

Etiopathology of Gastric Outlet Obstruction: A Study in a Tertiary Care Hospital of Bangladesh

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Abstract

Background: Gastric outlet obstruction denotes complete or partial obstruction of the distal stomach, pylorus, or proximal duodenum. This can happen as a result of an obstructing lesion, external compression, or obstruction caused by acute edema, chronic scarring and fibrosis, or a combination of the two. The most common causes of gastric outlet obstruction are gastric cancer and pyloric stenosis secondary to peptic ulceration.

Objective: This study aimed to determine the etiopathology of gastric outlet obstruction in patients who presented with its clinical symptoms.

Methods: Between September 2012 to February 2013, this prospective observational study was conducted in the Surgery Department of Rangpur Medical College Hospital, Rangpur, Bangladesh. In total 50 patients presenting with the features of gastric outlet obstruction were included in this study as the study subjects. A convenient purposive sampling technique was used in sample selection. Registration schedules, editing computerization, preparing dummy tables, analyzing and matching data were all part of the data processing work. Results were calculated by standard statistical formulae.

Results: In this study, the mean $\pm$ SD age of the participants was 46 ± 13.71 years. Histopathology reports of all the 22 cases of antral growth revealed adenocarcinoma. We found 4 adenocarcinoma and 4 benign ulcers from the endoscopic biopsy of 8 gastric ulcer cases. Biopsy from 3 pyloric channel ulcers revealed benign lesion and 1 duodenal stricture revealed chronic granulomatous lesion suggestive of tuberculosis. We found 29 (58%) patients of malignant cases of gastric outlet obstruction and 21 (42%) patients of benign cases of gastric outlet obstruction. The mean difference was statistically significant ($P < 0.05$) between benign and malignant group.

Conclusion: Among the patients of gastric outlet obstruction, now malignant cases are found more frequently than benign cases. Endoscopic biopsy and histopathology may be considered as the most effective tool for assessing the etiopathology of gastric outlet obstruction.

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Introduction

In Bangladesh, the exact incidence or data regarding the causes of gastric outlet obstruction is not available. Gastric outlet obstruction is the clinical and pathophysiological result of any disease process that causes a mechanical impediment to gastric emptying. Clinical entities that can cause gastric outlet obstruction are generally divided into two categories: benign and malignant. This classification facilitates discussion of management and treatment. When peptic ulcer disease (PUD) was more common, benign causes were the most common; however, one review found that only 37% of patients with gastric outlet obstruction have benign disease, with the remainder having obstruction due to malignancy.¹ Historically, gastric outlet obstruction has been considered a disease process synonymous with chronic peptic ulcer disease, of which it remains to be the third most frequent complication after hemorrhage and perforation. In 1965, a study of 217 patients with gastric outlet obstruction found that the etiology was 91% peptic ulcer and 6% malignancy.² However, since the introduction of proton pump inhibitors, the complications of peptic ulcer disease have decreased dramatically, owing to a shift in the ratio of benign to malignant gastric outlet obstruction.³ Despite numerous endoscopic and radiological studies, in an American study,⁴ four patients had malignancy that had not been suspected prior to surgery. Ahmed et al reported the frequency of malignant gastric tumors was fourth in males (1.43%) and fifth in females (1.02%).⁵ From 1992 to 2001, another local study at the Armed Forces Institute of Pathology discovered that gastrointestinal malignancies accounted for approximately 10.8% of all malignant tumors⁶. In Liaquat National Hospital, Karachi and Isra University Hospital, Hyderabad, Pakistan, a prospective study was carried out in 52 patients from July 2000 to

September 2006. Gastric carcinoma was the most common cause of gastric outlet obstruction seen in 35% (18 patients) of the cases. The next common etiology was peptic ulcer in 29% (15 patients) of the cases followed by carcinoma pancreas in 12% (6 patients) cases and tuberculosis accounts for 3.85% (2 patients) cases.⁷ In a study⁸ in females, 24 tumors were found among 2770 patients, making it the fifth most common GI tumor after oesophageal, gall bladder, liver, and colorectal tumors. In another study,⁹ it was reported that a complicated duodenal or pyloric ulcer caused 51 (81%) of the 63 proven cases of gastric outlet obstruction, pyloric tuberculosis caused 11%, gastric cancer caused 5%, pancreatic cancer caused 2%, and adhesions caused 2%. In a study¹⁰, there were 65 cases of gastric cancer and four other malignant conditions. From 1976 to 1985 there were 22 cases of gastric outlet obstruction secondary to duodenal ulceration and two were due to other benign causes; there were 24 cases of gastric cancer. The objective of this study was to determine the etiopathology of gastric outlet obstruction in patients who presented with its clinical symptoms.

