

 <p>ISSN NO. 2320-5407</p>	<p>Journal Homepage: - www.journalijar.com</p> <h2 style="text-align: center;">INTERNATIONAL JOURNAL OF ADVANCED RESEARCH (IJAR)</h2> <p style="text-align: center;">Article DOI: 10.21474/IJAR01/3005 DOI URL: http://dx.doi.org/10.21474/IJAR01/3005</p>	 <p>INTERNATIONAL JOURNAL OF ADVANCED RESEARCH (IJAR) ISSN 2320-5407 Journal homepage: http://www.journalijar.com Journal DOI: 10.21474/IJAR01</p>
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RESEARCH ARTICLE

Etiological profile of gastric outlet obstruction and its treatment: a hospital based prospective study in a tertiary care center, north-east India.

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Manuscript Info

Manuscript History

Received: 28 November 2016
Final Accepted: 27 December 2016
Published: January 2017

Key words:

Gastric outlet obstruction, duodenal ulcer, antral carcinoma, gastric bazoar, pseudo pancreatic cyst, carcinoma head of the pancreas.

Key message:

Etiology of GOO is changing from benign to malignant pathology in present era.

Abstract

Background: Gastric outlet obstruction (GOO) also known as pyloric obstruction is the clinical & patho-physiological consequence of any disease process that produces a mechanical impediment to gastric emptying.

Aims & Objectives: To identify the causes, review the modes of clinical presentation and evaluate diagnostic methods & management strategies of GOO in adults.

Material & Methods: A prospective observational study conducted in 70 patients attending dept. of surgery, Silchar Medical College and hospital, a tertiary care center during the period of July 2014 to December 2016 of G.O.O. were included in this study. Causes of functional non-mechanical cause of G.O.O were excluded. Only patients of 20 years & above were included in this study. Saline load test, upper gastro-intestinal endoscopy and routine laboratory investigations were done in all cases while Barium meal study was done in few cases to make the diagnosis.

Results: Age group of 50-59 was maximum sufferers 40%, followed by age group 40-49 with 30% sufferers. Male-Female ratio was 1.9:1. Antral carcinoma (60%) followed by cicatrized duodenal ulcer seen in 34% of the cases; two case was due to gastric bazoar (3%), one case was due to pseudo-pancreatic cyst and one case was due to carcinoma head of the pancreas.

Conclusion: In vast majority of cases, GOO diagnosis can be established clinically. Males are more sufferers and antral carcinoma is main cause of G.O.O. After proper diagnosis, relief can be given to patients by surgical treatment. The type of procedure depends on underlying cause.

Abbreviations:

GOO-Gastric outlet obstruction, VGP-Visible gastric peristalsis, DU-Duodenal ulcer, CA-Carcinoma.

Introduction:-

Gastric outlet obstruction (GOO, also known as pyloric obstruction) is the clinical and patho-physiological consequence of any disease process that produces a mechanical impediment to gastric emptying. Clinical entities that can result in GOO are generally categorized into 2 groups - benign and malignant. This classification facilitates discussion of investigations and treatment. Until the late 1970s, benign disease was responsible for the majority of cases of GOO in adults, while malignancy accounted for only 10 to 39 percent of cases [1, 2]. By contrast, in recent decades, 50 to 80 percent cases have been attributable to malignancy [2, 3, 4].

GOO can be a diagnostic and treatment dilemma. As part of the initial workup, the possibility of functional causes of obstruction, such as gastroparesis due to diabetes or paralytic ileus due to any metabolic cause should be excluded. Once a mechanical obstruction is confirmed, definitive treatment is based on recognition of the specific underlying cause i.e. benign and malignant. Diagnosis and treatment should be done as early as possible, as delay may result in further compromise of the patient's nutritional status and also increase the oedematous tissue, which complicate surgical intervention.

Cicatrised DU was the most common cause of GOO [1] but due to wider usage of H2 blockers and PPIs, better health care facilities with new investigating equipments & techniques, its incidence is on decline and is replaced by carcinoma stomach which is detected early by new investigating modalities.

The lack of uniformity in criteria in accepting a case of GOO lead to differences in incidences and clinical features in different centres, still, any one of the following can be used to diagnose gastric outlet obstruction.

