

A Clinical Study and Management of Gastric Outlet Obstruction in Adults

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Abstract

Introduction: Gastric outlet obstruction implies complete or incomplete obstruction of the distal stomach, pylorus, or proximal duodenum¹. This may occur as an obstruction mass lesion, external compression or as a result of obstruction from acute enema, chronic scarring, and fibrosis or a combination of both.

Aims and Objectives: To determine the relative incidence of benign and malignant gastric outlet obstruction. To study the modes of presentation of gastric outlet obstruction. To study the outcome of management of gastric outlet obstruction.

Materials and Methods: The patients for this study have been selected from Mahatma Gandhi Memorial Hospital attached to Kakatiya Medical College Warangal from March 2013 to September 2014. In total, 50 in-patients of gastric outlet obstruction have been studied attached to Kakatiya Medical College, Warangal from March 2013 to September 2014. In total, 50 in-patients of gastric outlet obstruction have been studied.

Observations and Results: Of the 50 cases of gastric outlet obstruction, 26 had carcinoma antrum, 23 had cicatrized duodenal ulcer, and 1 had gastric outlet obstruction secondary to corrosive ingestion.

Discussion: The discussion is mainly in analysis and observation made regarding the presenting symptoms, signs, investigations, operative findings, management, and post-operative events in 50 cases of gastric outlet obstruction.

Key words: Gastrectomy, Gastric outlet obstruction, Gastrojejunostomy, Upper gastrointestinal endoscopy, Vagotomy

INTRODUCTION

Gastric outlet obstruction implies complete or incomplete obstruction of the distal stomach, pylorus, or proximal duodenum.¹ This may occur as an obstruction mass lesion, external compression or as a result of obstruction from acute enema, chronic scarring, and fibrosis or a combination of both.^{1,2}

Gastric outlet obstruction was described by Sir, James Walton as “The stomach you can hear, the stomach you can feel and the stomach you can see.”

Gastric outlet obstruction is not a single entity and it is the clinical and pathophysiological consequence of any disease process that produces a mechanical impediment to gastric emptying.³

Gastric outlet obstruction may be caused by a heterogeneous group of diseases that include both benign and malignant conditions.^{1,4} In adults, mechanical obstruction due to ulcers, tumors, big polyps is common causes of gastric outlet obstruction.⁵

Until introduction of effective ulcer therapy, duodenal ulcer was the most common cause of gastric outlet obstruction and malignancy was attributed to only 0% of the cases. However, now in the era of H2 blockers and proton pump inhibitors, incidence of duodenal ulcer has been decreasing as symptomatic ulcer begin to respond to medical treatment, although this has not reflected to changes of complication like bleeding and perforation.^{6,7}

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At the same time, the incidence of antral carcinoma of stomach producing gastric outlet obstruction has comparatively increased, which may be due to increased early diagnosis of the condition with the help of flexible fiber optic endoscope.

This study has been taken up to review the changes in the presentation of gastric outlet obstruction in view of changing trends in the management because of new drugs and investigatory modalities. The lack of uniformity in criteria in accepting a case of gastric outlet obstruction lead to differences in incidences and clinical features in different centers, still, any one of the followings can be used to diagnose gastric outlet obstruction. Projective vomiting of undigested food consumed previous day. Palpable hypertrophied stomach. Visible gastric peristalsis (VGP). Gastric succession of stomach on barium meal studies. A gastric residue of more than 500 ml in an adult. An aspirate of more than 40 ml on saline load test. Demonstration at operation of grossly narrowed gastric outlet.

In managing gastric outlet obstruction, measures employed are designed to improve the local condition of stomach, correct fluid and electrolyte imbalance, correct anemia, hypoproteinemia and vitamin deficiency, treatment of etiological conditions.

