



Management and Outcome of Enterocutaneous Fistula in an Urban Centre in Nigeria

A.I. Ugochukwu, O. Amu and M A. Nzegwu

Consultant Surgeon Enugu State, University Teaching Hospital Enugu, Nigeria

Consultant Surgeon Enugu State

University Teaching Hospital Enugu, Nigeria

Consultant Pathologist, University of Nigeria Teaching Hospital Ituku, Nigeria

Email : aiugochukwu@yahoo.com

ABSTRACT

66 patients admitted into Enugu State University Teaching Hospital (ESUTH) with enterocutaneous fistula between January 1998 and December 2008 (a ten year period) was reviewed retrospectively. 45 (68%) of the patients were females and 21 (31.8%) were males. The ages ranged from 3 years to 68 years with peak age-range of 30-39 years. 30 (45.5%) followed laparotomy for ileal typhoid perforation, 15 (22.7%) followed laparotomy for intestinal obstruction and of this 8 cases (12.1%) were for intestinal obstruction secondary to colonic malignancies. 7 (10.9%) followed laparotomy for penetrating abdominal injuries, 6 (9.1%) followed post-appendectomy, 4 (6.1%) followed laparotomy for TB abdomen that mimicked intestinal obstructions or peritonitis clinically, 2 (3%) followed laparotomy for perforated duodenal ulcer and 2 (3%) followed traditional healers incision into an inguinal and a femoral hernia. 53 (80.3%) cases were referred from peripheral hospitals. 11 (16.7%) followed laparatomies done in our hospital mostly by surgical residents, while 2 (3%) were admitted into our hospital following traditional healers' incision into an inguinal and a femoral hernia. 45.5% of patients had high output fistula, 28.8% had moderate output fistula and 25.7% had low output fistula. 49 (74.2%) of patients healed spontaneously on conservative management, 5 (7.6%) died during the resuscitation period. 12 (18.2%) required surgical intervention 4 (6.1%) died following surgical intervention, giving an overall mortality of 13.7%. The hospital stay ranged from 14 to 160 days with average hospital stay 92 days. The main cause of enterocutaneous fistula in our environment was post-operative, accounting for 64 (97%) with laparotomy for ileal typhoid perforation alone accounting for 45.5% of the cases.

KEYWORDS: Enterocutaneous fistula, aetiology, management, outcome, Enugu.

INTRODUCTION

Enterocutaneous fistula remains a formidable and major surgical problem worldwide, and despite medical advances in the past two decades it is still attended with significant potential for morbidity and mortality. Every surgeon who operates in the abdominal cavity fears complications but perhaps none more than the development of enterocutaneous fistula. This study is to review the aetiology and management of enterocutaneous fistula in our environment. We will also highlight our limitations in its management in our environment.

Enterocutaneous fistula is an abnormal tract which communicates between the intestinal mucosa and skin. There are many classification systems for intestinal fistulas which depend on anatomical, physiological and a etiological system [1]. The physiological classification is based on their output over 24 hours and has a bearing on management. High output fistula produced more than 500ml/24h and lead to considerable difficulties with fluid and electrolyte management and skin care. These general originate from the small bowel and patient may require total parenteral nutrition (TPN) and may subsequently require surgical intervention for its closure. Moderate output fistulas produce 200-500ml/24h. Some of these will behave like high output requiring TPN, may subsequently require surgical intervention for its closure and others will do well on oral feeding and may heal spontaneously. In contrast low output fistula produce less than 200ml/24h and are generally of colonic origin and patient may be able to tolerate oral intake and mostly will heal spontaneously on conservative management. Enterocutaneous fistula can be of simple type with direct communications between gut and skin or of complex type with multiple tracks with or without intervening abscess

cavity and/or involving other organ systems. Despite all medical advances over the past 2 decades, the management enterocutaneous fistula still remains a challenge and carries a mortality rate of up to 10% [2].

