

## Role of laparoscope in Staging and Palliation of upper Gastro-Intestinal Malignancies

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### ABSTRACT

**Background:** Staging laparoscopy (SL) has a very significant role in upper GIT malignancies. It is very accurate in assessing peritoneal seeding, hepatic metastases which are not found on imaging modalities. A short SL performed just before the planned surgical procedure to certify the operability is found to be safe & very effective and need not be performed as a separate procedure. But short SL is less sensitive in staging compared to extended SL and use of LUS.

**Aim of the work:** is to discuss the role of laparoscope in Proper staging of upper gastro-intestinal malignancies; (lower esophagus, gastric, duodenal malignancies) and Possible palliation in advanced cases of Gastric outlet obstruction.

**Patients and methods:** This prospective randomized study was carried out at the Department of General Surgery, Al-Azhar University Hospitals, Cairo, Egypt. It included 20 adult patients with pathologically confirmed either lower esophageal, gastric or peripancreatic malignancies.

**Results:** Total results involved 20 patients of upper GIT cancer presented to the out-patient clinic of General Surgery Department Al-Azhar University Hospitals showed that from 20 patient were thought to be all operable only 15 (75%) were found to be operable and the rest 5 cases (25%) were found to be not. There were 3 (15%) cases of lower esophageal malignancies two(10%) of them were resectable and the another (5%) was not. There were 15 (75%) cases of Stomach malignancies out of which 3 (15%) cases were unresectable. Out of two cases of duodenal malignancies only 1(5%) was found to be unresectable.

**Conclusion:** Stagin Laparoscopy helped in a significant number of patients with advanced GI cancers to avoid laparotomy. The morbidity of DL was acceptable.

**Keywords:** Diagnostic laparoscopy; gastrointestinal cancer; operability; staging.

### INTRODUCTION

Surgical resection of upper gastro-intestinal malignancies, including lower esophageal, gastric, duodenal cancers, carries significant morbidity and mortality. Accurate preoperative staging of cancer has become essential for optimal patient care.<sup>1</sup> traditionally, patients were subjected to open exploration often for staging purposes. After staging laparoscopy, exploratory laparotomy for cancer staging has become undesirable as it lead to increased morbidity and mortality.<sup>2</sup>

Diagnostic laparoscopy is not a new modality. A Russian gynaecologist Dimitri Ott, is credited with the first recorded human laparoscopic examination in 1901.<sup>1</sup>

Many patients with abdominal malignancies are found at exploration to be unable to undergo resection. Laparoscopy has been suggested as a sensitive method for detecting metastatic disease.<sup>3</sup>

The potential to prevent a non-therapeutic laparotomy by means of accurate and less invasive

staging is the driving force behind laparoscopic staging. Diagnostic laparoscopy could prevent unnecessary laparotomies for exploration or palliation.<sup>4</sup> Additional laparoscopic ultrasonography was helpful to detect small intra hepatic metastasis and local ingrowth in vascular structures surrounding the tumor. Reported complication are rare and include bleeding, infection, visceral injury, bile leaks particularly if liver biopsy is performed and anaesthesia related complications.<sup>1</sup>

Despite improvements in therapeutic resection techniques, 60-70% patients with gastric cancer who have undergone a radical curative resection, experience recurrence within two years after surgery. It is thought that this is due to micro metastases that could not be diagnosed at the time of surgery. Therefore development of diagnostic technology that provides accurate staging diagnosis is urgently needed.<sup>3</sup> Malignant disease of upper gastro-intestinal tract is common and often diagnosed at a point when the opportunity for curative surgical resection has passed. Because of their involvement of luminal structures, obstructive symptoms from disruption to the flow of gut content or biliary tract secretions are

frequent. As such, palliative procedures aim to improve quality of life and short term survival when such complication occurs.<sup>5</sup>