MATERIALS AND METHODS

The patients for this study have been selected from Mahatma Gandhi Memorial Hospital attached to Kakatiya Medical College Warangal from March 2013 to September 2014. In total, 50 in-patients of gastric outlet obstruction have been studied. Inclusion criteria: Patients presenting with gastric outlet obstruction who are treated on in-patients basis. Patients willing for investigations and treatment. Exclusion criteria: Patients aged 20 years and below. Pregnant females, patient with a recent history of any abdominal surgeries. An elaborate study of these cases with regard to the history, clinical features, routine and special investigations, pre-operative treatment, operative findings, post-operative management, and complications in post-operative period is done.

In history, details were noted about presenting complaints, duration, history of acid peptic disease, features of metabolic disturbances, occupation and personal history including diet, bowel and bladder habits, smoking, and alcoholism. Through analysis of the findings of physical examination done, which included hydration status, VGP, mass, succession splash, hepatomegaly, and ascites. Associated conditions such as anemia, hypertension, and

diabetes were managed before surgery with physician's advice wherever required.

Hemoglobin level, bleeding time, clotting time, routine urine examination, chest screening, electrocardiogram, blood grouping, fasting blood sugar (FBS) and postprandial blood sugar, blood urea, serum creatinine, serum electrolytes were estimated as a part of general workup for surgery. Special investigations such as barium meal, upper gastrointestinal (GI) endoscopy, and ultrasonography (USG) abdomen were done wherever feasible.

Any one of the following criteria can be used to diagnose gastric outlet obstruction. Projective vomiting of undigested food consumed previous day, palpable hypertrophied stomach, VGP, gastric succession splash 3-4 h after the last meal, delayed emptying of stomach on barium meal studies, demonstration at operation of grossly narrowed gastric outlet.

Management of Cases

Pre-operative treatment included correction of dehydration, metabolic status, anemia, intravenous (IV) H₂ blockers; liquid diet, and antacids were given along with twice a day stomach was for a minimum 3 days. According to the investigation reports and operative findings, definitive surgery was undertaken.

Surgery Performed

Truncal vagotomy with gastrojejunostomy, Billroth II gastrectomy, Billroth II gastrectomy with feeding jejunostomy, posterior gastrojejunostomy, total gastrectomy with Roux-en-Y anastomosis, anterior gastrojejunostomy alone, anterior gastrojejunostomy with limbic anastomosis, and jejunostomy.

Anesthesia

For all cases, general anesthesia was given.

Post-operative Management

The patients were managed by Ryle's tube aspiration and intravenous fluids till the bowel sounds appeared. Oral feeding with fluids was then commenced, solids being given later. Early ambulation was encouraged, especially in elderly patients. Routine antibiotic was given during the immediate post-operative period. Regular monitoring of the temperature, pulse, respiratory rate, and blood pressure was done.

OBSERVATIONS AND RESULTS

Of the 50 cases of gastric outlet obstruction, 26 had carcinoma antrum, 23 had cicatrized duodenal ulcer, and

1 had gastric outlet obstruction secondary to corrosive ingestion.

Causes	Number of cases (%)
Carcinoma antrum	26 (52)
Cicatrized duodenal ulcer	23 (46)
Corrosive ingestion	01 (02)
Total	50 (100)

Personal History in Present Series

1. Socioeconomic status: Majority of the patients were from low socioeconomic status
2. Diet: 90% of patients were taking mixed diet and 10% patients were taking vegetarian diet. 39 patients (78%) had history of irregular diet habits
3. Smoking: 68% of the patients were smokers in this series and 32% were non-smokers
4. Alcohol: 66% of the patients in this series gave history of consuming alcohol.

Investigations

The following investigations were carried out before subjecting the patient for surgery. hemoglobin percent, FBS, blood grouping, serum electrolytes, urine routine, chest X-ray, ECG, barium meal examination, endoscopy, and USG examination done whenever possible. hemoglobin percent in majority (70%) of patients was 11 g%.

Barium Meal Examination

Done in 14 cases, in 8 cases filling defect in the antrum was present. Dilated stomach with delayed emptying and deformed cap was present in 6 cases.

Upper GI Endoscopy

Done in all cases, 26 cases of pyloric carcinoma diagnosed and confirmed with biopsy. 23 had cicatrized duodenal ulcer.

