

Managements of Patients with Malignant Gastric Outlet Obstruction: Prospective Study

Laith. R. Alhadad*, Ali Hussein Jasim**, Wail Sabah Al-Saffar. ***

ABSTRACT :

BACKGROUND:

Gastric outlet obstruction is the clinical and pathophysiological consequence of any disease process that produces a mechanical impediment to gastric emptying. It classified into benign and malignant group. Distal gastric cancer form 35% of cases with malignant gastric outlet obstruction.

OBJECTIVE :

To study the causes of malignant gastric obstruction and how to treat them, in addition the application of gastric outlet obstruction score in our patient pre- and post-treatment.

PATIENT AND METHODS:

Between January-2012 to January-2014, a prospective study involves all patients with malignant gastric outlet obstruction in the surgical department in the gastrointestinal and Hepatology teaching hospital.

RESULTS:

A total of 51 cases of malignant gastric outlet obstruction were enrolled in the research, with mean age 53.21 ± 14.6 years. There were 30 male patients (58.8%) with male to female ratio = 1.4:1. Non-bilious vomiting was present in (100%) of cases. antropylic region was found in (47.1%) patients. Regarding GOOS, there were improvement in all patients (p value = 0.048). Distal gastrectomy done in 19.6% of patients and gastrojejunostomy performed in 80.3% of patients. Gastric adenocarcinoma found in 15.7%, in 47.05% of patients was found to have metastatic adenocarcinoma.

CONCLUSION:

Gastric outlet obstruction poses diagnostic and therapeutic challenges to general surgeons. In recent years malignant cause become more. Gastric outlet obstruction score has a role in management of patients. Distal gastrectomy is the treatment of choice in resectable cases, while gastrojejunostomy can be used in advanced cases.

KEYWORDS: malignant gastric outlet obstruction, gastric outlet obstruction scoring system, gastrojejunostomy.

INTRODUCTION:

Gastric outlet obstruction (GOO, also known as pyloric obstruction) is the clinical and pathophysiological consequence of any disease process that produces a mechanical impediment to gastric emptying ⁽¹⁾. GOO is categorized into benign and malignant ⁽²⁾. The incidence of gastric outlet obstruction has been reported to be less than 5% in patients with peptic ulcer disease, while distal gastric cancer accounting for up to 35 % and peripancreatic malignancy, has been reported as 15-

20 % ^(3,4,5). Other causes are gastric lymphoma, neoplasm of the duodenum and ampulla, locally advanced gallbladder carcinoma or cholangiocarcinoma, gastric carcinoid ^(6,7). Nausea and non-billions vomiting are the cardinal symptoms of gastric outlet obstruction. Weight loss can be seen in patients with malignant causes ⁽⁸⁾. A succession splash should be elicited if GOO is suspected and a left supraclavicular lymph node or periumbilical lymph node may be seen in metastatic gastric cancer ⁽⁹⁾. The diagnosis is established by Radiologic testing and endoscopic evaluation ⁽¹⁰⁾. Hypokalemia hypochloremic metabolic alkalosis is the main metabolic changes

*Consultant Surgeon. Head of Surgical Department of Gastrointestinal and Hepatology Teaching Hospital

**General Surgeon in GIT Hospital.

***Genral Surgeon GIT Hospital.

occurs ⁽¹¹⁾. Additional evaluation includes endoscopic biopsies, endoscopic ultrasound and nuclear gastric emptying studies ⁽¹²⁾. A Gastric

Outlet Obstruction Scoring System (GOOSS) was constructed to objectively assess patients' level of oral intake, Table (1).