1. Projectile vomiting of undigested food consumed previous day.
2. Visible gastric peristalsis (VGP).
3. Gastric succussion splash 3-4 hours after the last meal.
4. Palpable hypertrophied stomach.
5. Delayed emptying of stomach on barium meal studies.
6. A gastric residue of more than 500 ml in an adult.
7. An aspirate of more than 250 ml on saline load test.

Aims & objectives:-

1. To identify the causes of GOO in adults.
2. To review the changes in presentation of GOO in view of changing trends in the management because of new drugs and investigatory modalities.
3. To evaluate diagnostic methods and management strategies of GOO in adults.

Material and Methods:-

This is a clinical observational study comprising of 70 consecutive cases of GOO in adults due to various causes. Patients for the study were selected from the surgical units of *Silchar Medical College and hospital, Silchar during the period of July 2014 to December 2016.*

The pre-requisites for selecting a patient in this study were as follows:

1. One or more of the following clinical features; projectile vomiting, especially persistent vomiting of undigested food; gastric succussion splash heard 3-4 hours after the last meal; visible gastric peristalsis or presence of a palpably distended and hypertrophied stomach.
2. Fasting overnight gastric aspirate more than 200ml.
3. Saline load test of Goldstein: The volume of saline remaining half an hour after instillation of 600 ml of 0.9% NS solution. Any volume more than 250 ml. was considered significant.
4. Upper Gastro intestinal endoscopy demonstration / Radiological demonstration of gastric outlet obstruction.
5. Demonstration at operation of gross narrowing of the gastric outlet.

The cases that were willing to undergo surgery, 20 years or more in age, irrespective of sex were included in this study while patient having functional cause of obstruction were excluded. After admission of the patient a detailed clinical history was taken. Physical examination was carried out in detail, noting the state of hydration and

nutritional status. Particular attention was paid to abdominal examination for the presence of VGP, tenderness, palpable masses and succussion splash.

On the basis of the history and physical findings, a diagnosis of GOO was made and the patient investigated. Saline load test performed bedside in every patients.

Results and Observations:-

The clinical material for this study consists of 70 adult patients with gastric outlet obstruction. All these patients were selected from the general surgical units of Silchar Medical College & Hospital, Silchar. A thorough study of these cases was made regarding the history, clinical examination, investigations, operative findings, treatment, post-operative management and tables & figures are depicting clinical parameters is also presented.

Out of 70 cases, 42(60%) cases had malignant growth in the gastric antrum as shown in figure 2, 24(34%) cases had cicatrized duodenal ulcer as shown in figure 1, 2(3%) had gastric trichobezoar, 1(1.5%) had pseudo pancreatic cyst and 1(1.5%) had carcinoma head of the pancreas as the cause of gastric outlet obstruction. Distribution according pathology is shown in Table 1.

Table 1. Distribution according to pathology.

Sl. No.	Cause	Male	Female	Total no. Of cases	Percentage
1	Cicatrized duodenal ulcer	14	10	24	34%
2	Antral carcinoma	30	12	42	60%
3	Gastric trichobezoar	01	01	02	03%
4	Pseudo pancreatic cyst	00	01	01	1.5%
5	carcinoma head of the pancreas	01	00	01	1.5%

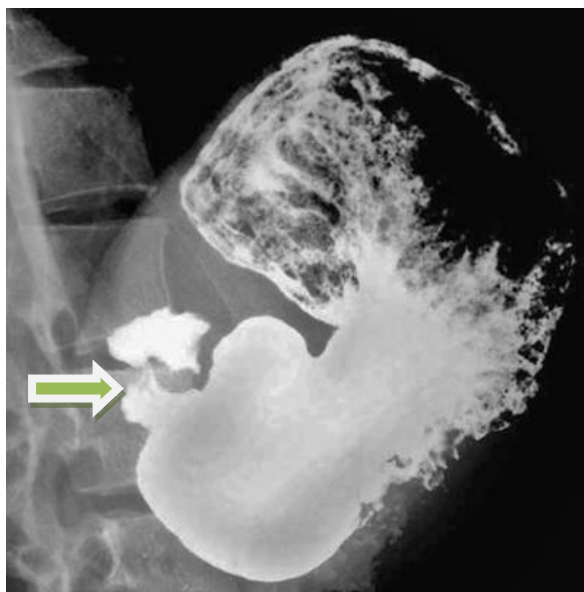


Figure 1:- Barium meal X-ray showing GOO pyloric stenosis due to chronic DU.