The majority of intestinal fistula (75%-85%) are iatrogenic occurring in the post-operative period following anastomotic dehiscence [3]. They arise following emergency abdominal surgery for intestinal obstruction, inflammatory bowel disease or cancers [4,5] 15%-25% of fistula occur spontaneously from underlying Crohn's disease, diverticular disease or intrabdominal malignancy or following pelvic radiotherapy with ensuing radiation enteritis. These fistula tend not to close spontaneously and generally will require surgical intervention. The triad of sepsis, malnutrition and fluid/electrolyte disturbance is the greatest determinant of mortality [6]. Management of enterocutaneous fistula can at times be formidable and challenging especially the high output type. The initial management of these patients is aimed at correction of fluid and electrolyte disturbances, control of sepsis and nutritional support to combat hyper- catabolic state and prevent malnutrition. The skin care around the external stoma of fistula is also of utmost importance, so as to limit the inevitable skin excoriation and maceration. In most cases open surgical intervention at this stage is fraught with danger and failure and the urge for surgical intervention must be resisted. However, in cases that occur early in the post-operative period suggesting technical error, immediate open surgical intervention may be necessary in a patient who is fit [7]. In favourable circumstances 60%-70% of fistula will heal spontaneously within six weeks of conservative management [8]. Regardless, if the fistula has not closed within 6 weeks in response to conservative measures, then it is unlikely to do so without surgical intervention. Operative intervention is reserved for these cases and at surgery, it is often possible to ascertain the reason for the fistula failing to close spontaneously e.g. ongoing intra-abdominal sepsis, distal obstruction, complete disruption of bowel lumen, multiple tracts, intra-abdominal malignancy or chronic granulomatous lesions like Crohns disease, and tuberculosis.

PATIENTS AND METHODS

This is a retrospective study of all cases of enterocutaneous fistula seen and managed in ESUT Teaching Hospital from 1999 to December 2008 (a ten year period). The case notes of patients clinical findings, causes of enterocutaneous fistula and outcome were collected and analyzed by simple methods and discussed. Three patients were excluded because inadequate or incomplete information.

RESULTS

Out of 66 cases analyzed 45 (68.2%) were females and 21 (31.8%) were men, giving a female/male ratio of 2:1 to 1. The ages ranged from 3 years to 68 years with peak age-range incidence of 30-39 years. 53 (80.3%) were referred cases, 30 (45.5%) cases occurred following laparotomy for ileal typhoid perforation, 15 cases (22.7%) followed laparotomy for intestinal obstruction and of this 8 cases (12.1%) were for intestinal obstruction secondary to intra-abdominal malignancies. 7 cases (10.9%) followed laparotomy for penetrating abdominal injury, 6 cases (9.1%) followed post-appendectomy, 4 cases (6.1%) followed laparotomy for TB abdomen that mimicked intestinal obstruction or peritonitis clinically. 2 cases (3%) followed laparotomy for perforated duodenal ulcer whilst 2 cases (3%) followed incision into a femoral and an inguinal hernia by traditional healers. The common clinical findings were high output faecal discharge in 30 patients (45.5%) and moderate output faecal discharge in 19 patients (28.8%) and low output faecal discharge in 17 patients (25.7%), dehydration in 56 (84.8%) patients, hyponatraemia in 45 (68.2%) patients, anaemia in 52 (78.8%) patients, and skin excoriation and maceration in 55 (83.3%) patients. There was evidence of wide cutaneous opening in 12 (18.2%) patients, 6 (9.1%) patients had mucous membrane lining the fistulous tract. 35 (53%) patients had barium meal and follow through studies which showed distal obstruction in 8 (12.1%) patients. 24 (36.5%) patients had fistulogram which showed simple tracks in 16 (24.2%) patients and complex tracks with abscess cavities in 8 (12.1%) patients. 49 (74.2%) patient had abdomino-pelvic ultrasound of which 12 (18.3%) patients showed intra-abdominal abscesses. Due to its unavailability we did not use CT scan in our study. 57 (80.4%) had serial serum albumin and transferring level studies. 49 (74.2%) of our patients had their fistula heal spontaneously on conservative management, 5 patients (7.6%) died during the resuscitation period. 12 patients (18.2%) required surgical intervention. (6 of these patients had surgery in the immediate post fistulation period and the other 6 patients had surgical intervention 2 to 4 months post fistulation), 4

(6.1%) of patients died following surgical intervention (two following early surgical intervention and two patients following delayed surgical intervention). This gives overall mortality of 13.7%. The average hospital stay was 92 days.

