

## EARLY CLOSURE VERSUS ORAL FEEDING FOR EXTERNAL GASTROINTESTINAL FISTULAE

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### SUMMARY

This work sets out to evaluate the merits and demerits of management of external gastrointestinal fistulas (EGF) with oral diets (OD) and early surgical closure (ESC).

It was a controlled randomised prospective study of 53 patients with EGF carried out during a ten –year period at the Jos University Teaching Hospital. Twenty five patients were assigned to OD against 28 patients who were assigned to ESC.

Hospital mortality rate for OD was 56% against 25% for ESC ( $p>0.05$ ). A significant difference in morbidity however was noted especially as intractable diarrhoea was observed in 60% of patients on OD as opposed to 10% in patients in the ESC group. Also significant differences were recorded for severe dehydration which in OD group was 56% against 7% in the ESC group. There was a significantly longer period of hospitalisation in the OD group, which was more than 30 days. There was no significant difference in weight gain at six weeks of treatment in the two groups. At six months of treatment, there was fistula closure rate of 63% in the OD group as against 72% in the ESC group which difference was

not statistically significant.

Both OD and ESC were equally effective in achieving fistula closure at 6 months of treatment but significant number of patients in the OD group suffered from troublesome diarrhoea and dehydration.

**KEYWORDS:** External gastrointestinal fistulae, oral diet, early surgical closure, mortality and morbidity.

### INTRODUCTION:

External gastrointestinal fistula (EGF) presents problems in management especially as regards fluid and electrolyte imbalance, intra-abdominal sepsis and fistula closure. The current approach to the problem of EGF includes the early use of total parenteral nutrition until the gut recovers its tone and motility [1]. Thereafter, elemental diets, [2] somatostatin or its synthetic analogues like octreotide [3] are employed to decrease fistula output and ensure spontaneous fistula closure. Surgery is employed for drainage of intra-abdominal abscesses and for closure of EGF when conservative methods fail or when distal obstruction exists in the gastrointestinal tract. In the absence of these pharmacological agents, the management of EGF without distal obstruction either with

blenderized diets alone or early surgical closure are indeed attractive alternatives.

With great labour, advocates of both policies have collected small series of patients with EGF in different retrospective studies to show that excellent curative results could be obtained with the particular form of treatment they had adopted [4,5].

This study is designed to prospectively compare early surgical closure (ESC) versus oral blenderized diets (OD) in the management EGF with no distal obstruction with a view to evaluating the merits and demerits of these management options.

## **MATERIALS AND METHOD**

A controlled, randomised and prospective study of 53 patients with EGF was carried out at the Jos University Teaching Hospital (JUTH), Jos, Nigeria. These cases accrued to the study between January 1986 and December 1995. Randomization of patients into two groups – those managed on oral blenderized diets (OD) and those managed with early surgical closure (ESC) – was carried out by the tossing of a coin. 25 patients were assigned to the OD group and were fed four hourly on Kwashpap 11 and adult blenderized diet that provided about 3000kcal per day [6]. This high protein, high carbohydrate and highly enriched diet was prepared at the Dietetic Department of Jos University Teaching Hospital. The indication for surgery in the ESC group – as in the OD group – was the presence of external gastrointestinal fistula without any distal obstruction.

Early surgical closure – surgery was performed within one week of admission under prophylactic antibiotic cover with gentamicin, ampicillin and metronidazole and

after adequate resuscitation.

The demographic and the clinical data of all these patients including the fistula output, weight changes, abdominal ultrasonographic findings and gastrointestinal contrast studies were collected by the authors including serial fluid and electrolyte results. The patient characteristics regarding the causes of the fistula, the sites and the output of the fistulae were also recorded. The patients were followed up for an average of 18 months. The results were subjected to statistical analysis by employing the Yates corrected  $X^2$  test. The differences in the variables studied were regarded as significant if  $p$  was less than 0.05.

## **RESULTS**

The main age of presentation for patients in the OD group was ( $28 \pm SD 2$ ) years versus ( $32 \pm SD 2$ ) years for those in the ESC group. Sex ratio M:F was 3:2 for OD versus 3:2:4 for ESC. The other patient characteristics are as listed in Table I. In the ESC group, 22 patients with small bowel and caecal fistulae under went simple closure, 26 others with small bowel fistulae under went resection and anastomosis, one patient with a large caecal fistula under went a right hemicolectomy and closure. Five synchronous inter-intestinal loop abscesses were drained in the ESC group, although, these patients initially had negative abdominal ultra-sonographic findings.

