

## Pattern of Gastrointestinal Perforation (GIP) In a South-South Nigerian Tertiary Hospital

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### Abstract

**Background:** Gastrointestinal perforation (GIP) is a common surgical emergency worldwide. The common aetiological factors are related to geographical and racial disposition of the patients, no age is exempt. Presentation is often late and resources scarce in developing countries resulting in higher morbidity and mortality. This study highlights the causes, presentation and management of Gastrointestinal perforation in a tertiary hospital in southern Nigeria.

**Material and Methods:** All patients who had GIP between 1<sup>st</sup> JAN 2014--30<sup>TH</sup> APRIL 2015 in Delta State University Teaching Hospital, Oghara Delta State South-South Nigeria were prospectively studied via a proforma after due consent from them. Data was analyzed using SPSS version 11.

**Results:** 104 patients had GIP, 92 of the patients gave consent (88.4%). Peak age group was the 3<sup>rd</sup> decade, mean age 35.4± 8.08, age range 2-87years and male to female ratio 5:1. Fever 91.3%, abdominal pain 97.8%, abdominal distension 94.5% and guarding 91.3% were the common presenting features. Generalized peritonitis was seen in 95.6%. Commonest cause of GIP were perforated appendix 31.5%, perforated peptic ulcer disease 22.8%, traumatic perforation 17.4% and typhoid ileal perforation 13%. About 1 in 4 perforations were at the ileum. Almost 4 out of every 9 patients (45.8%) presented late, more than 5 days from symptom onset. Overall complication rate was 36.9%, Surgical site infection was the commonest 21.7%. Overall mortality was 17.4%.

**Conclusion:** Perforated appendix is the commonest cause of GIP In our centre. Mortality in GIP is high and is related to late presentation to our tertiary centre. There is need for early presentation and referral of patients with GIP in the region and an all inclusive of health insurance scheme may improve outcome.

**Key Words:** pattern, gastrointestinal perforation, south-south, perforated appendix.

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### I. Introduction

Gastrointestinal perforation (GIP) is a common cause of acute abdomen encountered by surgeons worldwide<sup>1,2,3</sup>. The aetiological spectrum differs and no race, age group or gender is exempt.

Proximal GIPs (stomach, small intestine) are more common in Africa and Asia<sup>4,5</sup> while distal GIP (colon and rectum) are commoner in western countries<sup>6,7</sup>.

In sub-Saharan African countries and many other resource poor setting where ignorance and poverty is rife, a good proportion of patients with GIP present late with associated high morbidity and mortality<sup>8</sup>.

This poses a great challenge to contemporary practising surgeons in these low resource countries vis-a-vis control of infection and sepsis, restoration of haemo/homeostasis and finances to procure surgical consumables in the setting of severe peritonitis.

The objective was to highlight the causes, presentation and management of GIP as seen in Delta State University Teaching Hospital Oghara, Delta State South-South Nigeria in a 16 months prospective study.

### II. Materials and Method

This prospective observational study was carried out in general surgery department Delta State University teaching hospital

**Study design:** prospective observational study

**Subjects and selection methods:** The study population included all patients who presented with GIP between 1<sup>st</sup> JAN 2014 to 30<sup>TH</sup> APRIL 2015 in Delta State University Teaching Hospital Oghara, Delta State.

Patients who died in the emergency room, who did not consent to the study, absconded from hospital or refused surgery, were excluded from the study.

**Procedure methodology**

Patients with GIP were prospectively studied via a proforma after written informed consent was obtained. Relevant history and clinical findings were documented. Patients were optimised; using intravenous fluids to correct fluids and electrolyte derangement, Nasogastric tube were inserted to decompress the stomach, Foleys Urethral catheter to monitor urine output and broad spectrum parenteral empirical antibiotics (ceftriaxone and metronidazole) were instituted pre-operative and post-operative in all the patients.

All patients had exploratory laparotomy and the source of perforation identified and closed. Copious peritoneal lavage was done using normal saline. Cardiopulmonary unstable patients were admitted into the intensive care unit.

### Statistical analysis

Data obtained were analyzed using SPSS version 11.

