



**ORIGINAL RESEARCH PAPER**

**surgery**

**A CLINICO PATHOLOGICAL STUDY ON GASTRIC OUTLET OBSTRUCTION AMONG PATIENTS IN SOUTHERN PART OF ODISHA**

**KEY WORDS:** gastric outlet obstruction, carcinoma stomach, pyloric stenosis.

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**ABSTRACT**

**INTRODUCTION:-** Gastric outlet obstruction is clinical and pathological consequence of any disease process that produce a mechanical impediment to gastric emptying. The process may be due to intrinsic or extrinsic factors. Term pyloric stenosis though commonly used term to describe the condition but is obscure as point of obstruction is very rarely at pylorus. With increased awareness of the disease, change in dietary habits and availability of drugs like H2 receptor blockers and proton pump inhibitors the incidence of peptic ulcer and gastric outlet obstruction is decreasing. **METHODS:-** A prospective study is conducted in Department of surgery, M.K.C.G Medical College and Hospital, Brahampur for a time period from August 2016 – July 2018. **OBSERVATION:-** Most cases of GOO present in the 5th decade of life followed by 6th decade. Both malignant and benign etiologies were high in the age group. Out of 60 cases studied 42 cases are males and 18 cases are females with male to female ratio approximately 3:1. Vomiting and epigastric pain are the most common symptoms in the study. Vomiting is spontaneous, projectile in nature, non bilious among cases of cicatrizing ulcer and Ca stomach. Visible gastric peristalsis is seen in 38 cses accounting to 64% of total study population. Dehydration is seen in 55% of cases. Anemia is found in 52% cases. Succession splash is heard in only 35% cases. A palpable mass is palpated in 25% cases. Truncal vagotomy and gastrojejunostomy is done in 21 cases of all duodenal ulcer cases. Distal gastrectomy with billroth-II reconstruction is done in 14 cases of carcinoma stomach. Rest cases of carcinoma stomach is managed by palliative operations. **CONCLUSION:-** The present study is an insight into the presentation of GOO and it's etiology. Commonest cause of GOO in adults is carcinoma stomach followed by cicatrizing duodenal ulcer. GOO is common in males in 5th decade.

**INTRODUCTION:**

According to Sir James Walton, GOO (gastric outlet obstruction) is described as:- " The stomach you can hear, the stomach you can feel and the stomach you can see"

Gastric outlet obstruction (GOO) is clinical and pathophysiological consequence of any disease process that produce a mechanical impediment to gastric emptying which may be intrinsic or extrinsic.<sup>(1)</sup>

The common causes of obstruction are pyloric stenosis secondary to peptic ulceration and gastric cancer, latter being commoner in recent years<sup>(2)</sup>. Gastric outlet obstruction occurs in approximately 2% of patients with chronic duodenal ulcer<sup>(3)</sup>. Others are gastric polyps, bezoars, ingestion of caustic substances and pancreatic pseudocyst.

From the standpoint of pathology, the term pyloric stenosis is usually inaccurate atleast in adult patients, since the site of obstruction is rarely situated at the pylorus itself; but is more often placed immediately proximal to the pylorus where the diagnosis of carcinoma is most probable or more distally in the duodenal bulb where the cause is almost invariably a duodenal ulcer.

But with increased awareness of the disease, change in dietary habits and availability of drugs like H2 receptor blockers and proton pump inhibitors and recent finding of the association of H-pylori with the causation of peptic ulcer diseases and its effective

irradiation with H-pylori kits, all have resulted in decreased incidence of patients requiring surgery and also the complications like pyloric stenosis have reduced.<sup>(4)</sup> 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 fibre optic endoscope.<sup>(5)</sup>

This study has been taken up to review the changes in presentation of gastric outlet obstruction in view of changing trends in the management because of new drugs and investigatory modalities. The lack of uniformity<sup>(6)</sup> 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 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 400 ml on saline load test.
- 8 Demonstration at operation or autopsy of grossly narrowed gastric outlet.

