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## Role of Staging Laparoscopy in Gastric Carcinoma

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**Abstract:** Laparoscopy is a minimally invasive procedure used as a diagnostic tool and surgical procedure that is performed to examine the abdominal and pelvic organs. Staging laparoscopy is minimally invasive surgery for the diagnosis of intra-abdominal diseases. Despite increasingly sophisticated radiological diagnostic equipment, many patients with gastric, hepatic, or pancreatic malignancy continue to have the diagnosis of unresectable or metastatic disease made at exploratory laparotomy. Staging laparoscopy may aid in the more accurate staging of gastric cancers and guide appropriate treatment without the morbidity associated with exploratory laparotomy.

**Keywords:** Gastric Carcinoma, Staging Laparoscopy.

### INTRODUCTION

Laparoscopy is a minimally invasive procedure used as a diagnostic tool and surgical procedure that is performed to examine the abdominal and pelvic organs. The word 'Laparoscopy' comes from words 'Lapara' which means 'soft part of the body between the rib margins and hips' or more simply 'flank or loin'. The other Greek root is 'Skopein' which means 'to see or view or examine'. Skopein has become scope in English. A Russian gynecologist, Dimitri Ott, is credited with the first recorded human laparoscopic examination in 1901. The term "laparoscopthorakoskopie" was coined by H.C. Jacobaeus, who in 1911 reported the first clinical experience with this technique<sup>1</sup>. He noted that cirrhosis, malignancy, tuberculosis, and syphilis could be identified. The first recorded laparoscopic procedure in the United States was performed in 1911 by B.M. Bernheim of Johns Hopkins University on a patient with pancreatic cancer<sup>1</sup>. He felt that the technique "...may reveal general metastases or a secondary nodule in the liver, thus rendering further procedures unnecessary and saving the patient a rather prolonged convalescence." Despite this early promise, poor optics and inadequate instrumentation confined the acceptance of the procedure to a few enthusiasts<sup>1</sup>. It was not until the development in the 1960s of the rod-lens system by Hopkins and instrumentation for controlled pneumoperitoneum by Semm that laparoscopy began to be more widely practiced<sup>1</sup>. Staging laparoscopy is minimally invasive surgery for the diagnosis of intra-abdominal diseases. The procedure enables the direct inspection of large surface areas of intra-abdominal organs and facilitates obtaining biopsy specimens, cultures, and aspiration. It not only facilitates the diagnosis of intra-abdominal disease but also makes therapeutic intervention possible. The goal of clinical staging is to accurately define the extent of disease, direct appropriate therapy, and avoid unnecessary intervention. Despite an increasingly sophisticated radiological diagnostic equipment, many patients with gastric, hepatic, or pancreatic malignancy continue to have the diagnosis of unresectable or metastatic disease made at exploratory laparotomy. For those who do not require a palliative procedure, exploration confers little benefit and may be associated with significant morbidity and mortality affecting both the quality and duration of their survival. The aim of our study is to learn the role of staging laparoscopy in gastric carcinomas and what impact does it have in the management of the patients suffering from it. Since many patients with gastric cancer present with locally advanced or metastatic disease, accurate staging of gastric cancer aids in the appropriate treatment selection for both cure and palliation. Palliative resection may be indicated for gastric cancer causing obstruction, hemorrhage, or perforation; however, surgical resection alone for patients with advanced disease has not been shown to improve survival. Even after many pre operative radiologic tests (CT scan, endoscopic and transabdominal ultrasound, and PET scan) for the staging of gastric tumors, a proportion of patients is found to have unsuspected, unresectable disease at exploration. Thus, Staging Laparoscopy may aid in the more accurate staging of gastric cancers and guide appropriate treatment without the morbidity associated with exploratory laparotomy.

### AIM AND OBJECTIVES

In the light of recent developments in Investigations, Staging, and Management of the Carcinoma of Stomach this study was undertaken with the following Aim and Objectives.

**Aim:** To study the role of staging laparoscopy in gastric carcinoma.

**Objectives:** To study the clinical presentation of carcinoma stomach and the stage of malignancy at the time of diagnosis.

To compare staging of gastric carcinoma by CECT and its co-relation with laparoscopic staging.

To study the impact of staging laparoscopy on the management of gastric carcinoma.

### MATERIAL AND METHODS

The study was conducted at tertiary health care center- Acharya Vinoba Bhave Rural Hospital (AVBRH), Sawangi Meghe, Wardha, Maharashtra

**Duration of Study:** -From April 2014 to September 2016

**Study Design:** Prospective, Cohort, Observational study

**Study Population:** - All the newly diagnosed gastric carcinomas on upper gastrointestinal endoscopy between April 2014 – September 2016 were included in the study.

**Inclusion criteria:** All patients with Gastric Carcinoma coming to Acharya Vinoba Bhave Rural Hospital (AVBRH).

**Exclusion criteria:**

Patient with evidence of Distant Metastasis or Ascitis on CECT.