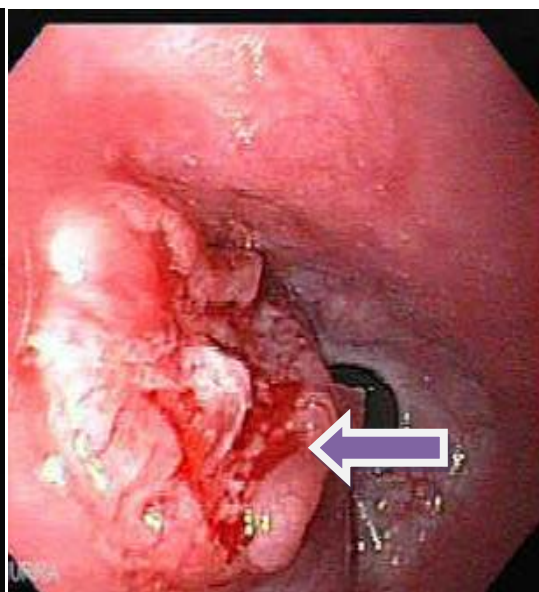
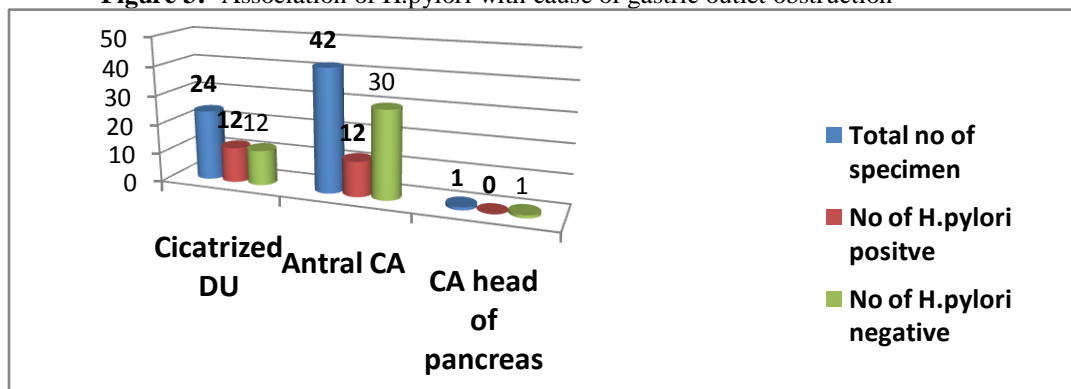


Figure 2:- Endoscopy showing GOO due to antral carcinoma.

The endoscopic biopsy specimen from gastric mucosa was taken from 67(95.7%) cases, except for GOO due to gastric trichobezoar and pseudo pancreatic cyst. 50% of cicatrised duodenal ulcer cases were H.pylori positive. H.pylori quick test results are shown in figure 3.

Figure 3:- Association of H.pylori with cause of gastric outlet obstruction

The maximum incidence (40%) of GOO was seen in 50-59 years of age of which 28.5% was due to antral carcinoma, while 40-49 years age group incidence was 30% of which 20% was due to cicatrized DU, one case of pseudo pancreatic cyst was seen in 30-39 years of age group, one case of carcinoma head of the pancreas was seen in 60-69 years age group. and two cases of gastric Trichobezoar was seen as a cause of G.O.O. Distribution according to underlying pathology is shown in table 2.

Table 2:- Age Distribution with underlying pathology.

Age	Cicatrized DU(%)	Antral CA(%)	Gastric bezoars(%)	Pseudo pancreatic cyst (%)	CA head of pancreas(%)	Total(%)
20-29	-	-	01(1.5%)	-	-	01(1.5%)
30-39	03(4%)	01(1.5%)	-	01(1.5%)	-	05(07%)
40-49	14(20)	07(10%)	-	-	-	21(30%)
50-59	7(10%)	20(28.5%)	01(1.5%)	-	-	28(40%)
60-69	-	14(20%)	-	-	01(1.5%)	15(21.5%)
Total	24	42	02	01	01	40

In this series 46(65.7%) patients were males and 13 (34.3%) patients were female. Male to female ratio (M:F) was 1.9:1 as seen in figure 4.