**REVIEW OF LITERATURE:-**

Surgery for benign GOO remains an important treatment modality

either as initial therapy or following unsuccessful pyloric dilation. Options for treatment include highly selective vagotomy with some form of pyloroplasty, truncal vagotomy with gastroenterostomy, or truncal vagotomy with antrectomy. All have been reported with good results.7-12

Nonoperative management includes pneumatic dilation with or without treatment directed at HP infection. In many instances, pneumatic dilation is used primarily, and frequently repeatedly, before consideration for surgical referral7-12.

Misra SP, Dwivedi M13 study revealed that balloon dilation of benign pyloric stenoses results in short-term symptomatic relief in the majority of patients. However, in the long run, about half of the patients can be expected to experience a recurrence of symptoms, requiring further surgical treatment.

Alam TA et al14 concluded that laparoscopic gastrojejunostomy provides effective palliation of gastric outlet obstruction.

Van Heek NT et al15 study Prophylactic gastrojejunostomy significantly decreases the incidence of gastric outlet obstruction without increasing complication rates.

**AIM AND OBJECTIVES:-**

- To identify the causes of Gastric Outlet Obstruction in the adult rural patients coming to M.K.C.G Medical college and hospital, berhampur.
- To evaluate diagnostic methods and management strategies of Gastric Outlet Obstruction in adults.
- To follow the surgery done for cases of GOO, and outcome following surgery.

**MATERIALS AND METHODS**

This prospective study is conducted in Department of surgery, M.K.C.G Medical College and Hospital, Brahampur.All consecutive patients from both the sex and all age groups, presenting with clinical features of Gastric outlet obstruction are studied, admitted to the General Surgery Department of M.K.C.G Medical College and Hospital, Berhmapur, during the period from August 2016 – July 2018.

**INCLUSION CRITERIA**

All patients admitted in M.K.C.G Medical college hospital, General Surgery department of both sexes with sign and symptoms of gastric outlet obstruction.

**EXCLUSION CRITERIA**

- Patients unwillingness.
- Patients age below 14 years.
- Pregnant female.

**OBSERVATION**

**Distribution of etiologies**

Out of 60 cases studied 30 were due to carcinoma stomach, 8 were due to other malignancies , 22 due to cicatrizing ulcer.

ETIOLOGY	NO OF CASES	PERCENTAGE
Ca stomach	30	50%
Cicatrizing Ulcer	22	37%
Periampullary Ca	5	8%
Ca head of Pancrease	2	3%
Cholangio carcinoma	1	2%
Total	60	100%

**Age distribution of GOO**

Most cases of GOO present in the 5th decade of life followed by 6th decade. Both malignant and benign etiologies were high in the age group.

AGE DISTRIBUTION	NUMBER	PERCENTAGE
14-20	2	3%

21-30	3	5%
31-40	6	10
41-50	8	13
51-60	24	40%
61-70	12	20%
71-80	5	8%

**SEX DISTRIBUTION IN GOO**

Out of 60 cases studied 42 cases are males and 18 cases are females with male to female ratio approximately 3:1. With regards to individual itologies carcinoma stomach male to female ratio is around 2:1, and chronic duodenal ulcers ration being 4:1.

SEX	NUMBER	Ca STOMACH	DU	OTHERS
MALE	42(70%)	20(67%)	18(81%)	4(50%)
FEMALE	18(30%)	10(33%)	4(19%)	4(50%)

**SYMPTOMS IN GOO**

SYMPTOMS	NUMBER	PERCENTAGE
VOMITING	60	100%
PAIN	48	80%
ANOREXIA	33	55%
WEIGHT LOSS	36	60%
HEMATEMESIS	18	30%
MALENA	13	22%
JAUNDICE	8	14%

Vomiting and epigastric pain are the most common symptoms in the study. Vomiting is spontaneous, projectile in nature, non bilious among cases of cicatrizing ulcer and Ca stomach. Billious vomiting is seen in cases of peri ampullary carcinoma or carcinoma head of pancreas. The most common clinical pictures in GOO are vomiting, epigastric pain, abdominal distension and weight loss.

Other symptoms include anorexia , weightloss hematemesis, malena.

