

Full Length Research Paper

The profile and clinical spectrum of indications, challenges and complications for gastrostomy or jejunostomy in a developing country: A 2 center study

Nwafor I. A.^{1*}, Akanni B. A.², Obi C. C.² and Nsude I. O.¹

¹University of Nigeria Teaching Hospital, Ituku-Ozalla, Enugu, Nigeria.

²Alex Ekwueme Federal University Teaching Hospital, Abakiliki, Ebonyi, Nigeria.

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Inadequate or absence of oral feeding including gastric decompression arising from multiple causes constitutes the indications for gastrostomy/jejunostomy. The clinical spectrum includes but not limited to improving nutritional status and reducing weight loss and avoiding bronchopulmonary complications. To highlight the profile and clinical spectrum of indications and challenges for gastrostomy or jejunostomy in a low-income-setting. A retrospective study spanning 12 years (2010 - 2021) evaluating the indications for gastrostomy in two tertiary hospitals was performed. The data were obtained from the surgical wards and operative registers including the hospitals' medical record department data base. The data obtained were demography, types of gastrostomy, profile and clinical spectrum of indications for gastrostomy or jejunostomy. A total 119 patients with male to female ratio of 8:5 had the procedure. The types done were 86(86.6%) open, 16(13.4%) closed gastrostomy and 17(14.3%) open jejunostomy. Age ranges of patients affected (open gastrostomy or jejunostomy) were between 0-10 yrs(19.1%) and 81-90 yrs(2.4%) with a mean of 53+0.54 yrs. That for close gastrostomy, the age ranges of (0-10yrs) and (81-90yrs) were 0% and 2.5% respectively, with a mean of 66 + 0.35 yrs were noted. The clinical profile and spectrum of indications were non-functional and functional gastrointestinal tract. Gastrostomy or jejunostomy whether closed or open is essential in the management of patients with impaired spontaneous oral feeding from a variety of causes. Surgical (open) gastrostomy or jejunostomy appeared to be the major type in our sub-region, mainly because of the types of the pathology.

Key words: Gastrostomy, enteral, parenteral, feeding, malnutrition, complications, jejunostomy.

INTRODUCTION

Adequate nutrition implies food availability (absence of starvation), its adequate intake and proper utilization by the tissues for growth and energy. Malnutrition can arise when any of the aforementioned factors are affected either singly or in multiples. Again food intake by way of enteral nutrition is ensured by swallowing (oral,

pharyngeal and oesophageal phases) (Badoe et al., 2000). Diseases affecting these pathway(s) can lead to dysphagia or aphagia and ultimately to malnutrition if there is no intervention by parenteral route. Excessive tissue utilization and dumping syndrome (Emido et al., 2020) including cardiac cachexia (Wolfman and Stefan,

*Corresponding author. E-mail: Igbochinanya2@yahoo.com or ikechukwu.nwafor@unn.edu.ng; Tel: +2348037784860.

2010) are other ways malnutrition can occur despite food availability and its intake enterally.

The primary indication for enteral and parenteral feeding is the provision of nutritional support to meet metabolic requirements for patients with inadequate oral intake. Enteral feeding is usually the preferred method over parenteral feeding in patients with a functional gastrointestinal tract (GIT) due to the associated risks of the intravenous route, higher cost and inability of parenteral nutrition to provide enteral stimulation and promote the gut defense barrier (Alverdy et al., 1985; Deitch et al., 1990). Patients in developing countries with dysphagia grade 2 according to Mellow and Pinka (Ahmed et al., 2020; Levy et al., 2020) from chronic corrosive oesophageal stricture among other causes, who present with significant weight loss are usually offered open or laparoscopic gastrostomy or jejunostomy to enable enteral feeding and weight gain before oesophageal reconstruction with colonic flap is carried out to establish normal GIT (Eze et al., 2014; Ezemba et al., 2014). The reasons for open gastrostomy in such patients are two folds, that is, high cost of parenteral nutrition and that enteric feeding can decrease the risk of bacterial translocation and corresponding bacteremia (Grant, 1988).

In other related conditions, the GIT may be functional, yet patients may not be able to achieve oral intake. Since gastric or jejunal feeding is the most common type of enteral feeding, such patients are provided with gastrostomy via endoscopic route (PEG or PEJ) (De Oliveira, 2016). A variety of indications for such procedures avail and include but not limited to cerebrovascular accident, amyotrophic lateral sclerosis, cerebral palsy, head injury, prolonged coma and head-neck cancer (Melchail et al., 2001; Park et al., 1992).