Hospital mortality at one month for OD was 56 versus 25 percent for ESC ( $p > 0.05$ , see Table II). Similarly, there was no significant difference in major complications like bronchopneumonia, electrolyte imbalance and wound infection between OD and ESC. Diarrhoea occurred in OD

**Table 1: Causes, site and output of EGF's JUTH: 1986-95**

Causes	Site	No (n=53)	Output	OD (n=25)	ES (n=28)
Vagotomy and Pyloroplasty	Duodenal	2	High	1	1
Intestinal resection	Jejunal	4			
	Ileal	5	High	5	4
Ileal substitution	Ileal	1	High	0	1
Adhesiolysis	Jejunal	2	High	1	1
Herniorrhaphy	Jejunal	1			
	Ileal	3	High	2	2
Closure for Typhoid perforation	Ileal	24	High (20)		
			Low (4)	10	14
Appendectomy	Caecal	7	Low (2)		
			High (5)	4	3
Hysterectomy	Sigmoid	4	Low	2	2

High output > 1 liter/day; Low output < 1/day.

**Table II: Mortality and morbidity characteristics of patients with EGF; JUTH: 1986-95**

	OD (n=25)	ESC (n=28)	Total (N=53)	P-value
Hospital mortality	14(56)	7(25)	21(40)	0.21
Bronchopneumonia	4(16)	2(7)	6(11)	0.50
Major electrolyte imbalance	10(40)	5(18)	15(28)	0.29
Wound infection	5(20)	8(28)	13(26)	0.49
Diarrhoea	15(60)	3(10)	18(34)	0.018
Dehydration	14(56)	2(7)	16(29)	0.011

in 60 versus 10 percent for ESC. This difference was significant. Similarly, severe dehydration occurred in 56 versus 7 percent respectively and this difference was also significant. Table III illustrates the hospital stay of patients with EGF in OD versus ESC. There was a significant difference in the hospital stay in the first 30 days when both groups were compared, except for those patients who stayed between (22-29) days. There were also significantly more

patients in OD than ESC who stayed longer than 30 days in hospital.

Table IV indicates the observed weight changes in both groups based on ideal weight charts for age and sex of patients. Patients were divided into three categories: Underweight, if weight on admission was 10 percent or less below ideal weight, normal if within plus or minus 10 percent of ideal weight and overweight if the weight was more than 10 percent of ideal weight.

**Table III: Hospital stay of patients with EGF**

Stay in Days	OD (n=25)	ESC (n=28)	Total (n=53)	P-Value
7-14	8	0	8	0.014
15-21	13	0	13	0.0017
22-29	3	1	4	0.41
30-37	1	11	12	0.014
38-45	0	7	7	0.022
>45	0	9	9	90.010

**Table IV: The observed weight changes of patients with EGF; JUTH: 1986-95**

Category	OD (n=25)		ESC (n=28)		P-Value
	Admission	After 6 wks	Admission	After 6 wks	
Under Wt.	15	Under - 6	21	Under - 2	0.087
		Normal - 7		Normal - 4	0.53
		Over - 2		Over - 5	0.51
Normal Wt.	6	Under - 4	6	Under - 2	0.073
		Normal - 1		Normal - 2	0.60
		Over - 1		Over - 2	0.60
Over Wt.	2	Under - 0	1	Under - 0	1.0
		Normal - 1		Normal - 1	
		Over - 0		Over - 0	

\* Two patients with duodenal fistulas; 1 in each treatment group died within six weeks of admission.

**Table V: The number of patients with EGF expected and those actually studied; JUTH: 1986-96**

Follow up		Months					
		3	6	9	12	15	18
Patients expected	OD (n=10)						
Patients studied		10	10	10	4	3	3
Patients expected	ESC (n=2)						
Patients studied		21	18	5	1	0	0

2 patients, 1 in each treatment group died within six weeks.

The recorded number of patients in each category on admission and six weeks following management with OD and ESC are also shown. No significant differences in weight changes were observed in patients six weeks following management with OD compared to ESC.

Table V indicates the 18 month follow-up of the 23 patients in OD versus 25 in ESC; excluded from the hospital mortality were 2 patients, one in each group with duodenal fistula who died within 6 weeks of significant malnutrition (loss of 20 percent or more of total body mass within 6 months). At one year, most of the patients were lost to follow-up, with sixty percent in OD versus 99 percent in ESC. Similarly figures at 18 months were 70 versus 100 percent respectively.

## Discussion

To elucidate some of the controversial aspects of the management of EGFs without distal obstruction, we tried to perform the present study to evaluate the merits and demerits of OD and ESC in a setting where no alternative management option exists. Despite the abundance of literature comparing these two management modalities from Nigeria<sup>(5,7)</sup>, there are no prospective studies on the subject. Studies of this type are badly needed so that variables in patient selection as well as in diagnostic and therapeutic modalities can be kept to a minimum.

