perforation as the primary pathology 15/28 i.e.53.57%. In such cases anastomotic or perforation repair breakdown was the most common cause. Most of the patients were in the age range of 21 years to 30 years (28.6%). The age and gender variations are illustrated in Figure-1.

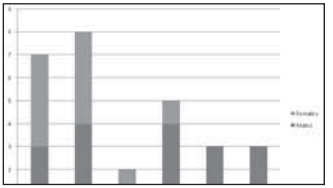

Fig.-1: Graph showing distribution of Males and Females in different age group in years presenting with enterocutaneous fistula.

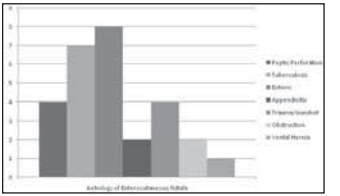

Fig. 2: Preliminary cause leading to enterocutaneous fistulae with number of patients shown in Y-axis.

All fistulae occurred following operative intervention for abdominal pathology in the postoperative period. In one patient the fistula was result of undetected or late manifesting ileal perforation following trauma from sharp object, wherein the other repairs done at the time of primary operation were intact.

Overall low albumin or deranged protein ratio was quite common- present in 14 out of 28 patients as was anemia –present in 15 out of 28 patients at the time of detection.

4 patients had fistula arising from the duodenum following failure of patch repair having very high output fistula initially (>500 ml in 24 hours) which slowly came down and resolved in about 24-41 days. The incidence of skin excoriation and redness of exposed abdominal wall or muscles was quite common despite of extensive use of silver paint and zinc oxide paste affecting mainly the high output fistula patients(n=15) having effluents from proximal gut.

Treatment of patients is complex and SOWATS guidelines is very helpful. It consists of following components: Sepsis management, optimization of nutritional state wound care, delineation of Anatomy of fistula, timing of surgery, and surgical strategy.[4] This is quite similar to that advocated by Fischer et al earlier.[3]

Small bowel esp. distal ileum was the most common site of origin of the fistula given that most occurred following failure of enteric perforation repair(8 cases) or tubercular perforation repair(7 patients) or end to end anastomosis.3 patients developed fistula following operation for appendicitis or gangrene in caecal area. In one case the caecal base was gangrenous and the limited ileo-ascending anastomosis leaked on the 10th post operative day. He was managed conservatively and healed on the 12th on supportive treatment. Two patients were referred from peripheral hospitals following leak. One patient died due to sepsis and the other recovered well. The aetiology and preoperative diagnosis of enterocutaneous fistula are shown in Figure-2.

One case of fistula occurred following ileostomy closure in patient of previous tubercular abdomen with ileal perforation which was amenable to conservative treatment.

Fourteen patients needed blood transfusion either packed RBC or whole blood for anaemia and build up the patient. The requirement varied from 2 units to 8 units over the recovery period.

Five patients expired in the period following occurrence of post operative fistula in duration of 45 days. The deaths were mainly ascribed to sepsis.

Eighteen patients had spontaneous closure of intestinal fistula with the average time of 25.33 days varying from 6 days to 41 days. Seven patients failed to respond to conservative treatment and needed operative management. The operation included lysis of adhesions and resection of ECF(Entero Cutaneous Fistulas) in 4 patients, pyloric exclusion and diversion in one patient with duodenal fistula. Of them 4 were cured and 1 had recurrence which resolved on further conservative treatment. Two patients had further surgery but succumbed to their disease.

There were 18 patients having low or moderate output fistula and 10 having high output fistula given that most of the cases were due to small bowel at the time of initial presentation which reduced over the treatment period (Ileum was the most common site). The mean fistula output was about 550ml with output varying from 150ml to 1200ml in 24hours during the initial days with sharp tapering in output when the fistula was about to heal.

Significant intra-abdominal collection was seen in 15 patients (53.8%) especially in paracolic gutters and pelvis which had to be drained either under USG guidance or the abdominal incision area as most patients had wound dehiscence.

The rate of spontaneous closure varies from 23% to 80% depending upon the study; in our series there was closure

rate of about 64%.[5] Surgery was successful in five out of seven patient taken up after resuscitation and perceived failure of conservative treatment. Overall mortality following ECF varies from 6.5%to 48%; in this study the mortality was 17.85%.[6,7,8]

DISCUSSION

Enterocutaneous fistula remains a life threatening complication of bowel surgery either in emergency or routine settings. The treatment is complicated by limited means and economically deprived settings common in our country.