The patient does not fit for Anaesthesia.

**Sample Size:** 20-25 Patients of Gastric Carcinoma.

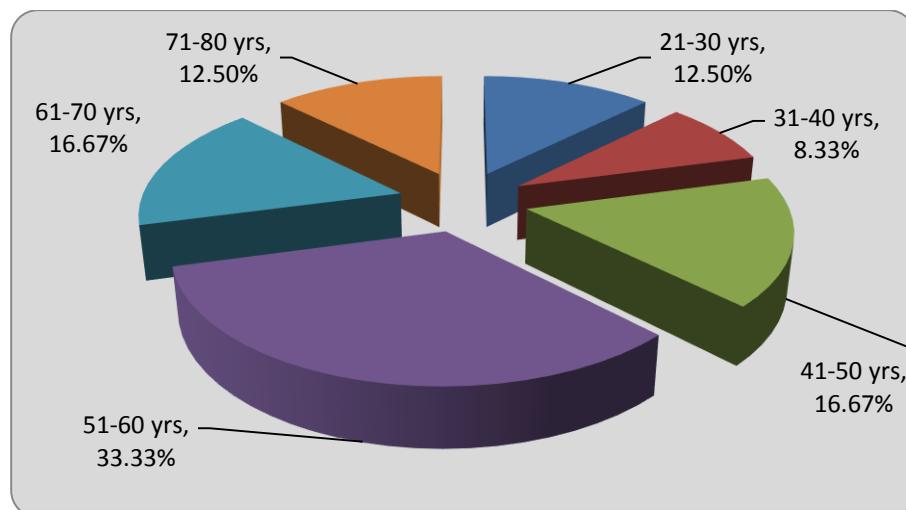
**Technique:** Staging by CECT scan (16 slices Spiral CT, Philips) was obtained after 90 mL of intravenous Iohexol (Omnipaque 350) injection and CT scan images were completed. The CT scan was reviewed and reported by a qualified radiologist and followed by operating the surgeon. Staging laparoscopy was done under general anesthesia in the supine position after complete work up of the patient. Three ports (one 10 mm paraumbilical, one 5 mm port at the right upper quadrant and one 5mm port at the left upper quadrant) were used and pneumoperitoneum was created with carbon dioxide and maintained at a pressure of 12-14 mmHg. The 30 degree scope was used to assess the primary tumor for serosal involvement and local infiltration, the liver, Peritoneum and omentum for metastasis, and lymph nodes for enlargement. Inspection of omental bursa by extended laparoscopy was also performed.

Peritoneal cytology was obtained by introducing 100 mL of 0.9% saline into the peritoneal cavity and aspirating the fluid from several areas of the peritoneal cavity and sent for cytology study. Laparoscopic findings further determined the management of the patient and were subsequently compared with the CECT findings.

### OBSERVATION AND RESULTS

**Table 1: Age wise distribution of patients**

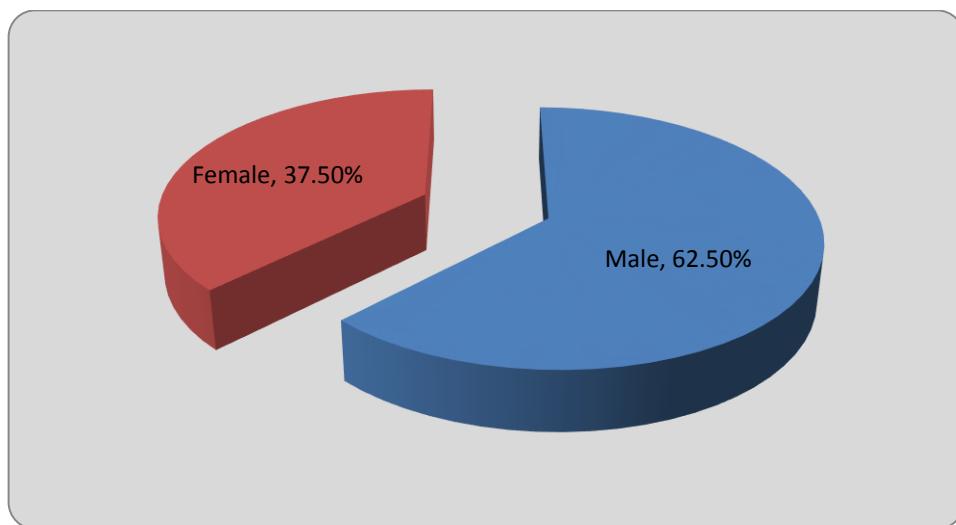
Age Group(yrs)	No of patients	Percentage (%)
21-30 yrs	3	12.50
31-40 yrs	2	8.33
41-50 yrs	4	16.67
51-60 yrs	8	33.33
61-70 yrs	4	16.67
71-80 yrs	3	12.50
Total	24	100.00
Mean Age	$53.58 \pm 14.58$ ( 25 – 80 years)	



Maximum no. of patients (33.33%) were found in 51-60 year age group. The incidence was highest in 6<sup>th</sup>decade of life. The youngest patient was 25 year old and the oldest was 80 year old. The mean age was 53.58 years.