The primary goal of enteral nutrition either by gastrostomy or jejunostomy whether open or close is not only to improve the patient's survival and nutritional status, but also to improve their quality of life which is not necessarily correlated with nutritional improvement (Baeten and Hoeffnagels, 1992). Also the long-term survival rate of some patients is low due to their underlying disease and this needs to be considered when undertaking the procedure (Blomber et al., 2012).

MATERIALS AND METHODS

This is a retrospective study spanning 12 years (2010-2021) evaluating the indications for gastrostomy and jejunostomy in two tertiary hospitals in South East Nigeria. The study was performed using the data which were obtained from the surgical ward and operation registers including the hospitals' medical record department database. The data obtained were patients' demography, types of gastrostomy, profile and clinical spectrum of indications for gastrostomy or jejunostomy. Others were challenges and outcome. Inclusion criteria were all patients offered either open/laparoscopic or closed/endoscopic gastrostomy or jejunostomy (PEG/PEJ). Those offered nasogastric tubes (NGT) alone for enteral feeding were excluded from the study. The data were

analyzed using SPSS version 20 (Chicago).

RESULTS

Table 1 displays the age ranges of patients with open gastrostomy or jejunostomy. The age range of 41-50 was the highest while the least was the 81-90. Table 2 displays the age range of patients with close gastrostomy. Here the age range of 71-80 was the highest. Table 3 shows the distribution of indications for open gastrostomy. Here corrosive oesophageal stricture was the highest followed by oesophageal carcinoma. Table 4 shows the distribution of indications for close gastrostomy. Cerebrovascular accident was the highest while the least was encephalitis. Table 5 shows the distribution of indications for open jejunostomy. Chronic oesophageal stricture with severe stenosis of the pylorus was the highest followed by GEJ tumours with greater involvement of the stomach. There was no percutaneous endoscopic jejunostomy (PEJ) in the series reviewed.

Table 6 shows the distribution of complications of gastrostomy (both closed and open) and management protocol. For open gastrostomy, skin excoriation was the highest followed by tube blockage. Complications in general are more with open than closed, perhaps in relation to adaptation of Foley's catheter for gastrostomy tube.

Figure 1a to c shows the Foley's catheter, gastrostomy and PEG tubes. Foley's catheter: sizes 28, 30 or 32 French Gauge, constituted the most readily available and cheapest material in use in developing countries like ours for gastrostomy.

Challenges

1. High cost of gastrostomy or PEG tube
2. Non-availability (not readily available)
3. Deflation of balloon (urethral catheter) → frequent dislodgment
4. Lack of equipment
5. No technical know-how (pediatric anesthetists and endoscopic/laparoscopic experts).

DISCUSSION

Gastrostomy or jejunostomy feeding is a form of enteral feeding and decompression. This is indicated in a variety of pathological conditions with the purpose of maintaining nutritional status where the oral route is inadequate, unsafe or inaccessible (Sue, 2011). In our practice, the indications are classified as central and peripheral. The central is cerebrovascular related. The local comprises pathologies that directly affect oral, pharyngeal and oesophageal phases of deglutition resulting in dysphagia.

In oesophageal causes of dysphagia, chronic

Table 1. Patients with open gastrostomy or jejunostomy.

S/N	Age range (years)	Number	Percentage
1	0-10	16	17.2
2	11-20	5	5.4
3	21-30	9	9.7
4	31-40	9	9.7
5	41-50	17	18.3
6	51-60	13	13.9
7	61-70	12	12.9
8	71-80	10	10.8
9	81-90	2	2.2
Total		93	100

Source: UNTH, Enugu; AEFUTHA, Ebonyi

Table 2. Patients with percutaneous endoscopic gastrostomy (PEG).

S/N	Age range (years)	Number	Percentage
1	0-10	0	0
2	11-20	1	3.9
3	21-30	1	3.9
4	31-40	1	3.9
5	41-50	2	7.7
6	51-60	5	19.2
7	61-70	5	19.2
8	71-80	9	34.6
9	81-90	2	7.7
Total		26	100

Source: UNTH, Enugu; AEFUTHA, Ebonyi

Table 3. Indications for open gastrostomy.

S/N	Indications for gastrostomy	Number	Percentage
1	Tracheo-oesophageal fistula (TOF)	2	2.3
2	Corrosive oesophageal stricture	52	60.5
3	Oesophageal carcinoma	15	17.4
4	Parkinson disease	1	1.2
5	CVA with bulbar involvement	1	1.2
6	Pseudoachalasia	3	3.5
7	Achalasia	3	3.5
8	Laryngeal ca	4	4.7
9	Nasopharyngeal carcinoma	1	1.2
10	Tonsillar carcinoma	1	1.2
11	Mandibular carcinoma	1	1.2
12	Oesophageal perforation	2	2.3
Total		86	100

Source: UNTH, Enugu; AEFUTHA, Ebonyi

oesophageal stricture features prominently. According to Mello and Pinka's grading of dysphagia

(WWW.MacheKnife3.org/Scoring system/dysphagia.html; Sellinger et al., 2008) in this setting, the patients in grade,

Table 4. Indications for close gastrostomy (PEG).