### III. Results

A total of 104 patients were seen during the study period, 92 of them gave consented (88.4%). Peak age group was the 3<sup>rd</sup> decade. Mean age  $35.4 \pm 8.08$ . Age range was 2-87years. Male to Female ratio was 5:1.

Most patients presented with multiple cardinal features. Common presenting features were fever 91.3%, abdominal pain 97.8%, abdominal distension 94.5% and guarding 91.3%. Generalized peritonitis was present in 95.6%. Seven patients had associated preoperative comorbidities (4 had hypertension, 2 diabetes mellitus and 1 had pulmonary tuberculosis). No patient tested positive to human retrovirus.

Late presentation was defined as > 72hours from symptom onset. Almost 3 out of every 4 patients (72.9%) presented late. The major reason for delayed presentation was financial constraint (47%), others reasons given by the patients were ignorance (30%) and delayed referral from peripheral hospitals (27%).

The ileum was the commonest site of perforation (28.30%), others were appendix (27.4%), duodenum (17%) jejunum (12.3%) stomach (8.5%) and the colon was the least (7%).Ratio of proximal (stomach to ileum) to distal (appendix and colon ) was 2:1. About 1 in 5 had multiple perforations.

Commonest cause of GIP were perforated appendix 29 (31.5%), perforated peptic ulcer disease 21(22.8%), traumatic perforation 16 (17.4%) and typhoid perforation 12 (13%). Iatrogenic perforation 7 accounted for (7.6%) and malignant perforation (three colon and one stomach) was 4(4.4%).A patient had perforation due to tuberculosis while in two others the cause could not be identified.

Among the patients that had traumatic GIP, gunshot injuries accounted for more than half (56.3%), other causes were stab injuries (25%) and blunt abdominal injuries (18.7%)

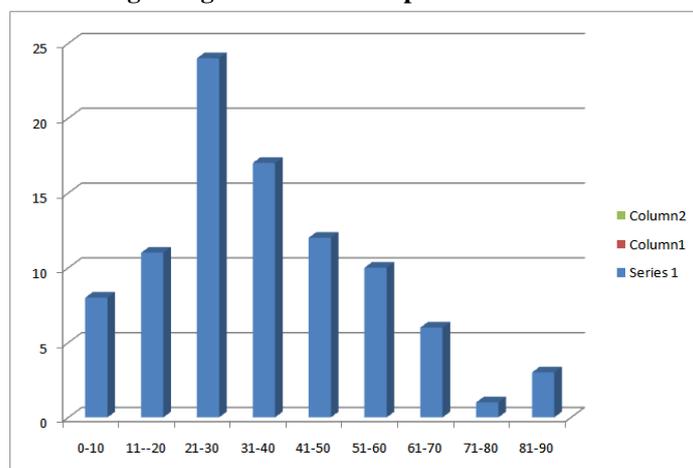
Wedge resection and simple repair was the most common procedure done (27%) for small bowel perforation. Appendectomy (25.4%) was done for perforated appendix, omental patch (Graham) repair (24.5%) was done for benign gastric/duodenal perforations, appropriate resection for gastric and small bowel disease and end to end/side anastomosis constructed in 9%, right hemicolectomy (5.3%), exteriorizing colostomy (8%) was done for colonic perforation and an ileostomy done in 1%.

Overall complication rate was 36.9% and the group who presented late (>72hours) accounted for almost 3/4 of this. Surgical site infection was the commonest (21.7%) complication and was more in the typhoid group (8%).

Overall mortality was 17.4% with those presenting late accounting for 13.1%. Overwhelming sepsis and septic shock were identified as the major cause of death.

### Preoperative Data

**Fig 1. Age distribution of patients with GIP**



Peak age in 3<sup>rd</sup> decade, mean age 35.4± 8.0, age range 2-87

Table 1: Common Clinical Presentations

CLINICAL FEATURES	FREQUENCY	PERCENTAGES
fever	84	91.3
Abdominal pain	90	97.8
Abdominal distension	87	94.5
vomiting	75	81.5
constipation	61	66.3
guarding	84	91.3
peritonitis	88	95.6

Table 2: Symptom onset to presentation interval

Time interval (Hours)	Frequency	Percentage
<12	4	4.2
12-24	8	8.3
25-72	13	14.6
73-120	25	27.1
>120	42	45.8
	92	100

Almost 1/2 of the patients presented >120hrs from symptom onset.