**Table 2: Gender wise distribution of patients**

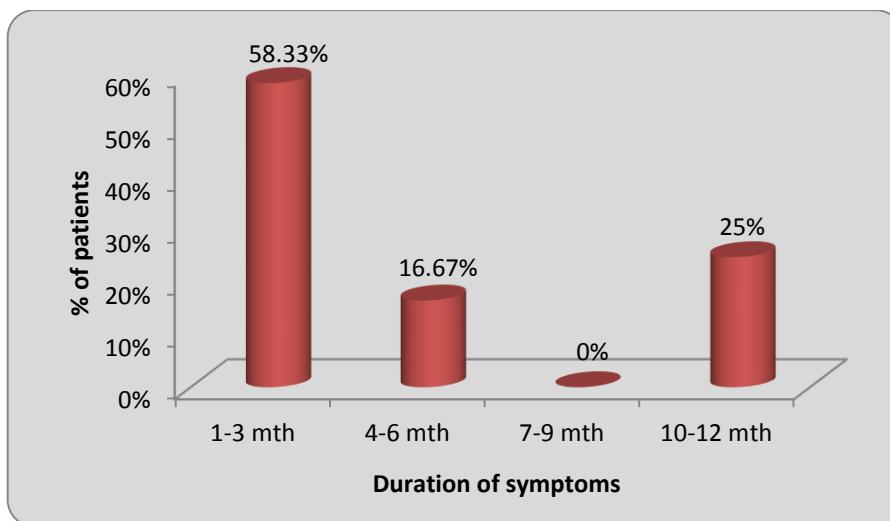
Gender	No of patients	Percentage (%)
Male	15	62.50
Female	9	37.50
Total	24	100.00



The incidence of carcinoma of the stomach was found to be in 15 males (62.50%) and in 9 females (37.50%) and the male to female ratio was 1.67:1.

**Table 3: Distribution of patients according to duration of symptoms**

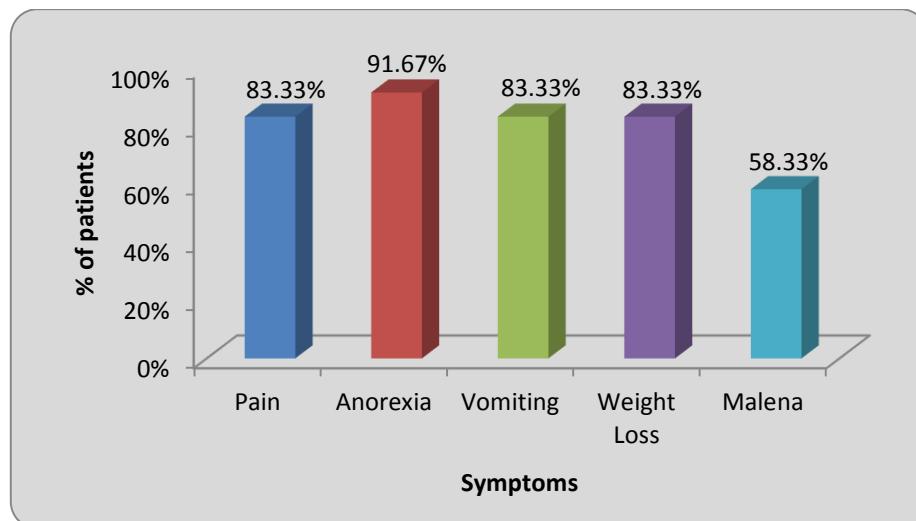
Duration of symptoms	No of patients	Percentage (%)
1-3 mth	14	58.33
4-6 mth	4	16.67
7-9 mth	0	0.00
10-12 mth	6	25.00
Total	24	100.00
Mean Duration	$5.00 \pm 4.47$ ( 1-12 mths)	