**Signs in GOO:-**

SIGNS	NUMBER	PERCENTAGE
V.G.P	38	64%
Palor	31	52%
Dehydration	32	55%
Succussion splash	22	35%
Palpable mass	15	25%
Ascites	9	15%

Visible gastric peristalsis is seen in 38 cses accounting to 64% of total study population. Dehydration is seen in 55% of cases. Anemia is found in 52% cases. Succussion splash is heard in only 35% cases. A palpable mass is palpated in 25% cases. Ascites is found in 15% cases.

**DYSELECTROLYTEMIA**

CAUSES NUMBER OF CASES PERCENTAGE  
 BENIGN 16 71 %  
 MALIGNANT 18 47 %

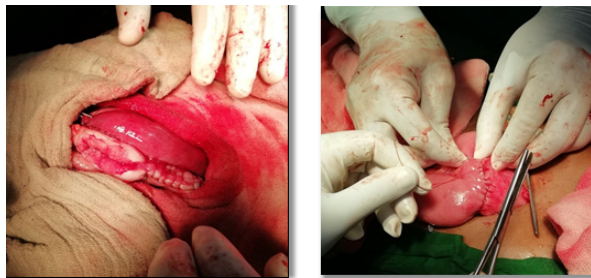
Considering sodium, potassium and chloride level in blood the patients were categorised as having electrolytes imbalance or not. It was found that 16 out of 38 cases (47%) of malignant causes of gastric outlet obstruction showed electrolyte imbalance in blood reports, where as in benign cause it was seen among 16 patients out of 22 mounting to 71% .

**SURGICAL PROCEDURE**

PROCEDURE	Ca Stomach	Duodenal Ulcer	Others
GJ+TV	0	21	0
DG+B-II	14	0	0
Total Gastrectomy	1	0	0

Palliative GJ	10	0	0
Feeding jejunostomy	5	1	0
Palliative GJ+HJ	0	0	7
Palliative CJ+GJ	0	0	1

Truncal vagotomy and gastrojejunostomy is done in 21 cases of all duodenal ulcer cases. Distal gastrectomy with billroth-II reconstruction is done in 14 cases of carcinoma stomach. Rest cases of carcinoma stomach is managed by palliative gastro jejunostomy in 10 cases , feeding jejunostomy in 5 cases and total gastrectomy was possible in only 1 case. Palliative gastrojejunostomy and hepaticojejunostoy done in 7 cases and palliative g astrojejunostomy and cholecystojejunostomy done in 1 case.



**Intra operative pictures of distal gastrectomy with gastrojejunostomy**

**DISCUSSION AND ANALYSIS**

The discussion is mainly on observation made from presenting symptoms, signs, investigations, surgery performed and follow up of GOO cases attending Department of General Surgery M.K.C.G Medical College an Hospital for a period of two years.

GOO secondary to Ca Stomach	30(50%)
GOO secondary to peptic ulcer	22(37%)
GOO secondary to periampullary Ca	5(8%)
GOO secondary to Ca Head of Pancreas	2(3%)
GOO secondary to Cholangiocarcinoma	1(2%)

The commonest cause of GOO is malignancy which is seen in 38 cases (63%) of which 30(50%) are due to carcinoma stomach and rest 8(13%) due to other malignancies and second most common cause being cicatrizing duodenal ulcers seen in 22 cases (37%).

Previously Duodenal ulcer was the most common cause of GOO. These observations shows increase in carcinoma related GOO and reduction in peptic ulcer related GOO. These findings correlate with Derek Frederickson et al<sup>58</sup> and Mc- Quaid et al study (2010)<sup>16</sup> which says malignancy accounts in 50-80% cases and 61% in Dallas N shone et al study (2008)<sup>17</sup> and 72.9% according to study by S.Essoun, J.C.B. Dakubo<sup>18</sup>. With regards to individual incidences carcinoma stomach is the most common malignancy with 50% in present study and is comparable to 42.9% as per JAKA et al<sup>62</sup> and 55% as per S.Essoun, J.C.B. Dakubo<sup>18</sup>. Cicatrizing ulcer in duodenum is the most common benign condition seen in 37% in present study and comparable to 28.3 % to JAKA et al and 25% as per S.Essoun, J.C.B. Dakubo .

