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ORIGINAL ARTICLE

GASTRIC OUTLET OBSTRUCTION: AN OVERVIEW CLINICAL PRESENTATION AND ITS SURGICAL MANAGEMENT IN A TERTIARY CARE GOVERNMENT HOSPITAL

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ABSTRACT: INTRODUCTION: Gastric outlet obstruction (GOO) mechanically impedes gastric emptying, normal emptying of the stomach. It is a diagnostic and therapeutic challenge for general surgeons in their daily practice. There is a paucity of publications regarding GOO in our setting. This paper highlights the etiology, clinical presentation and treatment outcome of GOO. **METHODS:** A Prospective study was conducted enrolling patients with GOO treated at Victoria hospital, Bangalore medical college during September 2008 to august 2010. Data was tabulated and analyzed using descriptive statistical methodology. **RESULTS:** carcinoma stomach with antral growth and cicatrized duodenal ulcer (both 41.5%) were the most common cause of gastric outlet obstruction. Male were more affected than females (2.5:1). Most common symptom was vomiting and abdominal pain (noted among all), followed by loss of appetite (83%) and loss of weight (82.35%). 94.1% patients of Cicatrized duodenal ulcer underwent truncal vagotomy with posterior gastrojejunostomy and 5.9% underwent truncal vagotomy with antrectomy. 58.8% patients of carcinoma stomach, underwent distal gastrectomy with ante-colic Roux-en-Y gastro- jejunostomy, 12.1% patients underwent subtotal gastrectomy with ante-colic and Roux-en-Y gastro jejunostomy and 4.8% patients underwent palliative gastrojejunostomy. In corrosive antral stricture Billroth I gastrectomy was done. Patients of pancreatic malignancy underwent palliative anterior gastrojejunostomy and pseudo- pancreatic cyst was treated by cystojejunostomy. The average hospital stay was 12-15 days and an overall mortality of 5.8% for malignant patients was noted. **CONCLUSION:** Study concludes that gastric outlet obstruction is an important and a common surgical condition in tertiary hospital. Malignancy and benign cicatrized duodenal ulcer being the most common cause. Early surgical intervention is of paramount importance to avoid the morbidity and mortality associated with GOO.
KEYWORDS: gastric outlet obstruction (GOO), antral growth, gastrojejunostomy, Victoria.

INTRODUCTION: Gastric outlet obstruction is any disease that mechanically impedes gastric emptying, the normal emptying of the stomach. Gastric outlet obstruction occurs in approximately 2% of patients with chronic duodenal ulcer.[1] Gastric outlet obstruction occurs in no more than 5% of patients with peptic ulcer disease and it accounts for 5% to 8% of ulcer related complications. The peak incidence is now in a much older age.[2]

Etiology can be broadly divided into Acquired and genetic factors. Acquired includes, H. pylori infection, Nutritional (high salt, high nitrate, low vitamin A and C, and smoked food), Occupational (rubber workers, coal workers), cigarette smoking, Epstein Bar virus infection, Radiation Exposure and also Prior gastric surgery for benign gastric ulcer disease. Genetic includes, Type A blood, Pernicious anemia, Family history, Hereditary non-polyposis colon cancer and Li-Fraumeni syndrome

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and certain Precursor Lesions like Adenomatous gastric polyps, Chronic atrophic gastritis, Dysplasia, Intestinal metaplasia and Menetrier's disease. [1-3]

General symptoms include- pain, vomiting, loss of appetite, constipation and loss of weight with ball-rolling movement in the abdomen. Its association with Ca stomach is seen by, offensive vomitus containing coffee ground colored altered blood. Patient may give history of Malena and jaundice. While, that with peptic ulcer, have non-bilious painless vomiting usually in the evening and in advanced patients may occur at any time.

An increase in the number of patients of obstruction seems to be noted secondary to malignancy; this is possibly due to improvements in cancer therapy, which allow patients to live long enough to develop this complication. Hence, an attempt was made to study the most common presenting symptoms, surgical modalities for different etiologies of gastric outlet obstruction among patients attending Victoria hospital, Bangalore.

MATERIALS AND METHODS: After obtaining institute ethical committee clearance study was conducted enrolling a total of 41 patients of gastric outlet obstruction in adults; they were selected from the surgical units of Victoria hospital during the period September 2008 to August 2010. After admission, detailed clinical history along with physical examination, noting the state of hydration and nutritional status was done. On the basis of the history and physical findings, a diagnosis of gastric outlet obstruction was made and the patient was investigated. Saline load test was performed bedside in every patient.[4]

The pre-requisites for enrolment included, persistent vomiting of undigested food, gastric succussion splash heard 3-4 hours after the last meal, visible gastric peristalsis or palpably distended and hypertrophied stomach, overnight fasting gastric aspirate of more than 200 c.c. and Saline load test (Goldstein) of more than 400 ml remnant. Upper Gastro Intestinal Endoscopy was done in all the patients to confirm the diagnosis.