S/N	Indication	Number	Percentage
1	CVA	6	37.5
2	Brain stem infarct	2	12.5
3	Laryngeal carcinoma	3	18.7
4	Oropharyngeal carcinoma	4	25.0
5	Encephalitis	1	6.3
Total		16	100

Source: UNTH, Enugu; AEFUTHA, Ebonyi

Table 5. Indications for open jejunostomy.

S/N	Indications	Number	Percentage
1	Gastroesophageal junction(GEJ) tumours	5	29.4
2	Chronic eosophageal stricture with severe stenosis of the pylorus	10	59.9
3	Pseudoachalasia	2	11.7
Total		17	100

Source: UNTH, Enugu; AEFUTHA, Ebonyi

Table 6. Complications and Management procedures.

Complications	Number	PEG/PEJ	OG/OJ	Percentage	Management
Failure of function	2	0	2	5.4	Loosening the external anchorage
Necrotising fasciitis	3	1	2	8.1	Redo, wound dressing and antibiotics
Prolapse±pyloric obstructions	4	0	4	10.8	Pulling back and re-anchoring
Skin excoriation	15	5	10	40.5	Application of zinc oxide cream
Blockage	8	5	3	22.0	Flushing with water or change of catheter
Dislodgment	5	3	2	13.5	Replacement
Total	37	14 (37.8%)	23 (62.2%)	100	

Source: UNTH, Enugu; AEFUTHA, Ebonyi

III and IV are invariably offered gastrostomy or jejunostomy by open or laparoscopic method. Thus, the other indications for open or laparoscopic gastrostomy or jejunostomy including closed gastrostomy are as highlighted in Tables 3 to 5. In our institution, the equipment and the technical know-how for closed gastrostomy were acquired just 5 years ago. Before then those with indications for closed gastrostomy were offered open gastrostomy or jejunostomy. Prior to the commencement of PEG, some patients scheduled for open gastrostomy, were found intraoperatively to be contraindicated for that (Table 5). Such patients were offered open jejunostomy. Skills to do percutaneous endoscopic jejunostomy are still evolving and have not been perfected before this review. However, the institution of closed technique has streamlined patients' treatment in line with international standard.

As highlighted in the results, all age groups except for

0-10 in the closed GT types were affected (Tables 1 and 2). In a similar study done in South Africa over a 5-year period, in children of age group of 0-18 years, 142 patients were involved (Norman et al., 2011). In this study, dysphagia, aspiration, need for nutritional support and oesophageal stricture/atresia were the major indications. In the present study, corrosive stricture and oesophageal carcinoma were the major indications for the age groups, from 0-16 to 81-90 years.

In a resource limited country like ours, gastrostomy and PEG-tubes are not readily available and when available, the cost is prohibitive. To this end, Foley's catheter, sizes 28 and 30 have been adapted for use in open gastrostomy or jejunostomy procedures with good results comparable to the standard gastrostomy tube (Figure 1a and b). The benefits of the Foley's catheter in enteral nutritional support are as indicated in Table 3 especially in chronic oesophageal stricture[8,9] and oesophageal