In this series, 28 patients (40%) were farmers, 18(26%) patients were manual labourers, 10 (14%) patients were Drivers, 9 (13%) patients were housewives and 5 (7%) patients were businessman as seen in figure no 5.

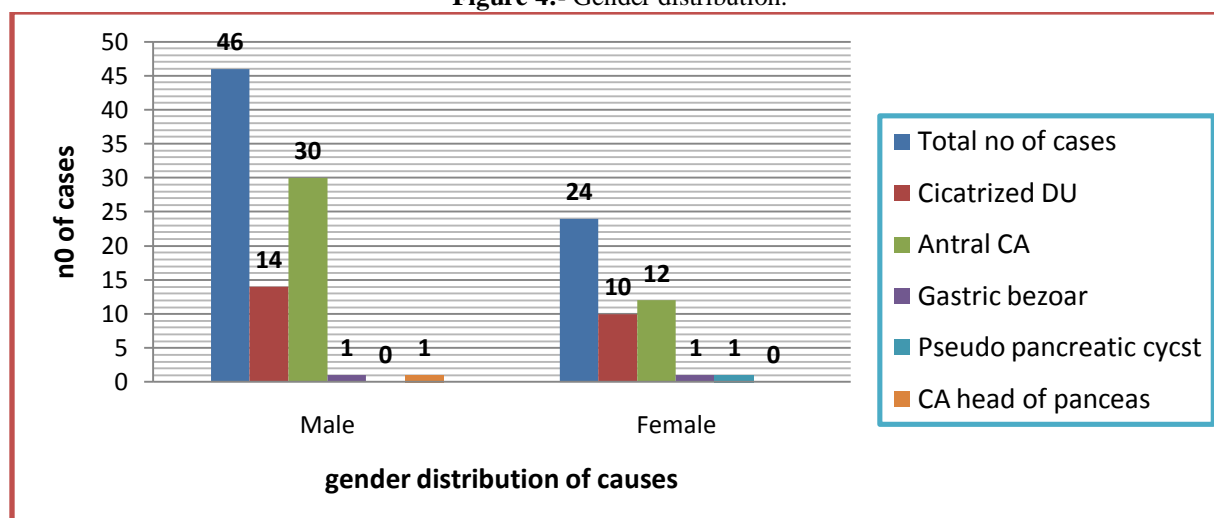
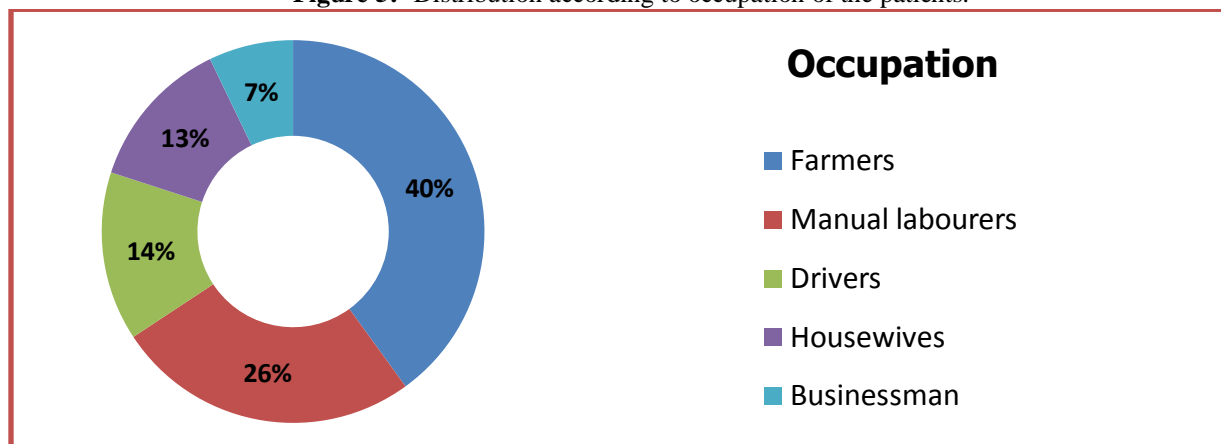
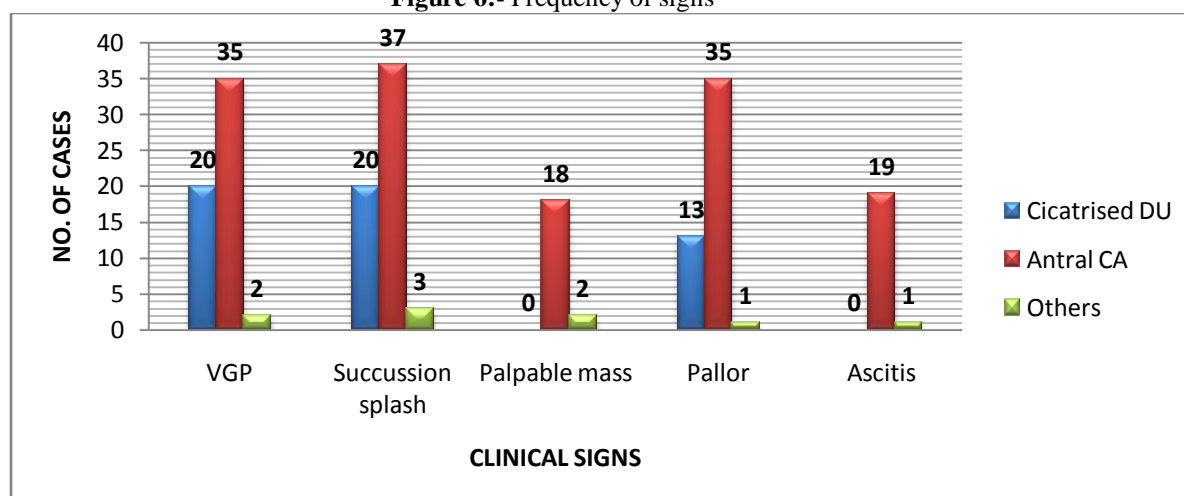
Figure 4:- Gender distribution.