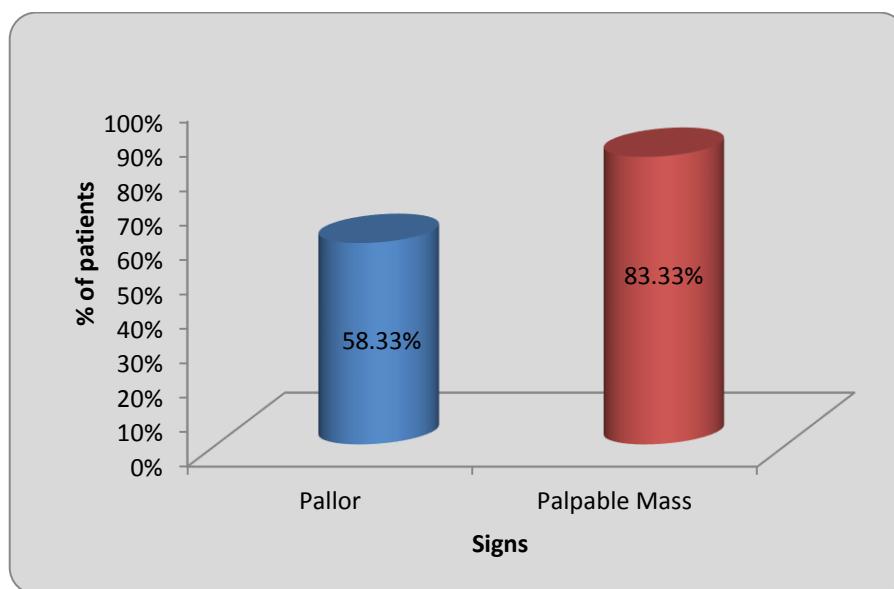
The mean duration of symptoms was found to be 5 months

**Table 4: Distribution of patients according to signs and symptomatology**

Symptomatology	No of patients	Percentage (%)
<b>Symptoms</b>		
Pain	20	83.33
Anorexia	22	91.67
Vomiting	20	83.33
Weight Loss	20	83.33
Malena	14	58.33
<b>Signs</b>		
Pallor	14	58.33
Palpable Mass	20	83.33



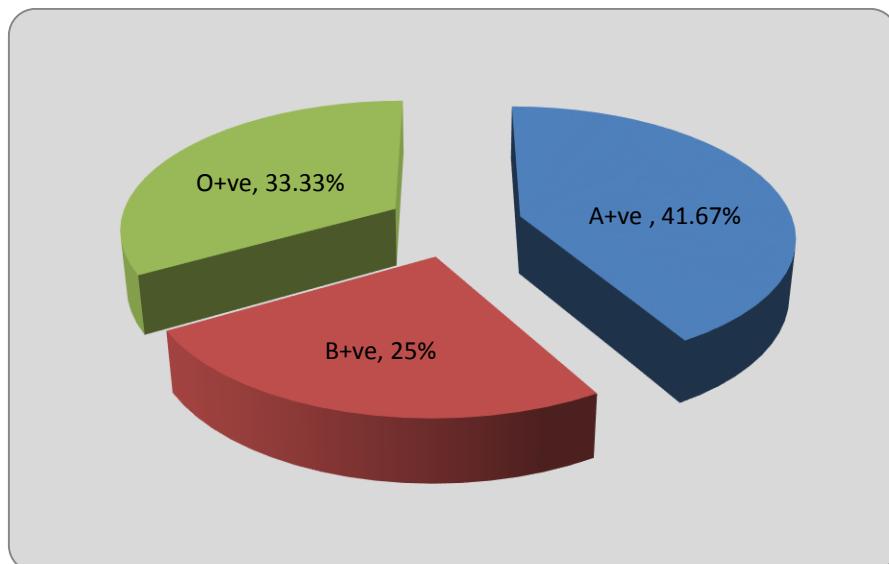
Most common symptom associated with carcinoma stomach was anorexia which was present in 22 patients (91.67%) followed by pain, weight loss and vomiting in 20 cases (83.33% each) Malena was found in 14 cases (58.33%). Anorexia with pain was seen in 20 cases (83.33%) Anorexia, pain, and weight loss were seen in 16 cases (66.67%) Anorexia, pain, weight loss and vomiting was seen in 16 cases (66.67%) And all the above symptoms were seen in 12 cases (50 %).



Most common sign was palpable lump which was found in 20 cases (83.33%) followed by pallor in 14 cases (58.33%)

**Table 5: Distribution of patients according to Rh blood group**

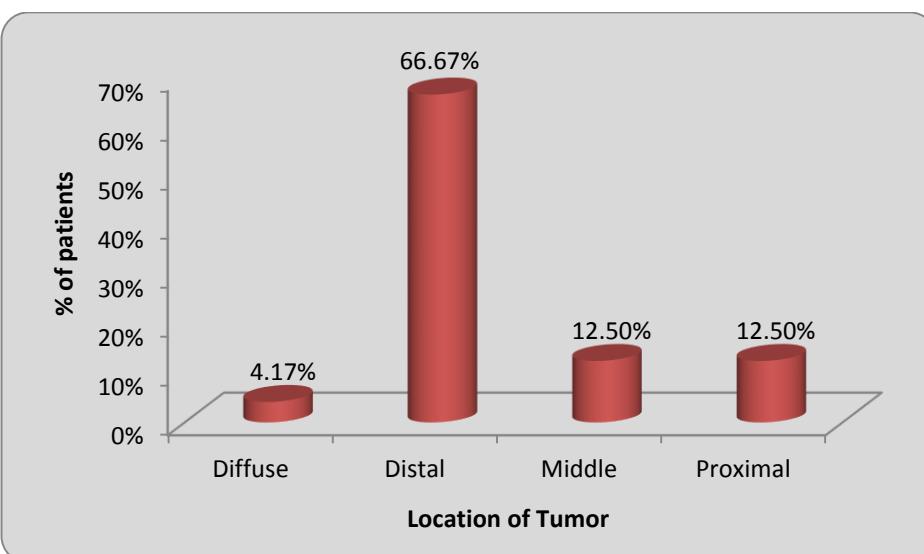
Rh Blood Group	No of patients	Percentage (%)
A+ve	10	41.67
B+ve	6	25.00
O+ve	8	33.33
Total	24	100.00