ETIOLOGY	PRESENT STUDY	JAKA et al	ESSOUN & DABUKO	RANKA KSHITIZ et al
	%	%	%	%
CA STOMACH	50	42.9	55	59
CDU	37	28.3	25	22.5
OTHERS	13	28.8	13.8	18.5

**INCIDENCE OF ETIOLOGIES IN VARIOUS STUDIES**

In this study majority of the patients were in 5th decade with mean age being 54 years. For malignancies mean age is found to be 58 and for benign diseases mean age is 47.5 years with a standard deviation of 12.8 which is comparable to JAKA et al<sup>19</sup> where the mean age for GOO is 52 years and mean age for GOO is 52 years

and mean age for chronic duodenal ulcers is 34 years and malignant GOO is 56 years.

In carcinoma stomach with GOO youngest age of presentation is 30 years and oldest being 73 years. Majority of cases were in age group 50-60 years. In duodenal ulcer maximum incidence is found in the 5th decade followed by 3rd decade. The youngest age of presentation is 18 years and oldest being 70 years with a mean age of 46 years which is comparable to FISHER et al<sup>20</sup> study where mean age is 54 years.

**AGE DISTRIBUTION IN VARIOUS STUDIES**

AGE DISTRIBUTION	PRESENT STUDY %	ESSOUN & DAKUBO %	RANKA KSHITIZ et al %	JAKA et al %
14-30	8	1.8	5	6
31-40	10	11.2	7.5	14.1
41-50	13	23.3	17.5	20.7
51-60	40	18.6	40	23.9
61-70	20	28.9	30	12
71-80	8	9.3	0	3.8

GOO is most common in males 70% and females 30% which is comparable to study by Essoun & Dakubo<sup>18</sup> in which 68.22% in males and 57.14% in females. With regards to individual etiologies incidence in males in ca stomach is 76.27% compared to 67% in present study and incidence of peptic ulcer in males is 42.8% when compared to 81% in present study.

In duodenal ulcer men outnumbered women by 4.2:1 while it is 2:1 in study by YOGIRAM & CHOWDHURY<sup>21</sup> and 1.2:1 in study conducted by JAKA et al. GOO is common in males (70%) than females (30%) in the present study which is similar to study conducted by JAKA et al<sup>19</sup>. This higher incidence in males, world wide can be explained as because of more consumption of gastric irritants by males compared to females<sup>22</sup>.

**SEX DISTRIBUTION IN GOO**

STUDIES	SEX	PERCENTAGE OF GOO	CA-STOMACH	DU
		%	%	%
PRESENT STUDY	MALE	70	67	81
	FEMALE	30	33	19
RANKA KSHITIZ ET	MALE	70	73	66
	FEMALE	30	27	33
JAKA ET AL	MALE	66.3	NA	NA
	FEMALE	33.7	NA	NA
ESSOUN & DAKUBO	MALE	68.22	NA	NA
	FEMALE	31.77	NA	NA

NA:- Data not available in the study.

**OCCUPATION:-**

30 patients were manual labourers and farmers and most of them belong to low socioeconomic status who gave history of irregular dietary habits. The DONALD D KOZOLL and KARL A MEYER<sup>23</sup> also showed the same pattern as in non skilled day labourers.

38 patients have history of tobacco consumption in form of smoking and chewing and alcohol intake

Vomiting(100%) and epigastric pain (80%) are the most common symptoms in this series which is compared to 100% and %^% in study by JAKA et al. KEITH A KELLY<sup>24</sup>in his study series reported vomiting and weightloss in 54% of patients compared to 60% in present study and upper gastrointestinal bleeding in 34% which is 30% in present study.

Vomiting being spontaneous, projectile and non bilious seen in all patients of cicatrizing ulcer and ca stomach. Bilious vomiting found in GOO due to periampullary ca and ca head of pancreas. Most of them complain of nausea and post prandial epigastric fullness.