Figure 5:- Distribution according to occupation of the patients.

Pain abdomen and vomiting were found in most of the cases as shown in table 3.

Table no 3:- Distribution of symptoms with their frequency.

Symptom	No. Of cases	Cicatrized DU	Antral CA	Gastric bezoars	Pseudo pancreatic cyst	CA head of pancreas
Pain abdomen	64	24	28	01	01	00
Vomiting	70	24	42	02	01	01
Lump abdomen	21	00	19	00	01	01
Appetite loss	54	11	42	00	00	01
Weight loss	43	08	34	00	00	01
Post-prandial fullness	55	15	37	01	01	01
Melena	25	03	21	00	00	01
Jaundice	02	00	00	00	01	01

Figure 6:- Frequency of signs

Almost 70% to 80% patients with Cicatrised DU and Antral cancer had VGP & succussion splash. More than 45% antral cancer patients had palpable mass, pallor & Ascitis as in figure 6.

Most common surgical operation done was Truncal vagotomy with posterior gastro-jejunostomy for cicatrized duodenal ulcers followed by Billroth II gastrectomy for antral carcinoma, Gastric Trichobezoar were removed by gastrotomy in two cases and pseudo pancreatic cyst was drained by Jurasz Cysto-gastrostomy as shown in table 4.

Table no 4:- Types of surgical procedures done in the study

Cause	Surgical Procedure done	No. of cases	Percentage
Cicatrized DU	Truncal vagotomy with posterior gastro-jejunostomy	24	34%
Antral CA	Billroth II gastrectomy	21	30%
	Anterior gastro-jejunostomy	14	20%
	Palliative feeding jejunostomy	07	10%
Gastric bezoars	Gastrotomy and removal of bezoar	02	03%
Pseudo pancreatic cyst	Jurasz operation(Cysto-gastrostomy)	01	1.5%
CA head of the pancreas	Anterior gastro-jejunostomy with T-tube biliary drainage	01	1.5%

Six patients of antral carcinoma died in post-operative period, four with electrolyte imbalance and the other two because of severe lower respiratory tract infection and septicaemia. Post-operative hospitalization ranged from 8 to 21 days with an average of 14 days. Sutures were removed between 7th and 10th post-operative day.

Follow up:-

All the 64 cases were followed up post operatively for the period of 6 months. All the antral carcinoma patients received chemotherapy post operatively, of 34 patients 15 who underwent Billroth II resection received cisplatin and 5 FU regimen and rest with unresectable disease received epirubicin, cisplatin and 5 fluorouracil (5FU) regimen for 6 cycles at an interval of 21 days. Before every cycle complete blood count, liver and renal functions were assessed and 8 patients lost the follow up after 3 months. All 24 cases of duodenal ulcer were symptom free; Patients with gastric bezoar followed up and were symptom free; also patient with pseudo pancreatic cyst was followed up and he had recurrent attacks of dull aching pain in epigastrium, dyspepsia and was given oral opioid analgesics along with proton pump inhibitor (PPI) and pancreatic enzyme supplementation. On follow up of patient with CA head of pancreas he is found to be jaundice free and receiving adjuvant chemotherapy as in table 5.