Since upper GI endoscopy was confirmatory in most of the patients. Barium meal study was taken up in very few patients. Other routine investigations which were carried out in all patients included Haemoglobin percentage, Blood grouping, Blood urea, serum creatinine, serum electrolytes, stool examination, urinalysis etc. Gastric lavage with normal saline was carried out four times daily for at least a week before surgery. During this period of local preparation, the patient was allowed only fluids orally.

General anaesthesia and epidural anaesthesia were administered for surgeries, and all the surgical findings were meticulously recorded. Post-op management by Ryle's tube aspiration and Intravenous fluids till the stomach recovered its normal tone and bowel sounds appeared. Oral feeding with fluids was then commenced, solids being given later. Early ambulation was encouraged, especially in elderly patients. Routine antibiotics were given during the immediate post-operative period. Data was collected, tabulated and analysed using descriptive statistical methodology.

RESULTS: Of the total 41 patients, 17 patients had malignant growth in the antrum, 17 had cicatrized duodenal ulcer, 4 had pancreatic mass with extrinsic compression and 3 had corrosive antral strictures as the cause for gastric outlet obstruction. (Table no. 1)

Majority of patients were in the age group of < 40 years (34.1%), followed by 41-50 years (24.4%). Most commonly affected were males (78%) than females (22%). In this series, 16 patients

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(39%) were farmers, 10 (25%) patients were manual laborers, 9 (22%) patients were housewives, 3(7%) patient were a tailor/shopkeeper and 3(7%) were drivers.

The association of smoking and alcohol were consistently seen amongst all patients (100%) of Ca pyloric antrum and cicatrizing duodenal ulcer. (Table No. 2). Symptoms and signs are shown in figure1 &2 and table3. Hb% in 37(90%) patients was < 11 gm%. Urine routine, blood urea and serum creatinine were within normal limits. Blood group O (56.1%) was most common, followed by blood group A (24.4%). Majority of duodenal ulcer patients were having O blood group (76.5%) and among the pyloric antrum malignancy patients 8 patients (47.1%) were having O blood group and 6 patients (35.3%) were having A blood group.

In present study, 29(70.7%) patients had abnormal serum electrolytes (hyponatremia, hypokalemia and hypochloremia) of which, 88.3% (15 of 17 patients) of duodenal ulcer had abnormal serum electrolytes and 8 of 17 (47.1%) patients of carcinoma pyloric antrum showed electrolyte imbalance. Electrolyte disturbance is more pronounced in outlet obstruction secondary to ulcer disease than the malignancy.

Upper gastrointestinal endoscopy was done in all patients, 17(41.5%) patients had pyloric carcinoma which was confirmed with biopsy. 17 (41.5%) had cicatrized duodenal ulcer. 4(10%) patients had outlet obstruction due to extrinsic compression.3 (7%) patients had antral stricture following corrosive injury. Ultrasonography and CT scan was done in patients with malignancy.

In Cicatrized duodenal ulcer, 16 of 17 patients (94.1%) underwent truncal vagotomy with posterior gastrojejunostomy, 1 case underwent truncal vagotomy with antrectomy. In carcinoma stomach, 10 patients underwent distal gastrectomy with ante-colic Roux-en-Y gastro- jejunostomy, 5 patients underwent subtotal gastrectomy with ante-colic Roux-en-Y gastro jejunostomy and 2 patients underwent palliative gastrojejunostomy. In corrosive antral stricture Billroth I gastrectomy was done. 2 patients of pancreatic malignancy underwent palliative anterior gastrojejunostomy and 2 patients underwent cystojejunostomy for pseudo- pancreatic cyst. (Table no. 4)

POST-OP CARE: Wound infection developed in 8 patients, who were treated by repeated dressing and appropriate antibiotic, 6 patients reported respiratory tract infection, which was treated by chest physiotherapy and review of antibiotics. One patient of carcinoma pyloric region had anastomotic leak on 5thpost-operative day, underwent laparotomy and closure of the leak and was discharged after 10 days. Rest of the patients had an uneventful postoperative period. Patient's average duration of stay was 12-15 days.

One patient with Ca stomach died due to poor general condition and electrolyte abnormality during the third post-operative period. Patients were followed up for a period of 3 to 6 months. 10 patients of Ca stomach were put on chemotherapy with 5-flurouracil.5 patients of Ca stomach were lost for follow up. 2 patients succumbed to the disease during the follow up period. One case of duodenal ulcer disease had symptoms at the end of 1 month and underwent revision gastrojejunostomy procedure.