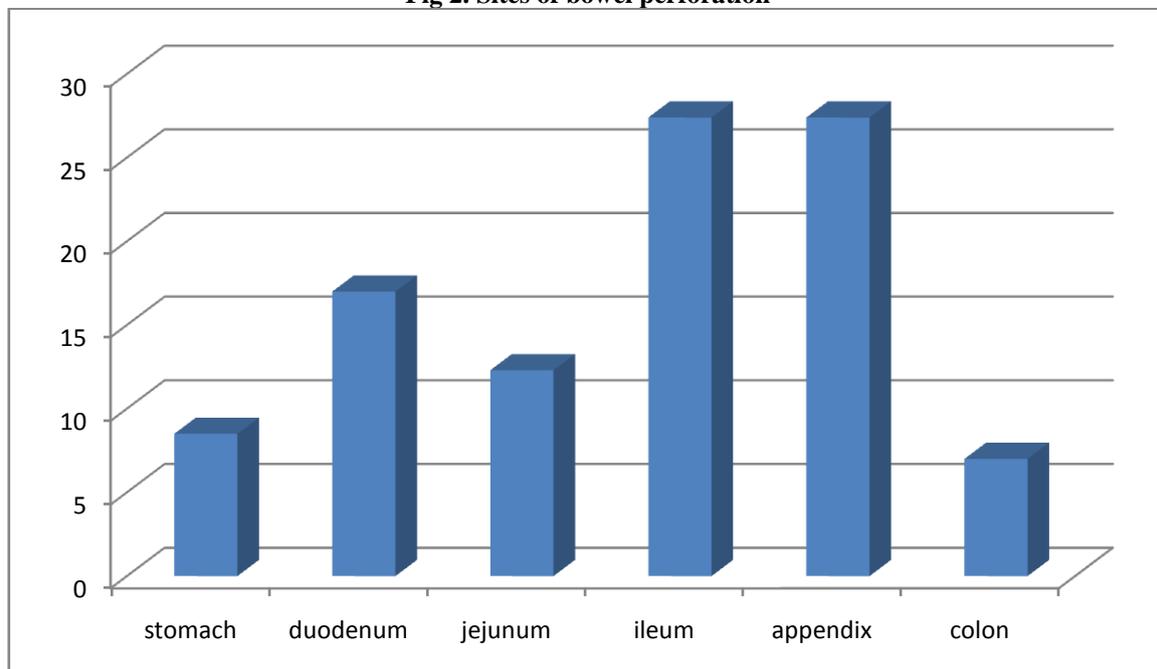
Postoperative Data

Table 3 Causes of Gastrointestinal Perforations

AETIOLOGY	FREQUENCY	PERCENTAGE
Perforated appendix	29	31.5
Perforated PUD	21	22.8
Traumatic perforation	16	17.4
Typhoid perforation	12	13
Iatrogenic perforation	7	7.6
Malignant perforation	4	4.4
Iatrogenic	3	3.3
Total	92	100

Almost 1 in 3 patients had perforated appendix

Fig 2. Sites of bowel perforation



Upper gastrointestinal perforation accounted for 66.1% and lower GIP was 33.9%.

Table 4 Complication/mortality

COMPLICATIONS	FREQUENCY	PERCENTAGE
Superficial SSI	20	21.7
Wound dehiscence	7	7.6
Enterocutaneous fistula	2	2.2

<b>Intraabdominal abscess</b>	<b>3</b>	<b>3.3</b>
<b>Anastomotic leak</b>	<b>2</b>	<b>2.2</b>
<b>Overall Mortality</b>	<b>16</b>	<b>17.4</b>

#### **IV. Discussion**

Gastrointestinal perforation is one of the most common causes of peritonitis.<sup>9</sup> It is a disease of the young as shown in this study were the peak age group was in the third decade (21-30) and mean age 35.4years. This is similar to other studies in tropical countries<sup>10,11</sup> and in sharp contrast to that obtained in western countries where the disease is commoner in older age groups.<sup>12</sup>

The disease is significantly more common in males as observed in this study were male to female ratio was 5:1 similar trends were noted in other studies.<sup>11,13</sup>

Perforations involving the proximal bowel was predominant in this study with a ratio of proximal to distal perforation of 2:1. This is comparable to trends were seen in studies done in developing countries.<sup>5,14</sup> This sharply contrasts to that seen in developed countries where perforations are commoner in the distal part of the gastrointestinal tract.<sup>7,15</sup>

Abdominal pain was the commonest presenting symptom of patients in this study as is generally observed by other workers,<sup>5,14,16</sup> other important features noted were abdominal distension, fever and guarding.