Methods

Between September 2012 to February 2013, this prospective observational study was conducted in the surgery department of Rangpur Medical College Hospital, Rangpur, Bangladesh. In total 50 patients presenting the features of gastric outlet obstruction were included in this study as the study subjects. A convenient purposive sampling technic was used in sample selection. Registration schedules, editing computerization, preparing dummy tables, analyzing and matching data were all part of the data processing work. Permission was obtained from the ethical committee the hospital authority. All patients provided written informed consent. They had the option to leave the study at any time. A

standard data collection sheet was made. Then the data were pretested. The pretest ensured that the respondents were able to understand and answer accordingly. All the demographic as well as clinical information of the participants were recorded. For assessing the etiopathology of gastric outlet obstruction, besides of clinical evaluation, reports of several investigations along with endoscopic biopsy and histopathology were recorded and analyzed. Prior to data collection both verbal and written consent was taken from the respondents and data were checked and edited after collection. Results were calculated by standard statistical formulae. An analysis plan was developed keeping in view with the objectives of the study.

Results

The total number of patients in this series for this study was 50. The mean $\pm$ SD age of the participants was 46 ± 13.71 years ranged from 16 to 80 years. Group 41-50 years had the most patients. Only two patients were over the age of 70, and none were under the age of 16. All of the patients complained of vomiting, which was induced in the majority of cases, was massive in amount, contained undigested and partially digested food materials and was devoid of bile. Out of 50

patients, 44 were able to do endoscopic examination of upper GIT. Endoscopic biopsy was taken from 34 patients. Histopathology reports revealed adenocarcinoma of the 22 cases of antral growth. There were 4 adenocarcinoma and 4 benign ulcers from the endoscopic biopsy of 8 gastric ulcers. Biopsy from 3 pyloric channel ulcers revealed benign lesion and 1 duodenal stricture revealed chronic granulomatous lesion suggestive of tuberculosis. Ultrasonography was used for staging in suspected malignant cases. Ascites was found in 13 of the cases, indicating inoperability. In 3 cases, a mass in the pancreatic head region with CBD dilatation was discovered. Malignant causes of gastric outlet obstruction were more common than benign causes. There were 29 patients with malignant gastric outlet obstruction (58%), and 21 patients with benign gastric outlet obstruction (42%). P-value was calculated by using an unpaired t-test (S=significant). Malignant cases were more common in the sixth decade, while benign cases were more common in the fourth decade. The benign and malignant groups had mean (SD) ages of 37.4 (± 10.1) and 52.2 (± 12.7) years, respectively. The mean difference between the benign and malignant groups was statistically significant ($P < 0.05$).

Table I: Age distribution of the patients.

Age groups (Years)	Number of patients	Percentage
≤ 20	1	2
21-30	6	12
31-40	12	24
41-50	13	26
51-60	11	22
61-70	5	10
71-80	2	4
Total	50	100

Table II: Presenting complaints of the patients

Presenting complaints	Number of patients	Percentage
Vomiting	50	100
Epigastric pain	33	66
Epigastric fullness	31	62
Haematemesis and/or melaena	17	34
Epigastric lump	13	26
Heart burn	21	42
Dyspepsia	24	48
Loss of appetite	31	62
Weight loss	33	66
Jaundice	03	06
Evening rise of temperature	01	02
Convulsion	01	02

Table III: Findings of barium meal X-ray of stomach and duodenum (n=47)

Radiological findings	Number of patients	Percentage
Dilatation of stomach	24	51.06
Deformed duodenal cap	19	40.42
Persistent irregular filling defect in the distal part of the of the stomach	20	42.55
Failure of the dye to pass beyond the duodenum	23	48.93

Table IV: Endoscopic findings of upper GIT (n=44)

Endoscopic findings	Number of patients	Percentage
Antral growth	22	50
Active gastric ulcer	8	18.18
Active duodenal ulcer	5	11.36
Pyloric channel ulcer	3	6.81
Duodenal stricture	1	2.27
Failure to negotiate the duodenum	29	65.90
Normal findings	4	9.09

Table V: Histopathology reports of endoscopic biopsy (n=34)

Histopathology report	Number of patients	Percentage
Adenocarcinoma	26	76.47
Chronic benign ulcer	7	20.58
Chronic granulomatous inflammation with Langhans type giant cell in the duodenal wall suggestive of tuberculosis.	1	2.94

Table VI: Ultrasound findings of abdomen (n=29)

Findings	Number of patients	Percentage
Ascites	13	44.82
Metastatic lesions in liver	6	20.68
Mass in the head of pancreas	3	10.34
Dilated CBD	3	10.34
Normal findings	11	37.93

Table VII: Percentage of benign and malignant causes of gastric outlet obstruction

Etiology	Number of Patients n=50	Percentage
Benign	21	42
Malignant	29	58
Total	50	100