Laparoscopy establishes a diagnosis, can be therapeutic, and cause less morbidity and mortality than a formal laparotomy. Over the last 20 years, options for palliation of upper gastro-intestinal tract malignancies have increased. Whereas previously open surgery, endoscopic, interventional radiological and laparoscopic surgical techniques have become common place.<sup>6</sup> Laparoscopic placement of feeding tube can also be performed at the same setting as staging laparoscopy, which can improve nutritional status of these patients and prevent the need for additional procedures.<sup>6</sup>

Main advantages of laparoscopy over laparotomy include avoidance of large incision, undue tissue handling and retraction which contribute to well-being of the patient, even though the local peritoneal inflammatory response is reduced, the systemic immunity is better preserved in laparoscopy surgery.<sup>5</sup> In some patients, palliative procedures such as laparoscopic gastric bypass for gastric outlet obstruction and laparoscopic celiac plexus block to treat severe pain from upper abdominal malignancies can be performed.<sup>4</sup>

#### PATIENTS AND METHODS

This prospective randomized study was carried out at the Department of General Surgery, Al-Azhar University Hospitals, Egypt. It included 20 adult

patients with pathologically confirmed either lower esophageal, gastric or peripancreatic malignancies. All patients were subjected to complete evaluation through detailed history, complete physical examination, Approval of the ethical committee and a written informed consent from all the subjects were obtained, pre and post diagnostic laparoscopy and surgical intervention were collected and analysed. Patient demographics, clinical presentation, surgery, histopathology, postoperative course, and oncological outcomes were also reviewed and analysed.

**Inclusion criteria:** Patients with no contraindications for laparoscopy, no sepsis or active general infection, stage I, II, and III lower esophageal, gastric and peripancreatic carcinomas (for correct staging), cases with stage IV (for appropriate staging and probable palliation).

**Exclusion criteria:** Patients who were unfit for surgery, or patients rejecting diagnostic laparoscopy, were excluded from the study. Patients with stage IV disease not pliable for palliation (not complaining of pain or appearance of gastric outlet obstruction) were also excluded, since there would be no symptoms we would be able to palliate.

#### STATISTICAL METHODS

The collected data was analyzed and tabulated using suitable statistical tests. The Statistical correlations and significant relations was highlighted and demonstrated in diagrammatic forms.

#### RESULTS

Total results involved 20 patients of upper GIT cancer presented to the out-patient clinic of General Surgery Department Al-Azhar University Hospitals showed that from 20 patient were thought to be all operable only 15 (75%) were found to be operable and the rest 5 cases (25%) were found to be not .

Frequency distribution for sex was as follows: 15 male (75%) and 5 female (25%). The age ranged from 40 to 70 years, with mean patient age was 55.7  $\pm$  7.98 years and BMI was 32.79  $\pm$  3.89.

No. of patients	
Mean age	55.7 $\pm$ 7.98
Mean BMI	32.79 $\pm$ 3.89
HTN	3 (15%)
DM	2 (10%)
SMOKERS	3 (15%)

Table (1) The base line characteristics.

Tumour site	No. of Patients	Percent
Lower Esophagus	3	15 %
Stomach	15	75 %
Duodenal	2	10 %

Table (2): DISTRIBUTION OF CASES ACCORDING TO TUMOUR SITE.

	Tumour Site			Total
	Lower Esophagus	Stomach	Duodenum	
Resectable	2 (10 %)	12 (60%)	1 (5 %)	15 (75 %)
Unresectable	1 (5%)	3 (20%)	1 (5 %)	5 (25 %)
<b>Total</b>	3	15	2	20

Table (3): RESECTABILITY ACCORDING TO THE TUMOUR SITE

		Site			Total	
		Lower Esophagus	Stomach	Duodenum		
<b>Lymph</b>	N0	Count	0	1	0	1
		% Site	0 %	5 %	0 %	5%
	N1	Count	2	8	1	11
		% Site	10 %	40.0%	5 %	55.0%
	N2	Count	1	6	1	8
		% Site	5 %	30 %	5 %	40 %
<b>Total</b>	Count	3	15	2	20	
	% Site	15 %	75 %	10 %	100.0%	