In the present series all cases developed enterocutaneous fistula as a postoperative complication or following trauma.

Eighteen males and ten female patients were studied. All patients were treated initially conservatively after assuring that there were no distal blockages, effluents were manageable, bowel healthy with absence of foreign bodies. The healing rate achieved for the entire group was 82% comparing favorably with the results obtained in other centers.[7,9] In this study many patients were referred from other hospitals for ease of management(n=16) and most referrals were quick unlike those seen by Owen and colleagues.[10]

In India more cases are seen in postoperative patients operative for perforation peritonitis or obstruction as compared to western literature where ECF is commonly associated with Crohn's disease, diverticulitis or following Colonic cancer resection; the most common reason was infectious disease involving small gut and its postoperative complications. Anastomosis breakdown was the most common cause.[3,6,9,11]Pritts et al have divided the expected treatment course of enterocutaneous fistulae into five overlapping ,but sequential phases similar to what is described by Ruben GJ et al as SOWATS method.[3] (Table-1)

In our study the most common cause of enterocutaneous fistula was post operative breakdown of anastomotic repair. The probable cause were technical defect in the method of repair, poor general condition of the patient reflected by number of patients with low albumin levels and poor nutritional levels. Quite a number of patients present late in the disease process and it is difficult to salvage them. In some cases poor choice of operation may be responsible. Prolonged hypotension and requirement of inotropic support may be associated with leak following duodenal perforation omental patch repair.

Nonoperative management of ECF requires patience and ability to deal with associated complications. Some studies have shown a spontaneous closure rate of 57%.[12] Some studies have advocated early surgical intervention in case mix quite similar to ours with good results.[13,14]

Lynch AC et al found a recurrence rate of 20.5% within 3 months of operative treatment for EAF/ECF in a retrospective study of 205 patients. In this series there was single recurrence associated with ventral hernia at about 7 months time.[15]

Appendicectomy is considered an easy operation and can result in fistula if not properly managed. It is advisable to manage the complications in a better equipped center.[16]

Nutrition plays a central role in the effective management

Table-1: Planning for resuscitation by stage and approximate time period

1. Recognition and Stabilization	24–48 hours	Correct fluid and electrolyte imbalances stabilization Drainage of intra-abdominal abscesses Control of sepsis control of fistula drainage Ensure adequate skin care Aggressive nutritional support
2.Investigation	after 7–10 days	Determine anatomy and fistula characteristics
3.Decision	up to 4–6 weeks	Determine likelihood of spontaneous closure Plan course of therapy
4.Definitive therapy	after 4–6 weeks or if closure is Closure of fistula unlikely	Reestablish gastrointestinal continuity Secure closure of abdomen
5.Healing	5–10 days after closure onward	Ensure adequate nutritional support Transition to oral intake

of ECF. The decision of enteral versus parenteral delivery systems remains controversial is largely dictated by the nature of the fistula and the nutritional status of the patient.[17] The use of nutritional support is one of key factors in management of patients with ECF. This can be done by enteral feeding with high carbohydrate diet with elemental diet. Total parenteral nutrition could not be provided to all patients all the time due to resource constraints though it was used occasionally. Octreotide or fibrin glue was not used in our study due to sporadic availability and the cost involved though it has been used by others with great effect while some have found the effects to be equivocal. [14,18]

VAC therapy has been used with excellent results but the commercial products available is quite expensive. improvised suction drain was used in some patients with high output fistula in a manner similar to that illustrated by Rabinovici et. al. and was very helpful.[19,20]

The rate of spontaneous closure varies from 23% to 80% in various studies; in our series it was 64.2% with a mortality of 17.85% which is in lower range of other observations.[9,12]

CONCLUSION

Most uncomplicated enterocutaneous fistula will close spontaneously when properly managed conservatively even in constrained conditions seen in our settings. Surgery is usually not an immediate priority except to deal with complications. Spontaneous closure of fistula is likely in cases of low output and distal enteric contents and having no other complications. However, when surgical intervention is required to deal with the fistula resection and anastomosis or bypass procedures are the preferred surgical procedures. Suturing of the fistula is tempting but almost always futile and hence not recommended.