Table 5:- follow ups of patients after surgery.

Follow ups	1 month	3 months	6 months	remarks
Cicatrized DU	24	24	-	Symptom free
CA Antrum	34	34	26	All received adjuvant chemotherapy & 8 patients lost follow up after 3months
Gastric bazoar	2	2	-	Symptom free
Pseudo pancreatic cyst	1	1	1	Had recurrent attacks of pain on treatment
CA head of the pancreas	1	1	-	Jaundice free & receiving adjuvant chemotherapy

Discussion:-

The commonest cause of GOO was antral carcinoma & the next common cause was cicatrized duodenal ulcer in our study. These observations were similar to that of McQuaid [5] and Dullas N shone [6] studies.

Until the late 1970's benign disease was responsible for a majority of cases of GOO in adults, while malignancies accounted for only 10 to 39 % of cases. Contrasting to this, in the recent decades due to the discovery of *Helicobacter pylori* and proton pump inhibitors, 50 to 80 percent cases have been attributed to malignancy [7]. Similar findings were observed in McQuaid et al study in 2010 [5]. In Dallas N shone et al study in 2008 [6], cause of G.O.O in 61% (n=20) cases was malignancy and in 39% (n=31) cases was duodenal ulcer.

Most patients were in the fifth & sixth decade in this study. In antral carcinoma cases the maximum incidence seen in the age group of 50-59 years. Life span was 20 to 69 years. In series of Fisher et al [8] the average age was 54 yrs with a span from 20-89 yrs & men outnumbered women by 2:1. Men outnumbered women by 1.9:1 in our study as

compared to 5.5:1 observed by Yogiram Chaudary [9]. This higher incidence in males, worldwide can be explained as because of more consumption of gastric irritants by males compared to females.

In our series 40% of the patients were farmers, 26% manual labourers and 14% were drivers who gave history of irregular diet habits, which seems to contribute to disease process. The series of Donald D Kozoll & Karl A Meyer [10] also showed the same pattern with non-skilled day labourer group listed most frequently with obstruction.

All the cases were subjected to serum electrolyte estimation in our study. Out of them 18 cases (25.7%) showed electrolyte imbalance. In series of Maichel L Schwartz [11] electrolyte imbalance was present in 30%.

Common symptoms and signs in our study were vomiting, pain abdomen & dyspepsia and succussion splash, VGP & pallor respectively.

Upper GI endoscopy was done in all 70 cases (100%). 42 (60%) cases had carcinoma stomach in which 31 cases showed antral growth and other 11 cases showed Prepyloric growth. 24(34%) had cicatrized duodenal ulcer, 2(3%) had gastric bezoar, 1 (1.5%) had pseudo pancreatic cyst and 1 (1.5%) had CA head of pancreas. It is similar as found by Misra SP in 1998 [12]. 50% of cicatrized DU's in this study were H. pylori positive.

Conclusions:-

The present study is a clinical observational study of gastric outlet obstruction. Since the study has been based on a small number of cases with a limited follow up, it will be rather difficult to come to definite conclusions. However some of the conclusions which can be drawn from this study are as follows:-

1. The commonest cause of G.O.O in adults was ca antrum (60%), followed by cicatrized duodenal ulcer (34%).
2. Males are commonly affected with G.O.O in adults.
3. Vomiting and succussion splash are the most common and constant symptom and sign of G.O.O.
4. In the vast majority of cases, the diagnosis can be established clinically. .
5. The saline load test was found to be an effective bed side investigative procedure to assess the degree of G.O.O.
6. Upper gastro intestinal endoscopy should be advised in all suspected cases of G.O.O. It can diagnose the cause of obstruction very effectively than any other investigative modality.
7. Surgical procedure for antral carcinoma depends on stage of disease, operability and resectability of tumour. Majority of patients with duodenal ulcer can be treated with Truncal vagotomy with posterior gastrojejunostomy.

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