DISCUSSION

The development of intestinal fistula following surgery is a devastating complication for the patient and their family. Despite medical advances over the past two decades, enterocutaneous fistula still carries a significant potential for morbidity and mortality [2]. The majority of intestinal fistulas (75% to 85%) are iatrogenic, occurring in the post-operative period following an anastomotic dehiscence following emergency abdominal surgery [3]. In our series 97% of cases occurred following surgery and is in consonance with other reports [4,5]. Two cases (3%) followed traditional healers' incisions into a femoral hernia and an inguinal hernia. This is unheard of in developed countries. Traditional healers induced enterocutaneous fistula has been reported elsewhere in West Africa [9]. Crohn's disease, diverticular disease, bowel ischaemia and radiotherapy with resultant radiation enteritis as aetiologies of enterocutaneous fistula are rare occurrences in our environment. None of these was seen in our series but the high rate of enterocutaneous fistula following laparotomy for ileal typhoid perforation reflects the high incidence of typhoid perforation in our environment. Reports also indicate a rising incidence of typhoid enteritis and its dreaded complication of ileal perforation in our environment. Our (9.1%) incidence of enterocutaneous fistula post-appendicectomy is high when compared to its rarity in Western world [10,11]. However, reports from Maiduguri, Northern Nigeria indicate that post-appendicectomy induced enterocutaneous fistula is the commonest cause of enterocutaneous fistula [12]. This reflects perhaps the level of surgical practice in that part of the world where there is a paucity of trained surgical personnel. 6 cases of TB abdomen with associated enterocutaneous fistula seen in this series reflect the still high prevalence of this disease in our environment. The fact that majority of our patients were referred cases from peripheral and rural hospitals reflects the low level of surgical practice and competence in our environment. Most doctors in peripheral and rural hospitals are general practitioners with limited surgical experience and exposure. This calls for a National Policy on surgical care delivery system, so as to improve the quality of surgical training and care in our environment. Also of note is the fact that factors contributing to anastomotic leaks or breakdown of gut closure following laparotomy for typhoid perforation which include malnutrition, sepsis, anaemia and occasionally immunosuppression, in addition to poor surgical technique are more clearly obvious in our environment. Most of these patients need vigorous treatment with correction of these deficiencies before surgery is undertaken. Anastomosis in presence of gross bacterial peritonitis is fraught with danger and must be resisted. Patients who present with enterocutaneous fistula have similar clinical pictures of fluid and electrolyte imbalance, with dehydration, hyponatraemia, hypochloreaemia, hypercatabolic state, hypoalbuminaemia, anaemia as well as severe sepsis in most cases. A very useful acronym used in many centres and in our own centre in the management of patients with enterocutaneous fistula is 'SNAP', S is for control of sepsis and appropriate skin care. N is for nutrition ideally via the enteral route (if not then parenteral or combination of both) A to define the underlying anatomy. P is for definitive plan to deal with the fistula. Our initial plan is vigorous correction of fluid and electrolyte disturbances and control of sepsis. Several studies indicate that ability to control sepsis is the most important determinant of outcome in patients with enterocutaneous fistula and uncontrolled intra-abdominal sepsis [13]. The majority of deaths from intestinal fistula are related to uncontrolled intra-abdominal sepsis which lead to increased catabolism, ongoing nutritional losses and impaired immune function and such fistula will not close spontaneously. In our series, for control of sepsis we use intravenous broad spectrum antibiotics and monitored progress with clinical signs and serial abdomino pelvic ultrasound studies. Since we do not have facilities for ultrasound or CT Scan guided percutaneous drainage of intra-abdominal abscess, we resort to open drainage in a select group of patients who do not respond to I.V. broad spectrum antibiotics. These groups of patients are the ones that had early open surgical intervention following the development of enterocutaneous fistula. In our series, 6 patients underwent this procedure with two mortalities. Skin protection is a critical part of care pathway. The fistula effluent may be acidic or alkaline and very quickly lead to skin excoriation, the enzymes within the enteral succus may digest the abdominal wall leading to maceration. We do not have the services of trained enterostomal therapist, but we employ the services of our surgical