Table VIII: Etiology of gastric outlet obstruction in relation to age

Age group	Benign n=21	Malignant n=29	P-value
≤20	1	0	0.001 ^s
21-30	4	2	
31-40	8	4	
41-50	6	7	
51-60	2	9	
61-70	0	5	
71-80	0	2	
Mean± SD	37.4±10.1	2.2±12.7	
Range (min - max)	16–56	28–75	

Discussion

This study aimed to determine the etiopathology of gastric outlet obstruction in patients who presented with its clinical symptoms. Gastric outlet obstruction is frequently linked to cancer and peptic ulcer disease.¹¹ Pyloric stenosis caused by peptic ulceration was previously more common. With the decrease in the incidence of peptic ulceration and the introduction of effective medical treatments, gastric outlet obstruction should now be considered malignant until proven otherwise, at least in the western world¹². In this study, out of 50 patients, 29 (58%) had malignancy (Antral carcinoma of the stomach in 52% and carcinoma head of the pancreas in 6%) and 21 (42%) had benign diseases (Chronic duodenal ulcer in 40% and tuberculosis in 2%) as the cause of gastric outlet obstruction. In a 1998 study from India, malignancy was found to be the cause of gastric outlet obstruction in 76% of patients¹³. Interestingly, a study of 64 patients from Nigeria from 1991 to 1996 found chronic duodenal ulcer to be the most common cause (66%) of gastric outlet obstruction, while stomach carcinoma was seen in only 15% of

cases.¹⁴ The patients' mean age was 46, and the majority of them were in their fourth, fifth, and sixth decades of life, which contradicts another study in which 68 patients with gastric outlet obstruction were studied, and the peak incidence was in their sixth and seventh decades of life.¹⁵ Vomiting was a common symptom in all patients (100%) in this series, drawing attention to the possibility of a clinical diagnosis of gastric outlet obstruction. Sixty-six percent of the patients reported epigastric pain. Hematemesis and melena revealed that 34% of the patients were bleeding. In this study, 62% of patients reported epigastric fullness, and 26% reported an epigastric mass, indicating advanced malignant disease. Anorexia and weight loss were observed in over 65% of the patients. Around 40% of the patients had dyspepsia and heartburn. Endoscopy of the upper GI tract was performed on 44 patients (88%) of them antral growth occurred in 22 patients, and 8 patients had gastric ulcer. Five patients had active duodenal ulcers, and three had pyloric channel ulcers. In 34 cases, biopsy was performed, and in 29 cases, the scope could not be negotiated. Histopathology of

endoscopic biopsy revealed adenocarcinoma in 24 patients, chronic benign ulcer in 7 patients, and chronic granulomatous lesion in 1 patient. It was similar to the study in which endoscopy detected two cases of cancer that radiology missed¹⁵. In 29 patients, abdominal ultrasonography revealed ascites in 13 patients, liver metastasis in 6 patients, and pancreatic tumor in 3 patients. As a result, ultrasound can aid in the diagnosis of advanced gastric cancer as well as extra-gastric cancers. All patients diagnosed clinically with gastric outlet obstruction due to peptic ulcer disease were initially given conservative management for one week. This conservative treatment, which included gastric lavage, intravenous fluids, and an H-2 receptor blocker, was effective in 8 patients. Bed rest, rehydration, gastric lavage, and milk drinks have the added benefit of causing an ulcer to heal and inflammatory changes to subside, allowing the obstruction to relieve.¹⁶ The fallacy is that such improvement is frequently visible even when the cause of the obstruction is cancer¹⁷. Again, the recurrence rate of those patients treated medically is 15% within the first year after an initial episode of obstruction, with an additional 10% recurrence rate within the next 8 years. Long time follow-up is expected for this group of patients^{18,19}. Malignancy (58%) was the most common cause of gastric outlet obstruction in this study, with gastric malignancy accounting for 52% and extra-gastric malignancy accounting for 6%. This study suggests that the etiology of gastric outlet obstruction is shifting to malignant causes in developing countries such as Bangladesh. Until 1970, benign disease was responsible for the vast majority of adult cases of gastric outlet obstruction, with malignancy accounting for only 10 to 39 percent of cases life.^{10,16} In contrast, cancer has been responsible for 50 to 80 percent of cases in recent decades.²⁰

Limitation of the Study

This study had a single focal point and small sample size. Additionally, the study was completed in a very condensed amount of time. Therefore, the findings of this study do not accurately capture the overall situation in the country.

Conclusion

According to the findings of this study we can conclude that among the patients of gastric outlet obstruction, now malignant causes are found more frequently than benign causes. Endoscopic biopsy and histopathology may be considered as the most effective tool for assessing the etiopathology of gastric outlet obstruction. To get more specific results, we would like to recommend for conducting more studies in several places with larger-sized samples.

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