Table 1: Gastric outlet obstruction scoring system

Level of oral intake	score
No oral intake	0
Liquids only	1
Soft solids	2
Low-residue or full diet	3

Initial management GOO should be made nothing per os, receive adequate fluid and electrolyte replacement, and have a nasogastric tube placed for gastric decompression ⁽¹³⁾. Definitive treatment include surgical bypass through a gastrojejunostomy or placement of an endoscopic enteral stent ⁽¹⁴⁾. Metallic stenting can be done simultaneously for both pyloric or duodenal, and biliary obstruction at the same time ⁽¹⁵⁾. Other nonsurgical modalities, such as balloon dilation, laser ablation, radiotherapy, and feeding tubes, produced only a transient improvement in obstructive symptoms ⁽¹⁶⁾.

PATIENT AND METHODS:

Between January-2012 to January-2014, a prospective study involves all patients with malignant gastric outlet obstruction in the surgical department of the gastrointestinal and Hepatology teaching hospital, Baghdad medical city. The diagnosis of gastric outlet obstruction was based on clinical presentation, an upper gastrointestinal barium study, and/or an inability during upper endoscopy to intubate the duodenum and on histology results. The patients with benign causes are excluded from the study depending on biopsy. Any patient who had distal gastric mass, duodenal mass, biliary and pancreatic mass without any endoscopic or radiological evidence of obstruction were excluded from the study. Preoperatively, all the patients had intravenous fluids administration; nasogastric suction; urethral catheterization and broad-spectrum antibiotic coverage. Relevant preoperative laboratory investigations were done. Imaging includes plain abdominal x-rays, barium studies, abdominal ultrasound and abdominal computerized tomography scan and (MRI & MRCP MRCP= Magnetic resonance cholangiopancreatography) in some cases. A preoperative GOO score was calculated to each patient. Surgery done under general anesthesia and patients subjected to exploratory laparotomy. The diagnosis confirmed intraoperatively. The type of

surgical procedure was done accordingly. Biopsy was taken from obstructing lesion or from the metastatic lesion by (fine needle aspiration cytology FNAC) or tissue biopsy, or sometimes specimens after resection, for histological examination. The postoperative outcome was monitored. Calculation of the postoperative GOO scores to each patient was done at 7th postoperative day. The patients were followed up in the short postoperative period until discharge, and then followed subsequently during their visit to the outpatient clinic in our hospital. We define minor postoperative complication as that does not require hospital admission, and major complication those require invasive procedures and hospital admission ⁽³⁶⁾. The statistical analysis was performed using statistical package for social sciences (SPSS) version 21.0 for Windows. The level of significance was considered as $P < 0.05$. The values for the patients' baseline characteristics are expressed as the mean $\pm$ standard deviation.

RESULTS:

Patients Characteristics

During the study period (January-2012 to January-2014), a total of 51 cases of malignant gastric outlet obstruction were enrolled in the research. The age of the patients at presentation ranged from 14 – 75 years, mean age 53.21 ± 14.6 years. 9 (17.6%) of our cases in the (41-50) age rang had obstruction at the antropylic region, which was the most frequent group **Table (2)**. There were 30 male patients (58.8%) and 21 female patients (41.2%), with male to female ratio = 1.4:1, . Most of our patients are from rural areas 30 patients (58.8%). 23 patients (45%) had governmental or private sector job, the rest 28 (41.17%) were either retired or have no work. All 51 patients had plain abdominal x-ray, the gastric air fluid level, seen only in (47%) patients. Barium meal done in (52.9%) patients, and dilated stomach and pyloroduodenal stenosis was demonstrated in (92%). Upper gastrointestinal endoscopy was performed in

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all our patients, endoscopic biopsy done in all patients and was conclusive in (58.8%).

The duration of symptoms ranging from 3 weeks to 7 months, with mean about 16weeks. The most common presentation in our patients was non-bilious vomiting, followed by epigastric pain,

weight loss. Weight loss was assessed by history and clinical examination, and weighing of the patients. Past surgical history was present in 13 patients (25.5%), and in 45 patients (88.2%) there was positive past medical history.

Table 2: Show the relation between Age and Cause of obstruction.