nurses in this regard. We apply zinc oxide paste on the skin around the fistula and this was quite effective in tackling the sometimes troublesome skin excoriation. Colostomy bags are usually applied to collect the faecal discharges, though usually expensive, are available and we encourage our patients to provide them. Whilst dealing with sepsis and skin care, we institute measures to ensure that the patients' nutritional needs are met. Since in majority of our patients, the gastrointestinal tract is in continuity with no distal obstruction we institute enteral feeding. Even in cases, where the fistula output is very high with difficulties in wound management, we persist with enteral feeding because of unavailability of proprietary parenteral nutrition fluids which is the bedrock of management of high output fistula in developed countries [14]. Levy *et al.* [15] had successfully treated high out fistula in their series with enteral feeding only with excellent results. Our enteral feeding consists of high protein milk drinks like complan and caselin as well as fluid diets like custard, pap etc. These fluid diets have grinded groundnuts, soyabean and crayfish as added supplements. These fluid supplements are prepared by our dieticians taking all necessary steps to meet the nutritional demands of individual patients. These fluid diets with added supplement are taken orally but in a few patients because of their poor general condition and debility their enteral feeding was via nasogastric feeding tube [16]. Two of our patients with mid jejunal fistula with mucus fistula confirmed to be distally patent on barium studies were successfully treated with fistuloclysis using our locally made fluid diet. Fistuloclysis has been successfully used by other workers [17]. Duodenal and proximal jejunal fistula are not suitable for enteral feeding. In two of our cases with duodenal fistula, we inserted jejunostomy feeding tube under local anaesthesia and fed the patient with our local enteral feeds outlined above. However, we lost one of the patients due to continuing sepsis. More recently our local pharmaceutical industries have developed, protein supplement formulation, astymin SN which is amino acid supplements that is given intravenously. We used this supplement extensively on our patients, but its usefulness can best be determined by a prospective controlled trial. Luckily most of the enterocutaneous fistula seen in our environment involves the distal ileum and below and even in high output ileal fistula most of these ingredients in our locally manufactured enteral feeds will get absorbed before it get to the distal ileum [18]. Moreover, most cases of enterocutaneous fistula in our environment are acute conditions with the viability of most of the gut mucosa fairly intact such that absorption is minimally impaired. We did not use stomatostin analogues in our series because of its unavailability, though its use in intestinal fistula is controversial [10] [19]. Under the conservative management outlined, 49 (74.2%) of patients fistulae healed spontaneously. This finding is in consonance with other studies [20, 21]. In 6 (9.1%) patients the fistulas did not close spontaneously at six weeks in response to conservative management, surgical intervention was then planned. Fistulogram revealed evidence of persistent abscess cavity in five patients, two of which had complex fistulae. Barium meal and follow through revealed distal ileal obstruction in a patient with extensive TB abdomen. Abdomino-pelvic ultrasound confirmed the abscess cavities in the five patients. CT scan abdomen was not done due to its unavailability. CT scan is useful in assessment of complex fistulae and or tumour mass for operability. Surgical operations for these patients were done between two to five months after failure of fistula to close. Surgery consisted of exploratory laparotomy, resection and anastomosis of healthy segments of gut provided gross sepsis is absent, excision of the fistulous tract and drainage of the abscess cavities. Two patients with multiple opening of the fistula on the skin which made control of fistula effluent difficult and who had multiple matted gut making dissection hazardous and dangerous, had proximal ileostomies fashioned, as a first stage operation. Second stage surgery involved ileo-ileal reanastomosis and excision of all fistulous tracks. The two patients had excellent results. Two patients of the six that had surgical intervention died post-operatively, one following TB abdomen with HIV infection and the other died of continuing sepsis with HIV infection and associated intra-abdominal malignancy. Long stay in hospital is associated with heavy financial burden on the patients in our environment because National Health Insurance Scheme is still in its infancy and was not available to majority of our patients. Those patients who stabilized on conservative management and could actually be managed at home were unwilling to be discharged home because of the stigma enterocutaneous fistula has in our society. Secondly, there are no community care nurses or enterostomal therapist that can be engaged for home visits. Also most of the patients especially the young ones were very much depressed and very dependent. There are very few psychologists to support our patients who are depressed especially in the early stages of their illness. Happily many of them regain their self esteem when the fistula output began to lessen. Other