REFERENCES:

1. Davis KG, Johnson EK. Controversies in the care of the enterocutaneous fistula. *Surgical Clinics of North America*. 2013 Feb 28;93(1):231-50.
2. Sreedharan N, Vinitha M, John P, Girish T, Vijayanarayana K, Gabriel R. Utilization Of Total Parenteral Nutrition In A South Indian Tertiary Care Hospital. *Value in Health*. 2014;17(7)
3. Pritts TA, Fischer DR, Fischer JE. Postoperative enterocutaneous fistula *Holzheimer RG, Mannick JA, editors. Surgical Treatment: Evidence-Based and Problem-Oriented* . Munich: Zuckschwerdt; 2001.
4. Nightingale JM. The medical management of intestinal failure: methods to reduce the severity. *Proc Nutr Soc*. 2003 Aug; 62(3):703-10.
5. Weise WJ, Serrano FA, Fought J, Gennari FJ. Acute electrolyte and acid-base disorders in patients with ileostomies: a case series. *Am J Kidney Dis*. 2008;52(3):494–500.
6. Visschers RG, Damink SW, Winkens B, Soeters PB, van Gemert WG. Treatment Strategies in 135 Consecutive Patients with Enterocutaneous Fistulas. *World J Surg*. 2008; 32:445–453
7. Kaur N, Minocha VR. Review of a hospital experience of enterocutaneous fistula. *Trop Gastroenterol*.2000 Oct-Dec; 21(4):197-200.
8. Chalya PL,Mchembe M, Gilyoma JM, Mabula JB,Mawala B,Mona L Enterocutanesous Fistula: a Tanzanian experience in a tertiary care hospital; *West and Central African Journal of Surgery*. 2010; 15(2):104-112.
9. Taggarshe D, Bakston D, Jacobs M, McKendrick A, Mittal VK. Management of enterocutaneous fistulae: A 10 years experience. *World J Gastrointest Surg*. 2010 Jul 27; 2(7):242-6.
10. Owen RM, Love TP, Perez SD, Srinivasan JK, Sharma J, Pollock JD, Haack CI,Sweeney JF, Galloway JR. Definitive surgical treatment of enterocutaneous fistula: outcomes of a 23-year experience. *JAMA Surg*. 2013 Feb; 148(2):118-26.
11. Kumar P, Maroju NK, Kate V. Enterocutaneous Fistulae: Etiology, Treatment, and Outcome – A Study from South India. *Saudi J Gastroenterol* 2011; 17(6): 391-395.
12. LaBerge JM, Kerlan RK Jr, Gordon RL, Ring EJ. Non-operative treatment of enteric fistulas: results in 53 patients. *J Vasc Interv Radiol*. 1992;3(2):353–357.
13. Sheikh AR, Malik AM, Sheikh GA. Feasibility of early surgical intervention in postoperative entero-cutaneous fistulae. *J Ayub Med Coll Abbottabad*. 2010; 22(4):37-40.
14. Chaudhuri Col Rajan . The Challenge of Enterocutaneous Fistulae *MJAFI*. 2004; 60:235-238.
15. Lynch AC, Delaney CP, Senagore AJ, Connor JT, Remzi FH, Fazio VW. Clinical outcome and factors predictive of recurrence after enterocutaneous fistula surgery. *Ann Surg* 2004;240(5):825–831.
16. Njeze GE, Achebe UJ. Enterocutaneous fistula: A review of 82 cases. *Niger J Clin Pract*. 2013;16:174-7.
17. Dubose JJ, Lundy JB. Enterocutaneous fistulas in the setting of trauma and critical illness. *Clin Colon Rectal Surg*. 2010 Sep;23(3):182-9.
18. Draus JM Jr, Huss SA, Harty NJ, Cheadle WG, Larson GM. Enterocutaneous fistula:are treatments improving? *Surgery*. 2006 Oct;140(4):570-6.
19. Medeiros A, Aires-Neto T, Marchini J, Brandao-Neto J, Valenca D, Egito E. Treatment of postoperative enterocutaneous fistulas by high-pressure vacuum with a normal oral diet. *Digestive Surgery*. 2004; 21(5-6): 401-405.
20. Rabinovici R, Reissman P, Eid A, Berlatzky J, Krausz M. New sump suction appliance for drainage of enterocutaneous fistulae. *Br. J Surg*. 1988;75:415-7.