Table (4): LYMPH NODE STATUS ON STAGING LAPAROSCOPY

		Site			Total	
		Lower	Stomach	Duodenum		
<b>Peritoneal Nodules</b>	<b>Negative</b>	Count	2	13	1	16
		% within Site	10 %	65 %	5 %	80 %
	<b>Positive</b>	Count	1	2	1	4
		% within Site	5 %	10 %	5 %	20 %
	<b>Total</b>	Count	3	15	2	20
		% within Site	15 %	75 %	10 %	100.0%

Table (5): PERITONEAL NODULES ON STAGING LAPAROSCOPY

		Site			Total	
		Lower Esophagus	Stomach	Duodenum		
<b>Liver</b>	<b>Negative</b>	Count	2	12	1	15
		% Within Site	10 %	60 %	5 %	75 %
	<b>Positive</b>	Count	1	3	1	5
		% Within Site	5 %	15 %	5 %	25%
	<b>Total</b>	Count	3	15	2	20
		% Within Site	15 %	75 %	10 %	100%

Table (6): Liver Metastases on Staging Laparoscopy

Procedure	Laparscopic Stage		Total	Percent
	Resectable	Unresectable		
<b>Definitive</b>	15 (75%)	0 (0%)	15	75%
<b>Palliative</b>	0 (0%)	1 (5%)	1	5%
<b>Biopsy</b>	0 (0%)	4 (20%)	4	20%
<b>Total</b>	15 (75%)	5 (25%)	20	100%

Table (7): TYPE OF SURGERY PERFORMED

## DISCUSSION

In our study 20 cases of upper GIT malignancies admitted in AL-AZHAR University Hospitals during the study period.

Diagnostic laparoscopy was performed in each patient immediately before the planned elective surgery. It resulted in change in further course of management of significant number of patients i.e 5 cases (25%) and was associated with less morbidity.

Out of 20 cases studied 15 were male patients and 5 were female patients constituting 75% and 25% respectively. Patients ranged from 40 years to 70 years with mean age being 55.7 years. Upper GIT malignancies show increasing trend with age. Similar to that seen in other studies. Ozmen MM et al study comprised 48 patients ranging from 26 – 72 years (mean 54.5) with 26 males and 22 females.<sup>7</sup>

Lehnert T et al study comprised 120 patients ranging from 30 – 84 years (mean 65 years) with 78 males & 42 females. Age group studied was found to be in accordance to other studies.<sup>8</sup>

Our Study group had 20 cases comprising 3 (15%) cases of lower esophageal tumours, 15 (75%) cases of stomach & 2 (10%) cases of duodenal tumours. Muntean V et al study comprised 119 cases with 6 primary locations studied. Stomach tumours were 45 (37.8%), 20 (16.8%) cases of lower esophageal tumours and only 4 cases of duodenal tumours.<sup>9</sup>

Liver metastases was found in 5 (25%) of cases while 15 cases had no liver involvement on Staging Laparoscopy. Lehnert T et al had 3(20%) patients with liver metastases out of 15 patients undergoing staging laparoscopy precluding surgery.<sup>8</sup> Muntean V et al study revealed liver metastases in 12(12.12%) patients out of 99 patients. But 18 out of 20 cases of colon tumour had liver metastases with 2 of them being unresectable.<sup>9</sup> Ozmen MM et al study showed liver metastases in 18 (33.3%) cases out of total 48 patients.<sup>7</sup> Thus in various studies, Liver metastases on diagnostic laparoscopy are found in about 12 – 33% of cases. It was seen in 25% of cases in our study, which was found to be similar to other similar studies.