Other symptoms include anorexia(55%) and weight loss(60%) which is comparable to 52% in study by MICHAEL L SCHWARTZ<sup>25</sup>. Weight loss can be seen in 59.55% of patients in the series of Donald D. Kozzol and Karl A.Meyer<sup>23</sup> and 32% in the series of Harvey J Dworken and Harol P. Roth<sup>26</sup> and 93% in the study of JAKA et al. Most of the patients are malnourished in spite of good appetite due to increased abdominal pain on food intake.

**DISTRIBUTION OF SYMPTOMS IN GOO**

SYMPTOMS	PRESENT STUDY	RANKA KSHITIZ ET AL	JAKA ET AL
	%	%	%
VOMITING	100	100	100
PAIN	80	89	56
ANOREXIA	55	84	
WEIGHT LOSS	60	84	93
HAEMATEMESIS	30		
MALENA	22	35	

1 case was previously operated for duodenal perforation. 10 out of 22 cases gave positive history of previous acid peptic disease and used proton pump inhibitors as over counter medication. None out of 22 cases had taken anti helicobacter pylori treatment.

Pain , vomiting bile stained, progressive jaundice , itching, anorexia and weight loss are commonly found in periampullary carcinoma. Symptoms of GOO , such as nausea vomiting are reported in 11% to 50% of patients with pancreatic cancer at the time of Diagnosis (DiMagno et al,1999).

Jaundice is noted in 1 case of ca stomach and not found in duodenal ulcer probable cause being periportal nodes compressing CBD or infiltration.

Palor was present in 71% Ca stomach and 25% duodenal ulcer which is comparable to 62% in ca stomach in MICHAEL.L SCHWARTZ et al and 80% of cases in study by JAKA et al. Dehydration is seen 55% of case similar to study JAKA et al.

Visible gastric peristalsis (VGP) is seen in 64% of cases GOO of which 75% cases of duodenal ulcer and 60% of cases of ca stomach compared to YOGIRAM and CHOWDHARY seen in 74%of duodenal ulcer.

Succussion splash is seen in 35% of cases in present study which is observed in 64% cases of GOO in study by HAROLD ELLIS and 78.3% cases in study conducted by JAKA et al.

VGP and succussion splash was seen in less commonly in Ca stomach than Duodenal ulcer corresponding to observation made by Harold ellis. Electrolyte disturbances seen in 10 cases (17%) when compared to MICHAEL.L SCHWARTZ et al it is 30% and 57.6% in study by JAKA et al.

Palpable mass is found in 15 cases (25%) of GOO comparable to 25 % in study by JAKA et al.

**DISTRIBUTION OF SIGNS**

SIGNS	PRESENT STUDY	JAKA ET AL
	%	%
VGP	64	
PALOR	52	80
DEHYDRATION	55	54.9
SUCCUSSION SPLASH	35	78.3
PALPABLE MASS	25	25

In present study all cases of cicatrizing duodenal ulcer underwent truncal vagotomy with posterior retrocolic loop gastrojejunostomy except 1 patient who underwent feeding jejunostomy due to his poor condition to be fit for general anesthesia.

In ca stomach cases 14 cases underwent billroth II procedure, 10

cases underwent palliative anterior gastrojejunostomy and 5 cases has to under go feeding jujunostomy because of advance nature of the disease. Only one case a total gastrectomy was performed as tumor was seen extending on to lesser curvature and tumor free margin was not attainable by distal gastrectomy only. The most common procedure performed is gastrojejunostomy in 31 cases (54%) which is 61.9% in study by JAKA et al.

All 8 cases presented with periampullary carcinoma and carcinoma head of pancreas presenting as GOO were inoperable, 7 cases underwent palliative hepatico-jejunostomy and gastro-jejunostomy. One case of periampullary carcinoma underwent cholecysto jejunostomy and palliative gastrojejunostomy. Gastro juejunostomy should be performed in every case in addition to billiary bypass in patients with unresectable periampullary adenocarcinoma<sup>27</sup>. The presence of GOO is not an independent factor of poor prognosis, but a reflection of the aggressive biologic behaviour of pancreatic head adenocarcinoma.