		Age Range							Total
		10-20	21-30	31-40	41-50	51-60	61-70	71-80	
Cause Of Obstruction	Antropyloric(gastric) mass	0	4	1	9	2	5	3	24
	Duodenal mass	0	0	1	1	3	3	1	9
	Pancreatic mass	1	0	0	2	3	0	0	6
	Ampullary mass	0	0	0	0	3	2	0	5
	Recurrent Gastric mass	0	0	1	1	1	0	0	3
	Duodenal & colonic mass	0	0	0	1	0	2	0	3
	Gall Bladder mass	0	0	0	0	1	0	0	1
Total		1	4	3	14	12	12	5	51

The most common site was mass at the antropyloric region in 24 (47.1%) patients. There were 3 (5.9%) patients had transvers colon tumor invading the pylorus and duodenum or the revers because histology did not confirm tissue of origin, Table (3). Preoperative Gastric outlet obstruction (GOOS) score was calculated to all our patients, we defined

clinical success as increase in the score 1 point and/or improvement in symptoms 7 days after surgery. Before surgery (39.2%) of patients had grade 0 score and (60.8%) had grade 1 score. Postoperatively (27.5%) of patients had score 2, and (72.5%) had score 3 (p value =0.048) which was significant. As shown in tables (4, 5).

Table 3: Shows the frequency of causes of obstruction.

Site of Obstruction	Frequency	Percent
Antropyloric (gastric) mass	24	47.1%
Duodenal mass	9	17.6%
Pancreatic mass	6	11.8%
Ampullary mass	5	9.8%
Recurrent Gastric mass	3	5.9%
Duodenal & Colic mass	3	5.9%
Gall bladder mass	1	2.0%
Total	51	100.0%

Table 4: Shows the gastric outlet obstruction score preoperatively.

Gastric outlet Obstruction score	Frequency	%
0	20	39.2%
1	31	60.8%
2	0	0%
3	0	0%

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Table 5: Shows the gastric outlet obstruction score postoperatively.

Gastric outlet Obstruction score	Frequency	%
0	0%	0%
1	0%	0%
2	14	27.5%
3	37	72.5%

Treatment modality: (19.6%) patients were amenable to surgical resection, and (80.3%) patients found to have unresectable tumors. These results are shown in Table (6). Loop Gastrojejunostomy alone was the most common

surgical procedure (37.2%) of patients. A (3.9%) of patients had ovarian solid masses, and treated by gastrojejunostomy and bilateral oophorectomy, Table (7).

Table 6: Shows tumor resectability status.

Resectability		No.	%
Resectable		10	19.6%
Unresectable	Locally Advanced	15	29.4%
	Metast. Peritoneal	5	9.8%
	Metast. Omental	2	3.9%
	Metast. Liver	17	33.3%
	Metast. Ovary	2	3.9%
	Total	51	100.0%

Table 7: Shows type of surgery performed.

Type of surgery	No. of patients	Percent
Gastrojejunostomy	19	37.2%
Gastric & Biliary Bypass	14	27.5%
Distal Gastrectomy	10	19.6%
Re- Gastrojejunostomy	3	5.9%
Gastrojejunostomy & ileocolic Anastomosis	3	5.9%
GJ & Oophorectomy	2	3.9%
Total	51	100.0%

The overall length of hospital stay was ranging from 7 days to 23 days, with mean about 12.13 ± 3.96 days. There was no in hospital mortality recorded in our patients. (47.05%) patients found to have metastatic adenocarcinoma, Table (8). (33.3%) of our patients developed minor surgical

complications and major surgical complications developed in (58.8%) of patients. Follow up period was ranging from 2-4 months. (70.5%) of our patients lost during the follow up period, and only (29.5%) had regular follow up to our hospital. No mortality was recorded in our patients during the follow up period.