In this study, comparative figures for hospital mortality for patients managed with both forms of treatment indicated that management with OD was not associated with higher mortality rate. An overall mortality of 40 percent was record for both forms of treatment. Mortality could be more

related to the site of the fistula in the gastrointestinal tract with duodenal fistulas being uniformly fatal irrespective of the treatment method employed. Caecal fistulae were usually associated with the least mortality. Our experience suggest that the decision to operate on cases of EGF in the duodenum should be guarded because of the high incidence of recurrence and development of synchronous multiple intra-abdominal abscesses. The nutritional status of patients was also an additional determinant of mortality in this study as evidenced by the four patients who died within six weeks in hospital as a result of severe nutritional depletion. Edmonds et al [8] had similar observations about the relationship or mortality in EGFs to site and nutritional status of patients in their study. Similarly, complications arising as a result of treatment with OD and ESC of EGFs were compared. Bronchopneumonia was commoner in the OD group due to the prolonged period of Recumbency that is usually a feature of ill-patients with EGF but the difference was not significant. Diarrhoea was significantly commoner in patients on OD due to the hyperosmolar nature of such diets, poor intolerance to some of the components, and inadvertent introduction of sepsis into the finished products [9]. It might be expected that such diarrhoea with increase in fistula turnover will result in the major electrolyte imbalance in patients that were fed on OD. However no significant difference in major electrolyte imbalance was recorded when OD and ESC were compared. Blenderized diets with solute concentrations of 25 percent weight by volume frequently result in hypertonic dehydration and osmotic diuresis in patients with EGFs, especially in the absence of

additional water intake [2].

This has not been corroborated in this study since there was a significant difference in number of patients with severe dehydration in the OD group. Wound infection, however, occurred with greater frequency in ESC group, despite the preparative use of parenteral antibiotics, although, such a difference was not significant. Overall patients in the OD group were relatively more prone to complications when compared with those who underwent ESC as corroborated by the significantly longer hospital stay. The weight changes observed in patients with EGF deserves special mention because it serves not only as objective index of effectivity of both treatment modalities but also as a prognostic index of survival [8]. Comparison of body weight changes in both treatment groups at six weeks following the institution of management indicated that there were no significant differences in the weight of patients. It should be expected that patients on OD, who develop intra-abdominal abscesses with paralytic ileus would be hampered from absorbing such diets with attendant negative weight changes. Our results have not supported such a proposition. Our experience in this study suggested that a clinical diagnosis of synchronous intra-abdominal abscesses in patients with EGFs cannot be made with absolute accuracy as evidenced by the 5 cases of intra-abdominal abscesses that were drained in the ESC group in patients whose abdominal ultrasound findings were negative on initial evaluation

In the final evaluation of management of EGFs by OD versus ESC, the curative indices of both forms of treatment must be taken into consideration. Early surgical

closure was employed in achieving closure in 53 versus 48 percent in the OD group at six months of follow-up. The difference was not significant. A majority of the patients were lost to follow-up at twelve months, which makes it impossible to provide definite curative indices of OD in patients with EFG in the long term. In trying to make a final appraisal of the merits and demerits of the two forms of treatment compared in this study therefore, we find that ESC can significantly decrease the incidence of diarrhoea and severe dehydration that attend the use of OD. A significant decreased hospital stay is to be expected in patients managed with ESC, although, both methods of treatment were equally effective in achieving fistula closure at six months. There is no doubt that enteral nutrition can be provided safely and effectively for prolonged periods. However, it is increasingly recognized that it often fails to achieve targetted calorie requirements often as a result of poor tolerance manifested by bloating diarrhoea [9].

The best approach to the treatment of external gastrointestinal fistula continues to be of concern to surgeons. While Ajao et al [14] recommended frequent feeding of the patients with highly enriched diets orally – a view shared by Onen et al [10] in their experience in managing enterocutaneous fistulae following typhoid perforation, Wang et al [11] working in China recommend a combination of early nutritional intervention and subsequent surgical management. The place of control of sepsis, adequate nutritional support and regular monitoring of vital organ functions in the management of enterocutaneous fistulae is pivotal [12].

In prognosticating the outcome of management of patients with external

gastrointestinal fistula, it has been reported that high levels of serum transferrin was predictive of spontaneous closure while high serum levels of retinol-binding protein and thyroxin-binding pre-albumin are predictors of mortality. [13, 14].

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