factors which make management of enterocutaneous fistula difficult in our environment is the non-availability of proprietary parenteral nutrition fluids. Our recourse to enteral fluid nutrition even in high output fistula, where parenteral nutrition is clearly indicated no doubt prolong the time for spontaneous healing of the fistula and therefore prolonged the hospital stay with its heavy financial burden on the patient. The high cost of colostomy bags also add heavy financial burden on the patients. The bags are not always available when needed making the management of external opening of fistula and associated skin excoriation and maceration cumbersome and messy. Another draw back for us is the recourse to open surgical instead of minimally invasive procedure such as ultrasound or CT scan guided percutaneous drainage of intrabdominal abscess, in the face of overwhelming and uncontrollable sepsis with its attendant considerable inflammatory 'second hit' response that would be generated by surgical intervention. Secondly, most of these patients are in such catabolic stage that very quickly leads to multi-organ failure and death. We lost two of our six patients who had early surgery. Another seeming draw back in our series is the fact that we did not use somatostatin analogue octreotide, though it used in patients with enterocutaneous fistula is now controversial. However, the consensus is that in a percentage of patients it will reduce the time for fistula to closure, reduce fistulous output and thereby aid wound management [19]. The main causes of death in our series were continuing sepsis on patients with persistent hypoalbuminaemia, leading to malnutrition in patients that are unable to eat due to anorexia and extreme weakness in spite of vigorous treatment. Also HIV infections and tuberculosis were contributory. 13.7% mortality recorded in our series is in agreement with studies done elsewhere [2]. 5 patients died in the resuscitation period from overwhelming sepsis with persistent hypoalbuminaemia. Two patients died following early surgery in the face of continuing sepsis uncontrolled by IV broad spectrum antibiotics. One of them had associated HIV infection in association with TB abdomen and the other died of continuing sepsis and associated intra-abdominal malignancy. Our study found serum albumin and transferrin were predictive of mortality. As shown by Fazio *et al.* [22] all the patients that died have serum albumin less than 2.5g/dl. Also serum transferrin was very low in all the patients that died. Our finding is in consonant with studies done elsewhere [23].

Table 1: Age Range and Gender Distribution of 66 Cases of ECF

AGE RANGE	FEMALE	MALE	TOTAL	PERCENTAGE
1-9	4	-	4	6.1%
10-19	7	4	11	16.7%
20-29	10	3	13	19.7%
30-39	15	7	22	33.3%
40-49	3	3	6	9.1%
60-69	2	2	4	6.1%
Total	45	21	66	100%

Table 2: Aetiology Of ECF in the 66 Cases as Seen in Our Environment

S/NO	AETIOLOGY	FREQUENCY %
1	Post-laparotomy for typhoid perforation	30 (45.5%)
2	Post-laparotomy for intestinal obstruction	15 (22.7%)
3	Post-appendicectomy	7 (10.9%)
4	Post-laparotomy for penetrating abdominal injury	6 (9.1%)
5	Post-laparotomy for TB abdomen	4 (6.1%)
6	Traditional healers' incision into femoral and inguinal hernias.	2 (3%)
7	Post-laparotomy for perforation duodenal ulcer	2 (3%)
	Total	66 (100%)

CONCLUSION

The main cause of enterocutaneous fistula in our environment is iatrogenic (post-operative) (94.4%) with laparotomy for ileal typhoid perforation accounting for (45.5%) of cases followed by laparotomy for intestinal obstruction (22.7%), next was appendicetomy (10.9%), followed by laparotomy for

penetrating abdominal injury (9.1%), then followed by laparotomy for TB abdomen (6.1%), 2 cases (3%) caused by traditional healers' incision is uncommon elsewhere and unheard of in developed countries. Majority of cases were managed conservatively with spontaneous healing in (74.2%) of cases. Our management methods of enterocutaneous fistula are discussed and modern methods of management highlighted. The handicaps in management of enterocutaneous fistula in our environment are also highlighted.