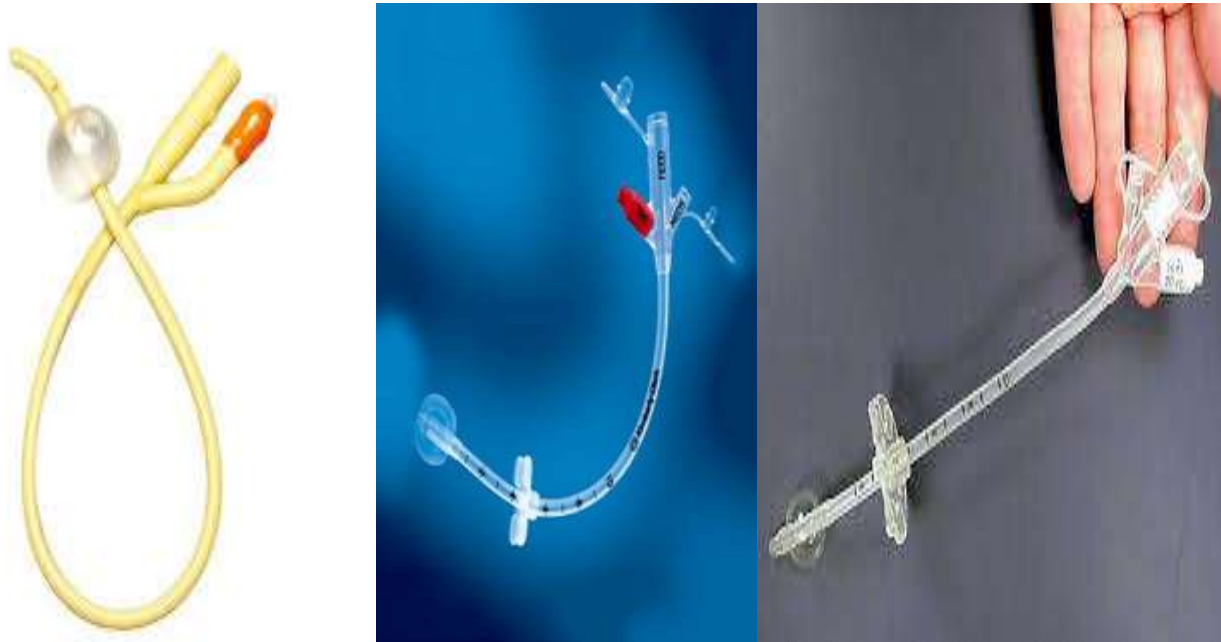


Figure 1. (a) Foley's catheter, (b) Gastrostomy tube, (c) Peg tube.
Source: Google image (endoscopist album)

carcinoma due to the absence of technical-know how of stent placement in our setting. Again, in open gastrostomy, jejunostomy may be indicated instead if during the procedure, it is found that there is pyloric obstruction. Other indications for jejunostomy are as highlighted in Table 5. The alternative is do gastrojejunostomy with gastrostomy in the same procedure. Commonly, Stamm rather than Janeway was the norm in our practice (Tapia et al., 1999).

The emerging trend in gastrostomy in the present setting is PEG. The indications and the age ranges of patients treated in the envisaged period are as highlighted in Tables 2 and 4. In this study group, CVA was the commonest indication followed by oropharyngeal carcinoma. In other studies (Badoe et al., 2000; Emido et al., 2020; WWW.MacheKnife3.org/Scoringssystem/dysphagia.html), many other indications were highlighted. The trend here is that PEG constitutes less morbidity and mortality than surgical gastrostomy. The implication is to use laparoscopic GT in cases where PEG is contraindicated like chronic oesophageal stricture or tracheoesophageal fistula or atresia. Laparoscopic GT is emerging in our center and in time to come, it will replace open G-T.

The complications of G-T, whether open or closed, encountered in the present study were listed in Table 6. Among them, skin excoriation was the highest complication followed by blockage. Other complications including the management procedures were stated. The types of food ranged from liquid to semisolid diet. The liquid diet included tea, fruit juices while semisolid diet

included pap, custard and blenderized yam, rice, potatoes, etc. The process of allowing some patients or family care givers to do the feeding at home frequently led to blockage because enough water was not applied. Those on temporary feeding GT or jejunostomy were fed mainly with tea and pap. In similar studies, complications noted were classified into major (aspiration pneumonia, bleeding, bowel perforation, buried bumper syndrome, necrotising fasciitis) and minor (wound infection, peritonitis, tube blockage, gastric outlet obstruction and dislodgement) (Sealock and Munot, 2018). In the course of review of the records, there was no documented data of any mortality arising as a result of institution of open gastrostomy or jejunostomy and PEG, other than the primary pathology that necessitated the gastrostomy or jejunostomy.

Conclusion

In our institution, open gastrostomy constituted the majority (76.4%) for two reasons: (1) the commonest indications are chronic oesophageal stricture of which PEG is contraindicated and (2) laparoscopic gastrostomy is emerging. The emerging trend of PEG and laparoscopic gastrostomy will conform our institution to international standard. However, the adaptation of appropriate sizes of Foley's catheter as gastrostomy tube will continue to benefit some indigent patients especially those with nonfunctional gastrointestinal tract like grade 4 Mellow and Pinka dysphagia from chronic oesophageal stricture,

advanced oesophageal cancer and oesophageal atresia.

ABBREVIATIONS

UNTHE - University of Nigeria Teaching Hospital, Ituku-Ozalla, Enugu. **AEFUTHA** - Alex Ekwueme Federal University Teaching Hospital Abakiliki

CONFLICT OF INTERESTS

The authors have not declared any conflict of interests.

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