DISCUSSION: IN our study conducted over a period of two years, the incidence of Carcinoma pyloric antrum and cicatrized duodenal ulcer were equal (17 patients), while in study by Harold Ellis [5] series and Balint Spence [6] series incidence of gastric outlet obstruction secondary to cicatrized duodenal ulcer was more common than Carcinoma Pyloric Antrum.

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These observations reveal that the incidence of gastric outlet obstruction secondary to chronic duodenal ulcer could have reduced while that of malignancy has relatively gone up. In our study age of occurrence ranged from 20 to 73 years. In case of obstruction secondary to duodenal ulcer the maximum age incidence is between 5th-6th decades and Men outnumbered women by 2.5:1 as compared to the series of Fisher et al[7],where the average age was 54 with a span from 20-89 and men out numbered women by 2:1 and as compared to 5.5:1 observed by Yogiram and Chowdhary.[8]

This higher incidence in males, worldwide can be explained as because of more consumption of gastric irritants by males compared to females.

About 39% of the patients were farmers and 29% were 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 [9] also showed the same pattern with the non-skilled day laborer group listed most frequently with obstruction. The higher incidence of use of alcohol and tobacco is seen in these patients and are significant risk factors for the disease process.

Abdominal pain was mainly present in the upper abdomen and in 4 patients there was radiation to the back suggesting involvement of the pancreas. Duration of abdominal pain in chronic duodenal ulcer varied from two months to five years. Those patients with long history gave past history suggestive of APD. In 37 patients, the duration of pain was less than 1 year, of which 17 were malignant patients this corresponds to observations of Yogi ram and Chowdhary.[8]

In carcinoma antrum patients the duration of abdominal pain varied from 2 months to 7 months. 14 of 17 patients gave prior history suggestive of acid peptic disease suggesting malignancy developing in gastric ulcer. This corresponds to observations of Richard Robin and Harold Ellis.[5] In the present study 41 patients were subjected to serum electrolyte estimation. Of which 29 patients (70.7%) showed electrolyte imbalance. In the series of Maichel L Schwartz[10] electrolyte imbalance was present in 30%. Blood group O (56.1%) was most common, followed by blood group A (24.4%).

Upper gastrointestinal endoscopy was done in all patients, 17(41.5%) patients had pyloric carcinoma which was confirmed with biopsy. 17 (41.5%) had cicatrized duodenal ulcer. 4(10%) patients had outlet obstruction due to extrinsic compression.3 (7%) patients had antral stricture following corrosive injury. Ultrasonography and CT scan was done in patients with malignancy.

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Rest of the patients had an uneventful postoperative period. Patient's average duration of stay was 12-15 days. Patients were followed up for a period of 3 to 6 months. 10 patients of Ca stomach were put on chemotherapy with 5-flurouracil.5 patients of Ca stomach were lost for follow up.

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CONCLUSION: Study concludes that gastric outlet obstruction is an important and a common surgical condition in tertiary hospital. Malignancy and benign cicatrized duodenal ulcer being the most common cause. Early surgical intervention is of paramount importance to avoid the morbidity and mortality associated with GOO. Further controlled studies are required to strengthen the evidences.

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Causes	Number of patients	Percent (%)
Carcinoma Pyloric Antrum	17	41.5
Cicatrized Duodenal ulcer	17	41.5
Extrinsic compression	4	10
Corrosive injury	3	7
Total	**41**	**100**

Table 1: Distribution according to etiologies of gastric outlet obstruction

Disease	Smoking	Alcohol	Total
Antral cancer	12(70.6%)	10(58.9%)	17 (100%)
Duodenal ulcer	13(76.5%)	12(70.6%)	17 (100%)
Others	2(28.6%)	3(42.9%)	7 (100%)

Table 2: Distribution of patients according to smoking and alcohol habits

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Signs	Total No. of Patients No. (%)	Carcinoma Pyloric Antrum No. (%)	Cicatrized Duodenal ulcer No. (%)	Others No. (%)
Pallor	27(65.9)	15(88.2)	6(35.3)	6(85.7)
VGP	31(75.6)	10(58.8)	17(100)	4(57.1)
Succussion splash	28(70.7)	10(58.8)	15(88.2)	3(42.8)
Palpable mass	15(36.6)	10(58.8)	-	5(71.4)

Table 3: Frequency of Signs

Disease	Procedure	Number	%
Duodenal ulcer (cicatrized)	Truncal vagotomy + posterior gastrojejunostomy	16	94.1
	Truncal vagotomy + Antrectomy	1	5.9
Carcinoma pyloric antrum	Distal gastrectomy + ante-colic Roux-en-Y gastro- jejunostomy	10	58.8
	Subtotal gastrectomy + ante-colic Roux-en-Y gastro jejunostomy	5	29.4
	Palliative gastrojejunostomy	2	11.8