Ultrasonographic Examination

Done in 32 cases, carcinoma pyloric region with ascitis was present in four cases. Ascitis with liver secondaries was present in 1 case. The rest showed normal study.

Serum Electrolytes

In the present series, all patients were subjected to serum electrolyte estimation, out of them 9 patients showed electrolyte imbalance. All patients underwent pre-operative treatment to get the optimum metabolic status. The pre-operative treatment included liquid antacid and IV ranitidine. Stomach as using number 16 Ryle's tube with normal saline was given twice a day for 3 days before surgery.

All the patients were kept nil orally and on Ryle's tube aspiration for during varying from 3 to 10 days. Oral

sips were allowed after removal of Ryle's tube. IV fluids were stopped on the 5th to 10th post-operative day and patients started in semisolid diet. The patients were put on broad spectrum antibiotics, IV H2 receptor blockers, and analgesics.

Post-operative Complication

Wound infection developed in two patients who were treated by repeated dressing and appropriate antibiotics. In four patients respiratory tract infection developed which was treated by chest physiotherapy and review of antibiotics. 5 patients of antral carcinoma were treated postoperatively by chemotherapy with 5-fluoro uracil. 18 patients of antral carcinoma were referred to MNJ Cancer Institute, Hyderabad, for further management. One patient of carcinoma pyloric region died on the 9th post-operative day. Rest of the patients had an uneventful post-operative period. Post-operative hospitalization ranged from 7 to 40 days with an average of 11 days.

DISCUSSION

The discussion is mainly in analysis and observation made regarding the presenting symptoms, signs, investigations, operative findings, management, and post-operative events in 50 cases of gastric outlet obstruction admitted to Mahatma Gandhi Memorial Hospital Warangal during March 2013 to September 2014. Out of 50 cases:

- Gastric outlet obstruction secondary to carcinoma pyloric region - 26
- Gastric outlet obstruction secondary to cicatrized duodenal ulcer - 23
- Gastric outlet obstruction secondary to corrosive ingestion - 1.

The most common cause of gastric outlet obstruction is carcinoma of the pyloric antrum. The next most common cause is cicatrized duodenal ulcer. These observations reveal that the incidence of gastric outlet obstruction secondary to chronic duodenal ulcer as come down while that of malignancy has relatively increased. In this study, the most patients were in the sixth and seventh decade. In chronic duodenal ulcer cases, the maximum incidence seen in the age group of 31-40 years. The average age being 47.52 years with span from 22 to 73 years. Men outnumbered women by 10:5:1. In the series of Fisher *et al.*, the average age was 54 with span from 20 to 89 years and men outnumbered women by 2:1.

In antral carcinoma case, the maximum incidence is seen in the age group of 61-70 years. The youngest age of presentation is 32 years and oldest is 84 years with average being 59.73 years. Men outnumbered women by 5:25:1 as

compared to 5:5:1 observed by Yogiram and Chowdary. This higher incidence in males worldwide can be explained as because of more consumption of gastric irritants by males compared to females. 52% of the patients were manual laborers who gave a history of irregular diet habits, which seemed to contribute to disease process. The series of Donald D. Kozoll and Karl A. Meyer also showed the same pattern with the non-skilled day laborer group listed most frequently with obstruction.

In this series, 68% of patients had history of smoking and 66% had history of alcohol intake. Donald D. Kozoll and Karl. A. Meyer reported this to be 7602 and 523%, respectively. These points to the commonly observed fact that a higher incidence of the use of alcohol and tobacco is seen in these patients and are significant risk factors.

Postprandial vomiting and epigastric pain are the main symptoms (96%) in this series. Vomiting is usually spontaneous and projectile type containing partially digested food particles. Other symptoms included anorexia (84%), weight loss (72%), postprandial epigastric fullness (68%), hematemesis (24%), malena (64%), and constipation (48%). In the series of Micheal L. Scwartz *et al.*, postprandial vomiting was the most common symptom (91%). Other symptoms included epigastric pain (86%) and weight loss (52%).