Peritoneal nodules were found in 4 (20%) cases in our study. Two cases were seen in patients with stomach malignancies. One case was seen in lower esophageal and one case in duodenal malignancies. had peritoneal nodules. Muntean V et al study revealed peritoneal seeding in 32 (32.3%) cases & in 1 case of lower esophageal malignancy out of 99 cases.<sup>9</sup> Ozmen MM et al study on gastric cancer revealed peritoneal seeding in 8 cases (16, 6%) out of 48 cases.<sup>7</sup>

Thus previous studies have revealed Peritoneal seeding in 16 – 32% cases. In our study it was found to be in 20% cases which were in accordance to the other studies. These peritoneal nodules were missed on CT scan & other imaging modalities. Staging laparoscopy was found to be most sensitive modality for peritoneal seedlings.

In our study Ascitic fluid was found in 3(15%) cases. Ascitic fluid was aspirated in each case and sent for cytological analysis. No irrigation cytology was done in this study. Most of the case had free fluid evident on pre-operative imaging modality had negative cytology on Ascitic fluid analysis pre operatively. Ozmen MM et al had positive peritoneal cytology in 11 cases out of 48 (22.9%).<sup>7</sup>

Our study results are not comparable to other studies as peritoneal cytology was not routinely performed procedure. It was not done if no ascitic fluid was found on staging laparoscopy.

Lymph nodes were found to be involved by lymphatic spread from tumors which is seen quite early in tumors spread. In our study lymph nodal metastases was found in 19 out of 20 patients. It does not prevent curative resection unless extensive involvement (N3 status). Even in such cases palliative resection is possible, so lymph node staging as independent predictor does not have much impact in changing management & preventing exploratory laparotomies.

Upon staging laparoscopy, in our study 15 cases were deemed Resectable & 5 cases as Unresectable. In our study 25% cases were found to be Unresectable on Staging Laparoscopy. These patients were prevented from undergoing unnecessary exploratory laparotomy. Muntean V et al in his study had 36 (36.4%) patients avoided from undergoing unnecessary laparotomies.<sup>9</sup> Hemming AW et al in their study feel that laparoscopic staging in upper GIT malignancies is of value & will prevent up to 36% of futile laparotomies.<sup>10</sup>

25% patients in our study were prevented from unnecessary laparotomy which was lower than seen in other studies. Most of the patient found to be Unresectable did not had severe obstructive symptoms and thus present later in the disease stage.

Mean duration of Staging Laparoscopy was 28.83 min. It was little higher in unresectable group compared to resectable (31.76 vs. 27.35 mins respectively) which was not found to be significantly different. Muntean V et al in their study had 48 mins mean operative time for SL (25-90mins.) In this study extended staging laparoscopy, peritoneal lavage, LUS including colour Doppler was done resulting in more mean time for SL.<sup>9</sup>

Short duration procedure that is based only on inspection of abdominal organ surfaces can be performed quickly (usually within 10–20 min), can be done through one or two ports and has good diagnostic accuracy. Extensive procedure includes opening up lesser sac, assessment of vessels & LUS which is more time consuming but increases diagnostic accuracy.

Procedure related complications were seen in 2 cases in our study out of which

1 case was resectable which had intra-abdominal collection. Only 1 case of unresectable group had minor wound sepsis. There was no mortality in the study group.

## CONCLUSION

Staging laparoscopy has a very significant role in upper GIT malignancies. It is very accurate in assessing peritoneal seeding, hepatic metastases which are not found on imaging modalities.

A short SL performed just before the planned surgical procedure to certify the operability is found to be safe & very effective and need not be performed as a separate procedure. But short SL is less sensitive in staging compared to extended SL and use of LUS

Staging Laparoscopy gives additional information regarding extent of the disease intra-abdominally which changes the course of management in significant number of patients. Staging laparoscopy had a significant impact on decisions regarding the treatment plan in patients. It helps in more careful planning of palliative & resectional procedure in advanced conditions.

Staging Laparoscopy has added benefit of performing biopsy from sites of dissemination & having histological confirmation. Staging Laparoscopy spares malignancy patients from unnecessary laparotomies and has an associated decreased morbidity & pain, faster recovery and earlier time to adjuvant treatment.

Staging Laparoscopy has been found to significantly decrease the hospital stay & cost expenditure when compared to open exploration.

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