REFERENCES

- [1] Berry SM, Fischer JE. (1996). Classification and pathophysiology of enterocutaneous fistulas. *Surg Clin North Am*; 76:1009-18.
- [2] Draus JM Jr, Huss SA, Harty NJ, Cheadle WG, Lavson GM. (2006). Enterocutaneous fistula: are treatments improving? *Surgery*. 140:570-6; 576-8.
- [3] Berry SM, Fischer JE. (1994). Enterocutaneous fistulas. *Curr Prob Surg*. 31:469-566.
- [4] Fischer JE. (1983). The pathophysiology of enterocutaneous fistula. *World J Surg*. 7:446-50.
- [5] Chintapatta S, Scott NA. (2002). Intestinal failure in complex gastrointestinal fistulae. *Nutrition*. 18:91-6.
- [6] Joyce M, Dietz D. (2009). Management of complex gastrointestinal fistula. *Curr Prob Surg*. 2 46:5:379.
- [7] Joyce M, Dietz D. (2009). Management of complex gastrointestinal fistula. *Curr Prob Surg* 46:5:378.
- [8] Datta V, Windor AC. Surgical management of enterocutaneous fistula. *Br J Hosp Med (Lond)* 2007; 68:28-31.
- [9] Traditional healer.
- [10] Killelea BK, Arkovitz MS. (2006). Perforated appendicitis presenting as appendicoumbilical fistula. *Pediatr Int*. 22:286-8.
- [11] Agrawal V, Prasad S. (2003). Appendico-cutaneous fistula: a diagnostic dilemma. *Trop Gastroenterol*. :24:87-9.
- [12] Eni UE, Gali BM. (2007) Aetiology, management and outcome of enterocutaneous fistula in Maiduguri, Nigeria, *Nig J Clin Pract*. 10:47-51.
- [13] Bosscha K, Hulstaert PF, Visser MR, Vroonhoven TJ, van der Werken C. (2000). Open management of the abdomen and planned re-operation in severe bacterial peritonitis. *Eur J Surg*. 166:44-9.
- [14] Rombeau JL, Rolandelli RH. (1987). Enteral and parenteral nutrition in patients with enteric fistulas and short bowel syndrome. *Surg Clin North Am*. 67:551-71.
- [15] Levy E, Frileux P, Cugnenc PH, Honiger J, Ollivier JM, Pare R. (1989). High output external fistulae of the small bowel: management with continuous enteral nutrition. *Br J Surg*. 76:676-9.
- [16] Ham M, Hortonk, Kannitz J. Fistuloclysis: (2007). Case report and literature review. *Nutr Clin Pract*. 22:553-7.
- [17] Mettu SR. (2004). Fistuloclysis can replace parenteral feeding in the nutritional support of patients with enterocutaneous fistula. *Br J Surg*. 91:1203.
- [18] Torres AJ, Landa JJ, Moreno-Azcoita M, Arguello JM, Silecchia G, Gastro J, et al. (1992). Somatostatin in the management of gastro intestinal fistula. A multicenter trial. *Arch Surg*. 27:97-9, discussion 100.
- [19] Scott NA, Finnegan S, Irving MH. (1993). Octreotide and post-operative enterocutaneous fistulae: a controlled prospective study. *Acta Gastroenterol Belg* 56:266-70.
- [20] Sancho JJ, di Costanzo J, Nubiola P, Larrad A, Beguiristain A, Roqueta F, et al. (1995). Randomized double blinded placebo-controlled trial of early octreotide in patients with post-operative enterocutaneous fistula. *Br J Surg*. 82:638-41.
- [21] Evenson AR, Fischer JE. (2006). Current management of enterocutaneous fistula. *J Gastrointest Surg*. 10:455-64.
- [22] Fazio VW, Coutsoftides T, Steiger E. (1983). Factors influencing the outcome of treatment of small bowel cutaneous fistula. *World J Surg*. 7:481-8.
- [23] Kurshinoff BW, Brodish RJ, Mcfadden DW, Fischer JE. (1993). Serum Transferrin as a prognostic indicator of spontaneous closure and mortality in gastro intestinal cutaneous fistula. *Ann Surg*. 217:615-22: 622-3.