Almost three out of four patients (72.9%) presented late (greater than 72 hrs from onset of symptoms) and poverty was identified as the major reason. This is a significant factor in Nigeria with a population over 160 million and about 61.2% living under one dollar per day<sup>17</sup> with very few citizens under health insurance coverage, payment of hospital bills by majority is "out of pocket".

Perforated appendix (31.5%) was the commonest cause of GIP in our study. It is also a significant aetiology in other reports.<sup>11,13,14</sup> Again poverty, ignorance and delayed presentation are important factors culminating in these patients presenting with complicated disease as they initially self-medicate or visit traditional healers before seeking help in hospitals. These patients had appendectomy and copious peritoneal lavage except for two who had limited right hemicolectomy because of an unhealthy cecum.

Perforation from complicated peptic ulcer disease was a significant cause of GIP in the study (22.8%). The ratio of gastric to duodenal perforation was 1:2. This being different from studies done in India<sup>11</sup> were ratio was 7:1 while United Kingdom<sup>18</sup> and United States<sup>19</sup> had ratio of 4:1. They had simple repair with pedicled omental patch.

Malignancy is commonly found in perforated gastric ulcer, an occurrence which is rare in duodenal perforation<sup>20</sup>. In our study, one out of eight (12.5%) of the gastric perforation were malignant while no malignancy was seen in the duodenum.

Traumatic GIP was mostly due to gunshot injuries (56.3%) following armed robbery, communal clashes and civil unrest. This is common in south-south Nigeria where illegal oil exploration and bunkering are rife with high level of youth unemployment and insurgency. Appropriate surgery was for these patients depending on site and extent of injury and degree of peritoneal contamination.

Fewer cases of typhoid enteric perforation (13%) were observed in contrast to what was seen in other parts of Nigeria where it constitutes a dominant cause of GIP.<sup>13,22</sup> This may be attributed to more availability of pipe born water, better hygiene and proper disposal of faecal materials since transmission of salmonella is mostly faeco-oral. Primary repair was the most common procedure done for typhoid GIP and this have been shown to be safe and effective treatment.<sup>23</sup>

Malignant colorectal perforations are a rare cause of perforation peritonitis in developing countries.<sup>6,15</sup> It accounted for only 3.3% in this study. This is a sharp contrast to that seen in developed countries where malignancy is a major cause accounting for 15-20% of GIP in some reports.<sup>24,25</sup> It have a high morbidity and mortality and its treatment options are based on the surgeons experience, patients general condition and degree of peritonitis.<sup>6</sup> Staged procedures give the best outcome.

Higher complication rates were observed in patients who presented late (28.2%) compared to (8.7%) seen in early presenters, similar observation was noted in other studies.<sup>26,27</sup>

The overall mortality due to perforation peritonitis ranges from 6-27%.<sup>28</sup> Mortality rate in our study was 17.4%, though within reported limits was still high. Patients who presented late had a higher mortality (13.1%) compared to mortality of 4.3% in patient who presented early but was not found to be statistically significant (p=0.88). Several works reported late presentation as a predictor of mortality.<sup>9,17,26</sup>

There was need for relook laparotomy and peritoneal washout in 6.5% who had intraabdominal collection and anastomotic dehiscence and this to control contamination and limit septicaemia. This is an important way of managing GIP<sup>29</sup>.

## V. Conclusion

Perforated appendix is the commonest cause of GIP In our centre. Mortality in GIP is high and is related to late presentation to our tertiary centre. There is need for early presentation and referral of patients with GIP in the region and also the expansion of the Nigerian health insurance scheme may improve outcome.

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