**DYSELECTROLYTEMIA IN GOO**

CAUSES PRESENT STUDY M.S.SUSHRUTA etal P.VANATHI BENIGN 71% 61.1% 67% MALIGNANT 47% 28.1% 40%

Electrolyte imbalance in GOO is due to loss of ions in the vomiting and subsequent remodifications. It is more commonly found in benign causes of GOO due to its long history of vomiting. In present study it was found in 71% of cases of cicatrizing duodenal ulcer cases. It is comparable with study by **M.S.SUSHRUTA<sup>28</sup> et al** which shows 61.1 % and by **Dr. P.VANATHI<sup>29</sup>** whose study showed it in 67%. Dyselectrolytemia is less commonly found in malignant causes but it was found in the present study that 47% showed electrolyte imbalance which is comparable with study by **Dr. P.VANATHI** showing it in 40% but differ from study by **M.S.SUSHRUTA et al** having 28% imbalance in malignant GOO. The higher incidence in present study can be explained due to late presentation and lack of awareness among the population which is largely poor in this region .

**SURGICAL PROCEDURE IN GOO**

PROCEDURE	PRESENT STUDY	RANKA KSHITIZ ET AL	ESSOUN & DABUKO
	%	%	%
GJ+TV	35	12	25
DG+B-II	31	38	13
TOTAL GASTRECTOMY	2	0	0
PALLIATIVE GJ	16	28	30
FEEDING JEJUNOSTOMY	10	10	0
PALLIATIVE GJ+HJ	12	0	0

Six cases of carcinoma stomach developed wound infection with discharge which was conservatively managed. No complication was found during 1 year follow up of gastrojejunostomy for duodenal ulcer. 1 case of Ca stomach presented with pain abdomen in post operative period and upper GI endoscopy found it to be GJ stomal ulcer.

One case of periampullary carcinoma developed bile leak, conservatively managed for 2 weeks which was subsided, 2 cases of Ca stomach and one case of cholangiocarcinoma died in early post-operative period. All cases of carcinoma stomach were referred to radiotherapy department for adjuvant chemotherapy treatment with inj 5FU and inj leucovorin for 3 cycles.

All cases of cicatrizing duodenal ulcer were discharged post operativelyafter 8-10 days and advised anti H Pylori regimen and proton pump inhibitors.

**FOLLOW UP :-**

All cases of peptic ulcer followed postoperatively till date showed no complications. 3 cases of periampullary and 4 cases of ca



stomach died within 1 month of surgery before receiving adjuvant treatment. 7 cases of carcinoma stomach died within 6 months of follow up. Remaining cases were receiving chemotherapy.

**SUMMARY**

Most common cause of Gastric Outlet obstruction is malignancy i.e 63% of which Ca stomach is 50%. Periampullary carcinoma 8%, carcinoma head of pancreas 3%, cholangio carcinoma 2%. Most common benign cause is duodenal ulcer 37%. Males are more commonly affected M:F = 3:1. Most common presenting symptoms are vomiting and pain abdomen and signs being anemia dehydration and visible gastric peristalsis. Smoking and alcohol are associated with Carcinoma Stomach. VGP and succession splash is more seen in case of benign disease than malignant. 15 cases presented with a mass per abdomen, presence of mass favours the malignancy. electrolyte imbalance in malignant cases is higher compared to other studies due to lack of awareness. 15 cases of Ca stomach were operable and operated at time of presentation, other cases were inoperable underwent any palliative measures. The surgical procedure done in all cicatrizing duodenal ulcer patients is truncal vagotomy and gastrojejunostomy and there is no recurrence symptoms in any cases. Periampullary carcinoma and ca pancreas developing GOO is inoperable case and so underwent palliative treatment and they have poor prognosis.

**CONCLUSION**

The present study is an insight into the presentation of GOO and it's etiology. Commonest cause of GOO in adults is carcinoma stomach followed by cicatrizing duodenal ulcer. GOO is common in males in 5th decade. UGI endoscopy is investigation of choice. Malignant GOO had poor prognosis and mostly palliation is done. It focuses on the fact that there is delayed presentation with patients with upper gastro intestinal malignancy. UGIE can be proposed as screening modality to identify the condition at an early stage.

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