A +ve blood group was found out to be present in maximum patients (10 patients- 41.67%) followed by O +ve in 8 patients (33.33%) and B +ve in 6 patients ( 25%)

**Table 6: Distribution of patients according to location of tumor**

Location of tumor	No of patients	Percentage (%)
Diffuse	2	4.17
Distal	16	66.67
Middle	3	12.50
Proximal	3	12.50
Total	24	100.00



The tumor was located in distal 1/3<sup>rd</sup> in 16 cases (66.67%). Middle and Proximal 1/3<sup>rd</sup> accounted for 12.50% each (3 cases each). And diffuse variety was seen in 2 cases (4.17%)

**Table 7: CECT staging and comparison with laparoscopic staging**

CECT staging↓ Laparoscopic Staging→	IIA	IIB	III A	III B	IV
IIA	2(8.33%)	0(0%)	0(0%)	1(4.17%)	0(0%)
IIB	0(0%)	2(8.33%)	0(0%)	1(4.17%)	0(0%)
IIIA	0(0%)	1(4.17%)	4(16.67%)	2(8.33%)	3(12.50%)
IIIB	0(0%)	0(0%)	0(0%)	4(16.67%)	2(8.33%)
IIIC	0(0%)	0(0%)	0(0%)	0(0%)	2(8.33%)
Total	2(8.33%)	3(12.50%)	4(16.67%)	8(33.33%)	7(29.17%)
$\chi^2$ -Value	37.20, P=0.0001, Significant				

CECT staging↓ Laparoscopic Staging→	N0	N1	N2	N3	Total
N0	2(8.33%)	0(0%)	2(8.33%)	0(0%)	4(16.67%)
N1	0(0%)	5(20.83%)	1(4.17%)	0(0%)	6(25%)
N2	0(0%)	3(12.50%)	7(29.17%)	1(4.17%)	11(45.83%)
N3	0(0%)	0(0%)	0(0%)	3(12.50%)	3(12.50%)
Total	2(8.33%)	8(33.33%)	10(41.67%)	4(16.67%)	24(100%)
$\chi^2$ -Value	34.99, P=0.0001, Significant				

CECT staging↓ Laparoscopic Staging→	T1	T2	T3	T4	Total
T1	-	-	-	-	-
T2	-	-	-	-	-
T3	-	0(0%)	8(33.33%)	6(25%)	14(58.33%)
T4	-	1(4.17%)	0(0%)	9(37.50%)	10(41.67%)
Total	-	1(4.17%)	8(33.33%)	15(62.50%)	24(100%)
$\chi^2$ -Value	9.18, P=0.010, Significant				

**Table 8: Statistical analysis of CECT findings vis-à-vis laparoscopic findings**

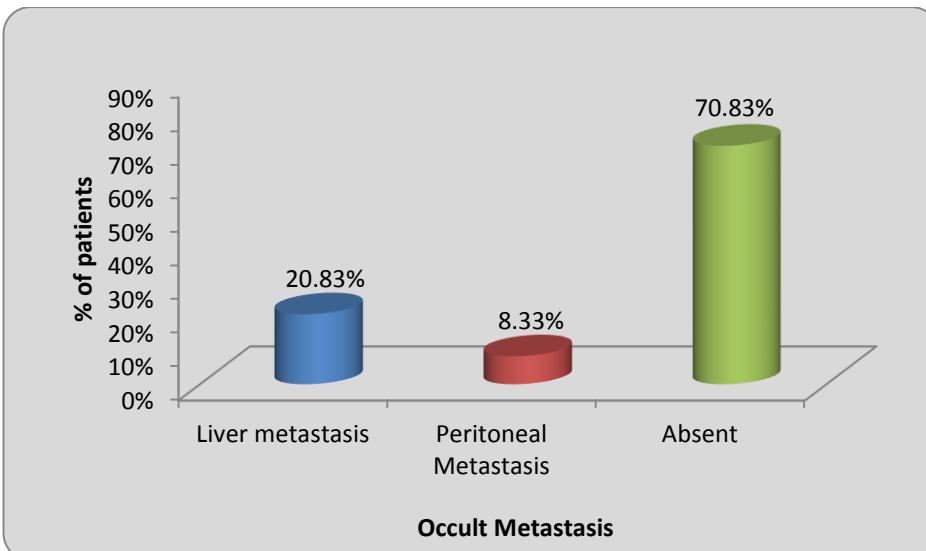
	Sensitivity		Specificity		PPV		NPV		Accuracy	
	CT	LAP	CT	LAP	CT	LAP	CT	LAP	CT	LAP
IIA	77.78	100	80	95.45	70	66.67	85.72	100	79.16	95.83
IIB	66.67	100	76.21	95.45	80	66.67	81.21	100	83.1	95.83
IIIA	78.51	100	72.12	73.68	80	50.00	83.33	100	84.21	79.16
IIIB	81.82	100	75	90	75	66.67	81.82	100	81.29	83.23
IIIC	80.25	100	78.12	95.45	76.01	66.67	72.56	100	79.56	95.83