Histology	No. of Patients	Percent
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Table 8: Shows the results of our

Metastatic Adenocarcinoma	24	47.05%
Gastric Adenocarcinoma	8	15.7%
Pancreatic Adenocarcinoma	7	13.7%
Duodenal Adenocarcinoma	6	11.7%
Gastric lymphoma (NHL)	2	3.9%
Ampullary Adenocarcinoma	3	5.8%
Gallbladder Adenocarcinoma	1	2.0%
Total	51	100.0

Histopathology patient.

Table 9: The mean time to resume oral intake.

	No. of patients	Mean Days to resume oral intake	P value
S.M. Jeurnink et al ⁽²⁵⁾	42 patients	6 days	P = 0.38
Suzanne M. et al ⁽²⁶⁾	18 patients	5days	P = .01
Our study	51 patients	5 days	P = .048

DISCUSSION:

This study was conducted in our environment to describe our own experiences in the management of this challenging disease; the problem that not previously studied at our center. When the tumor was localized best treatment is surgical resection and if it was locally advanced or has peritoneal or systemic metastasis, bypass is the best option followed by adjuvant treatments ⁽³⁾. When GOO associated with obstructive jaundice; the treated was gastrojuenostomy and choledochojuenostomy. In our review, we found that 29 (56.8%) of our patients is above 50 years, and the incidence was high in the age range (41-50). This high incidence of malignancy in old age group also reported in other literatures ^(17, 18, 19). Although, we have one case of 14 year old female diagnosed with pancreatic adenocarcinoma that was found invading the major vessels and multiple peritoneal deposits. Most of our patients were male patients (58.8%) with 1.4:1 is the male to female ratio. This is consistent with reported in other literatures ^(18, 19). We found most of patients (58.8%) from rural areas and had low socioeconomic level. This observation has an implication on accessibility to health care facilities and awareness of the disease, which can explain why our patients had delayed presentation ^(17, 18, 20). This also associated with the time interval between presentation and

diagnosis, which was ranging from few weeks to several months, with mean about 16 weeks. This is may be due to delayed diagnosis or remote medical services in rural areas this was consistent in other literatures by Hyasinta et al ^(18, 19). Kotisso R et al report duration of presentation ranging from few months to 25 years, this because he include benign causes in his study. Non-bilious vomiting being common presentation in all our patients (100%), followed by epigastric pain (70%), weight loss (68.6%) of patients. This feature was observed in other studies ^(10,18,19). In agreement with other studies ^(17,18,19), the diagnosis of gastric outlet obstruction in this study was based on clinical presentation, an upper gastrointestinal barium study, and/or an inability during upper endoscopy to intubate the duodenum (upper gastrointestinal endoscopy) and confirmed by histology and intra-operative findings..The majority of our patients in this study had obstruction at gastroduodenal region (Antropyloric 47%, Duodenal 17.1%); this finding is consistent with what mentioned in other studies ^(10,18,19). The predominant causes of gastric outlet obstruction have changed substantively with the eradication of *Helicobacter pylori* and the use of proton pump inhibitors. Until the late 1970s, benign disease was responsible for the majority of cases of gastric outlet obstruction in adults, while

malignancy accounted for only 10 to 39 % of cases. By contrast, in recent decades, 50 to 80 % cases

have been attributable to malignancy ^(8, 16, 22). One of the outcomes of our study was the improvement of food intake after surgery. It was measured by the gastric outlet obstruction scoring system (GOOS) score, with 0=no oral intake, 1=liquid diet, 2 =soft diet, and 3=regular diet ^(23, 24). Based on these data, we define clinical success as relief of obstructive symptoms and/ or improvement of GOO by one point. In our study we have seen improvement in at least one point in all our patients with significant p value=0.048. The mean time to resume oral intake was 5 days. This was notified in other studies ^(25, 26). As shown in table (9)