In the series of yogiram and chowdary epigastric pain was the most common symptom (87%). Other symptoms included postprandial vomiting (80%) and constitution (30%) Keith A. Kelly in his series reported intractable vomiting and weight loss in 54% of patients and upper gastrointestinal hemorrhage in 34%. Weight loss was seen in 59.5% of patients in the series of Donald D. Kozoll and Karl A. Meyer and 32% in the series of Harvey J. Dworken and Harold P. Roth. Thus, weight loss seemed to be significant in patients with pyloric obstruction and this point to the long-standing nature of the disease and the need for proper pre-operative nutritional supplementation in these patients.

In carcinoma pyloric antrum cases, pain (96.15%) was the leading symptom. Other symptoms included vomiting (92.30%), anorexia (84.62%), weight loss (65.4%), and postprandial fullness (57.70%). Hematemesis was present in 26.92%, malena in 69.23% and constipation in 50%.

Pain, vomiting, anorexia, and postprandia fullness (100%) were the leading symptoms in gastric outlet obstruction due to other causes. Pallore was present in 56% and dehydration was present in 22%.

VGP was seen in 69.56% of cicatrized duodenal ulcer cases. In the series of Yogiram and Chowdhary VGP was present in 74%.

Succession splash was seen in 65.22% of cicatrized duodenal ulcer cases while Harold Ellis observed succession splash in 64% of his cases.

VGP (38.46%) and succession splash (50%) were less prominent in malignant cases. This corresponds in observation mad by Harold Ellis Palpable mass was present in 34.62% of malignant cases.

Blood group "O" was common in cicatrized duodenal ulcer patients (52.18%) followed by blood Group "A" (26.08%). This is significant as persons of blood Group "O" are about three time more likely to develop acid peptic disease than persons of other blood groups. Blood group "A" was common in malignant cases (50%). In the present series, 100% of cicatrized duodenal ulcer patients underwent truncal vagotomy with gastrojejunostomy.

In carcinoma antrum cases, 26.92% of the patients underwent Billroth II Polya gastrectomy and 42.30% patients underwent anterior gastrojejunostomy. 2 cases (7.70% underwent Roux-en-Y anastomosis after total gastrectomy while 3 cases (11.54%) underwent anterior gastrojejunostomy with limbal anastomosis. The remaining 3 cases underwent Billroth II gastrectomy with feeding jejunostomy. All the patients were subjected to a standard pre-operative treatment, which included stomach wash twice a day for 3 days before surgery. Preoperatively stomach was dilated in the majority of the cases. Postoperatively aspiration was continued till bowel movements established by noting bowel sounds, passing of flatus and gross reduction in quantity of Ryle's tube aspiration. Later on, patients were allowed to take oral fluids and then liquid and solid diet.

In this series, two patients had wound infection and were treated by repeated dressing and appropriate antibiotics. Four patients had respiratory tract infection and were treated by review of antibiotics and chest physiotherapy.

One patient of carcinoma pyloric region died on the 9th post-operative day.

The overall mortality rate was 2% (3.85% for malignant cases). Mortality rate was zero in case of stenosing duodenal ulcer.

Most of the stenosing duodenal ulcer cases were lost for follow-up. There has been no recurrence of symptoms in any of the cases that turned up for follow-up.

CONCLUSION

Since the study has been based on a small number of cases, with a limited follow-up, it is rather difficult to come to

definite conclusions. However, some of the conclusions which can be drawn from this series are as follows:

1. The most common causes of gastric outlet obstruction in adults are carcinoma stomach with antral growth producing gastric outlet obstruction (52%) and cicatrized duodenal ulcer (46%)
2. In the vast majority of cases, the diagnosis can be established clinically
3. Upper gastrointestinal endoscopy should be mandatory in all suspected case of gastric outlet obstruction. It can diagnose the cause of obstruction very effectively than any other investigative modality
4. Number of cases with cicatrized duodenal ulcer as the chief etiological factor for gastric outlet obstruction is diminishing, and the number of cases of antral carcinoma of stomach as the cause of gastric outlet obstruction is increasing

5. Effective treatment in carcinoma stomach depends on early diagnosis.

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