	Sensitivity		Specificity		PPV		NPV		Accuracy	
	CT	LAP	CT	LAP	CT	LAP	CT	LAP	CT	LAP
N0	82.16	100	81.25	90.91	81.25	100	85.26	100	79.52	91.66
N1	76.51	83.52	80.51	93.75	71.56	83.33	80.12	83.33	81.56	83.33
N2	78.12	86.52	80.12	91.23	79.23	76.12	79.32	95.12	82.12	85.11
N3	80.21	89.12	78.51	100	82.32	95.24	81.21	100	85.21	89.12

	Sensitivity		Specificity		PPV		NPV		Accuracy	
	CT	LAP	CT	LAP	CT	LAP	CT	LAP	CT	LAP
T2	100	100	-	-	100	100	-	-	100	100
T3	72.73	100	76.92	83.21	72.73	79.12	76.92	100	77.21	87.12
T4a	81.82	89.11	69.23	75.23	73.11	78.51	78.12	83.56	80.56	86.11
T4b	63.23	100	61.11	79.23	29.12	66.13	78.12	100	79.25	81.23

**Table 9: Distribution of patients according to Occult metastasis**

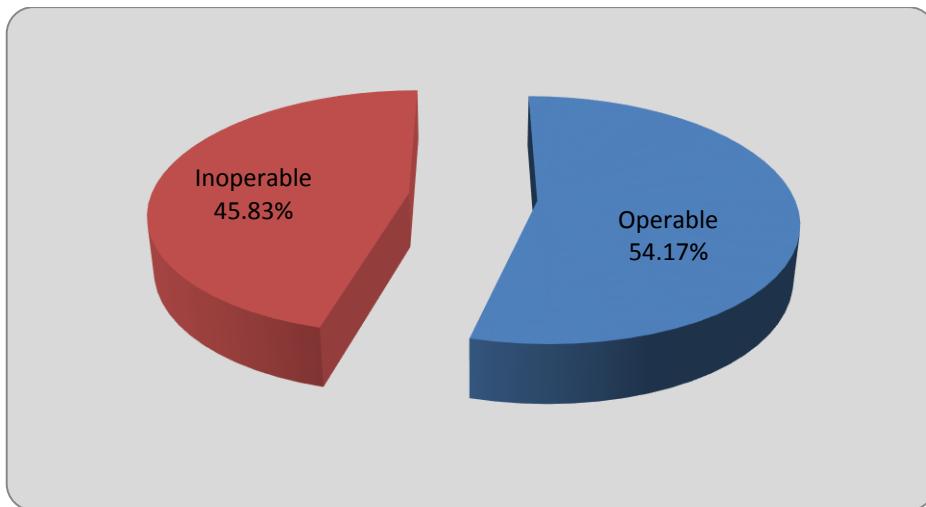
<b>Occult metastasis</b>	<b>No of patients</b>	<b>Percentage (%)</b>
Liver metastasis	5	20.83
Peritoneal Metastasis	2	8.33
Absent	17	70.83
Total	24	100.00



Occult metastasis was found in 7 cases of liver metastasis present in 5 (20.83%) cases and peritoneal seedlings /Metastasis in 2 (8.33%) cases.