Table 4: Distribution according to surgical procedure underwent

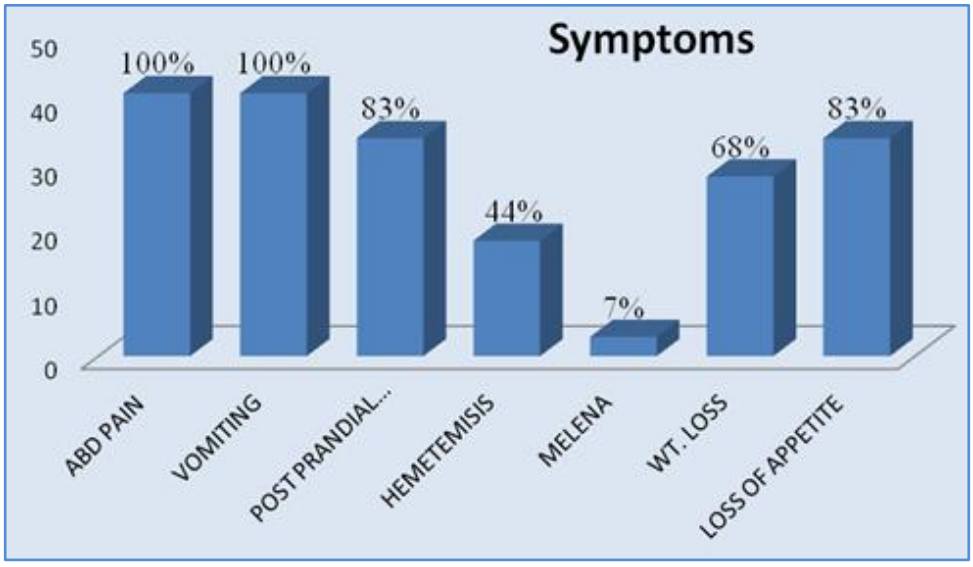

Figure1: Symptoms of the patients

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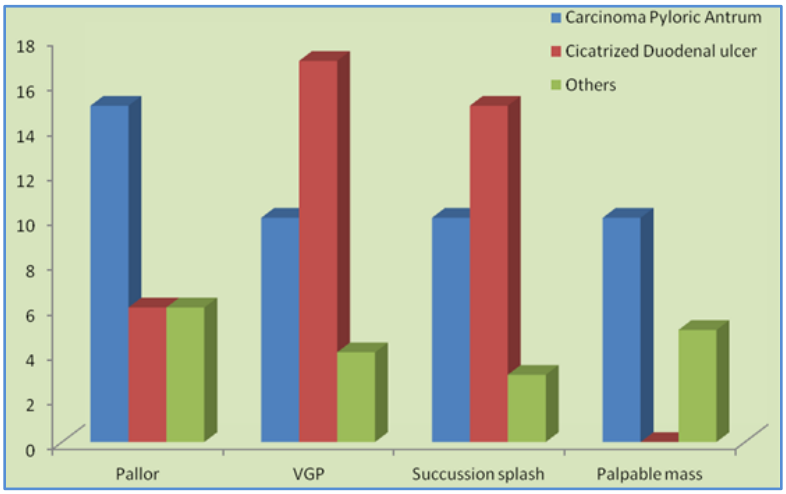

Figure 2: Frequency of signs

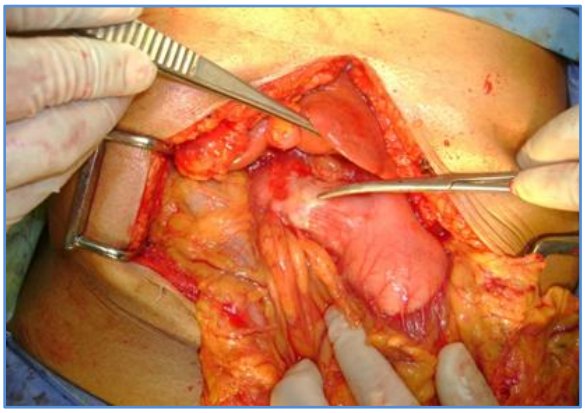

Figure 3: pyloric antrum growth (gastric outlet obstruction)

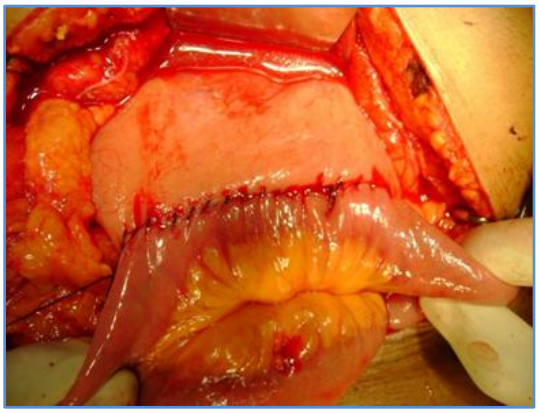

Figure 4: Gastrojejunostomy

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