The initial treatment of patients with GOO is to correct dehydration and electrolyte imbalance. After that the patient is prepared for definitive treatment. This includes endoscopic approach (endoscopic metallic stent insertion) or surgical approach, which can done either laproscopically or open method. The decision depends on patient condition and availability of expertise ^(21, 22). In current study gastrojuenostomy was considered the standard operative approach in palliation of patients with unresectable tumor in about (80%) of patients, as only procedure or combined with biliary bypass or colonic bypass. As shown in table (14) ^(10,17,18,13). A. Mittal et al report 38% rate of gastrojuenostomy with the advantages, for ES (Endoscopic stenting) compared with OGJ (Open gastrojuenostomy) and LGJ(Laparoscopic gastrojuenostomy) in the palliation of malignant pyloroduodenal obstruction ⁽²¹⁾. Endoscopic or laparoscopic approach was not popular in our study due lack of facility to perform such procedures. Other operative procedures like biliary bypass, ileocolic anastomosis, and oophorectomy was done accordingly. Jeurnink et al ⁽²⁵⁾ mention that jaundice caused by biliary obstruction reduces quality of life; therefore, biliary obstruction should be treated as soon as possible. No other study reports combination of gastrojuenostomy and ileocolic anastomosis to bypass colonic invasion, and oophorectomy during the management of malignant GOO.

The overall length of hospital stay was about 12.13 ± 3.96 days, with range from 7-23 days, in comparison with other studies ^(10,19,27), Hyasinta et al, report 14 days as overall hospital stay periods which is slightly more than our study ⁽¹⁸⁾. Early discharge occurred in smooth uncomplicated surgery, while prolonged hospital stay occurred in patients who developed postoperative complications ⁽²⁸⁾.

The patients that found to have unresectable mass during exploration, due to locally advance disease

or metastasis, a biopsy taken from these lesions a proved to be adenocarcinoma in (47.05%) patients. We found that gastric adenocarcinoma was a common cause of malignant GOO followed by pancreatic adenocarcinoma. This was consistent with other studies which mention that gastric cancer is most common cause of malignant GOO ^(18,19,21,29,30). In contrast Jeanin E. van hooft et al ⁽¹⁰⁾ reports pancreatic cancer was the most common cause of malignant GOO in his study.

There is great variation in the prevalence of post-operative complications in literatures, some report wound infection and delayed gastric emptying are common complication ^(18, 19). We report postoperative pyrexia (17.6%) as common minor complication which may be related surgical stress, wound infection or chest infection and delayed gastric emptying as common major complication in our patients (21.6%), this is due nature of disease and duration of symptoms of gastric obstruction, the longer duration the obstruction the slow recovery of gastric function postoperatively ^(31,32). We also report 3 cases (5.88%) that develop DVT, which is one of the postoperative morbidity in patient with visceral malignancy ⁽³²⁾. All patients with DVT was treated conservatively with medical treatment and discharged on warfarin treatment. There is short follow up periods, and similarly only 15 (29.4%) of patients had follow up records. This also reported in other studies ^(18, 19). Poor follow up visits after discharge from hospitals remain a cause for concern. These issues are often the results of poverty, long distance from the hospitals and ignorance, and needs to be addressed ⁽³³⁾.

CONCLUSION:

Gastric outlet obstruction poses diagnostic and therapeutic challenges to general surgeons and contributes significantly to high morbidity and mortality. Most our patients in the middle age group with mean age 53.21 ±14.6 years, one case of 14 year old female diagnosed with pancreatic adenocarcinoma. Male are more about 58.8%, with male to female ratio = 1.4:1. Antropylic malignancy is the most common of GOO in 47.1%. Most patients are low socio-economic status, and from rural areas about (58.8%). Non-bilious vomiting is present in (100%) of cases, followed by epigastric pain (70%), weight loss (68.6%) of patients. Endoscopy and biopsy is the helpful to confirm diagnosis. Applying Gastric Outlet Obstruction Score (GOOS) is important in pre- and post-operative assessment; we have improvement

in GOOS in all our patients. Most our patients presented late in the course of disease. Distal

gastrectomy is the treatment of choice for resectable tumor, while loop gastrojejunostomy and other types of bypass surgery for unresectable tumor.

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