**Table 10: Distribution of patients according to Operability After laparoscopic staging**

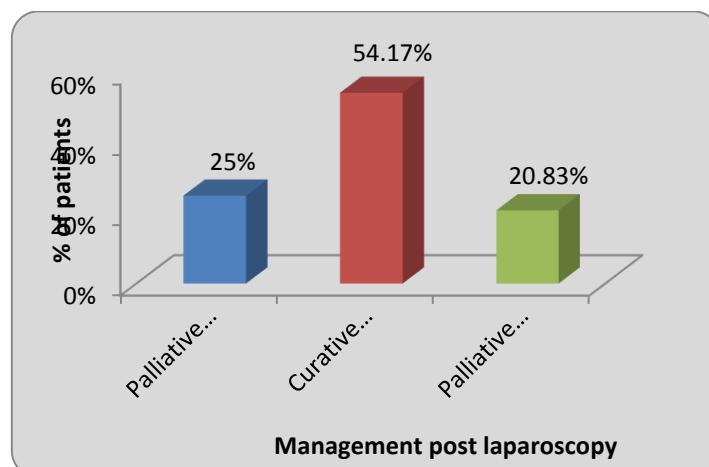
<b>Operability</b>	<b>No of patients</b>	<b>Percentage (%)</b>
Operable	13	54.17
Inoperable	11	45.83
Total	24	100.00



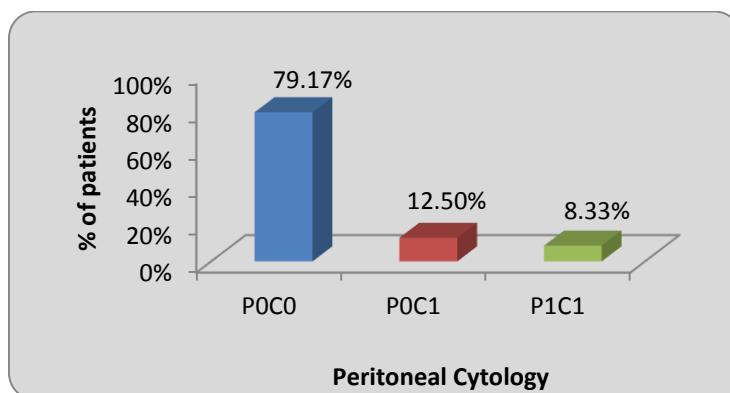
In 13 patients (54.17%) Laparoscopic findings were found to be in accordance with CECT findings and these cases further underwent explorative laparotomy for curative resection. 11 patients (45.83%) were found to be understated by CECT of which Palliative surgery was performed in 6 cases (25%). In 5 patients (20.83%) Laparoscopy avoided undue exploration.

**Table 11: Distribution of patients according to management post laparoscopy**

Management	No of patients	Percentage (%)
Curative Resection followed by adjuvant chemotherapy	13	54.17
Palliative Surgery followed by palliative chemotherapy	6	25.00
Palliative Chemotherapy alone	5	20.83
Total	24	100.00

**Table 12: Distribution of patients according to toperitoneal cytology**

Peritoneal Cytology	No of patients	Percentage (%)
P0C0	19	79.17
P0C1	3	12.50
P1C1	2	8.33
Total	24	100%



In 5 patients (20.83) peritoneal cytology was positive for malignant cells of which 3 patients (12.50%) did not have peritoneal seedlings (P0C1) whereas 2 patients (8.33%) had peritoneal seedlings on laparoscopy (P1C1). In 19 patients (79.17%) peritoneal cytology was negative for malignant cells.

Statistical analysis was done by using descriptive and inferential statistics using Chi-square, sensitivity, specificity, PPV and NPV and software used in the analysis were SPSS 17.0 version, GraphPad Prism 600 version and  $p < 0.05$  is considered as the level of significance ( $p < 0.05$ ).

## DISCUSSION

1. In the present study maximum number of patients (33.33%) of carcinoma stomach were found in age group of 51-60 years. The incidence was highest in 6th decade of life. The youngest patient was 25 years old and the oldest was 80 years old and the mean age was 53.58 years where as median was 56 years.

In the study conducted by Andronik Kapieu MD (2010) age of the patients ranged from 39 to 89 years.<sup>1</sup>

Chprungoo et al. (2015) found that the youngest patient was 30 years old female and oldest was 84 years old male. The mean age was 59.8 years. The highest incidence was in the 51-70 years (72%).<sup>2</sup>

Shelat VG et al. (2012) found that the mean age of presentation was 63.3 years (range 41 years to 87 years).<sup>3</sup>

Lehnert et al (2002) found the median age of 65 years with range of 30-84 years.<sup>4</sup>

2. In the present study carcinoma of the stomach was found in 15 males (62.50%) and in 9 females (37.50%) and the male to female ratio was 1.67:1. Male preponderance was consistent with the studies conducted by others.

In the study conducted by Lehnert et al (2002) Carcinoma stomach was found in 78 males (65%) and 42 females (35%) and male female ratio was 1.86:1. 4

Shelat VG et al.(2012) found that 18 (66.7%) of these patients were male 9 and (33.3%) were female. Male: Female Ratio 2:1. 3 Whereas Chrungoo et al (2015) found that there were 19 (76%) males as against 6 females (24%). Male: Female ratio was 3.17:1. 2

No male preponderance was found in the in the study conducted by Andronik Kapieu MD (2010) as there were 39 men (50%) and 39 Women (50%). Male:Female ratio was 1:1. 1

3. In the present study the mean duration of symptoms was found to be 5 months.

In study conducted by Chrungoo et. al.(2015) the mean duration of symptoms were 7.34 months. 2

4.In our present study most common symptom associated with carcinoma of the stomach was anorexia which was present in 22 patients(91.67%) followed by pain, weight loss and vomiting in 20 cases (83.33% each) malena was found in 14 cases (58.33%).Anorexia with pain was seen in 20 cases ( 83.33%) Anorexia, pain and weight loss was seen in 16 cases (66.67%) Anorexia, pain, weight loss and vomiting was seen in 16 cases (66.67%) And all the above symptoms were seen in 12 cases (50%). Whereas study conducted by Chrungoo et al, (2015) Pain was the predominant symptom in 14 (56%) patients despite the fact that dyspepsia and sour eructations were the commonest symptom. Pain was followed by anorexia (12%) and vomiting (8%) as the predominant symptom. Though pain was present in 18 (72%) patients, pain associated with vomiting was seen in 15 patients (60%), while the combination of pain, vomiting, weight loss was present in 13 patients (52%), and the combination of pain, vomiting, anorexia, weight loss was seen in 12 patients (48%) patients. 2

5. In our study most common sign was palpable lump in the epigastric region which was found in 20 cases (83.33%) followed by pallor, seen in 14 cases (58.33%).

This was not consistent with the study conducted by Chrungoo et al (2015) who recorded pallor as the commonest sign accounting for 16 (64%) cases. 2

6. In our study A +ve blood group was found out to be present in maximum patients (10 patients- 41.67%) followed by O +ve in 8 patients (33.33%) and B +ve in 6 patients (25%).

In the study conducted by Chrungoo et al (2015) Blood group A+ve was the most common being present in 11 (44%), followed by O+ve which was seen in 7(28%). 2

7. In present study the tumor was located in distal 1/3rd in 16 cases (66.67%). Middle and Proximal 1/3rd accounted for 12.50% each (3 cases each). And diffuse variety was seen in 2 cases (4.17%).

In the study done by Andronik Kapieu MD(2010) the tumor was located in the upper third of the stomach including the gastroesophageal junction (Siewert Type II, III ) in 12 patients, in the middle third of the stomach in 13, and in the lower third in 27. In three patients, the diagnosis was limitis plastica which were consistent with our study. 1

Also Chrungoo et al (2015) found that the site of carcinoma of stomach was distal one third in 15 (60%) patients, proximal one third in 3(12%) patients, middle one third in 2 (8%) and diffuse involvement was seen in 5 (20%) patients similar to our study.2

Whereas Shelat VG et. al.(2012)noted the commonest site of gastric adenocarcinoma was the cardio-oesophageal junction (58%). Other sites of involvement were the antrum (15%), greater curve (8%), lesser curve (8%) and body (8%) and one patient had limitis plastica which showed dissimilarity with our study. 3

8. In present study regarding nodal (N) status, CECT Sensitivity, Specificity and Accuracy were 79.25%, 78.59% and 82.10% respectively and that of laparoscopic staging were 89.79%, 93.97% and 87.30% respectively.

Showkat majeed kakroo et al. (2013) As regards the nodal (N) status, CECT correctly staged 26 (72%) patients. It overstaged 4 (11.11%) patients, and understaged 6 (16.7%) patients. CECT had a sensitivity of 50% and a specificity of 90% for N staging. The overall accuracy of laparoscopy for N staging was 88% as against 86% of CECT scanning with a sensitivity of 53% and a specificity of 91% ( $P = 0.4324$ ).5

Possik et al. (1986) reported an overall accuracy of laparoscopy for N staging as 58.4% with a sensitivity of 60% and a specificity of 90%. 6

Similar results were observed by a study conducted by Muntean et al. (2009) in which the overall laparoscopic N staging accuracy was 64.3% with a sensitivity of 54.5% and a specificity of 100%. 7

Chrungoo et al. (2015) found Diagnostic laparoscopy had sensitivity of 100%.2

O'Brien et al (1995) found that laparoscopy had a sensitivity of 77% compared to 38% with CT scan and EUS combined. 8

9. In present study Laparoscopic findings in 13 patients (54.17 %) were found to be in accordance with CECT findings and these cases further underwent explorative laparotomy for curative resection. 11 patients (45.83%) were found to be understaged by CECT of which Palliative surgery was performed in 6 cases (25%). In our study no downstaging was found.

Nakagawa et al. (2007), regarding the role of exploratory laparoscopy and peritoneal cytology in the gastric adenocarcinoma, 47% of cases were re-staged, 3% with an inferior stage, and 44% with a more advanced stage. 9

Andronik Kapieu MD (2010) In 55 patients (70.5%) the DL was judged negative and upstaging was seen in 23 patients (29.5%). 1 Chrungoo et al (2015) Growth was resectable in 10(40%) patients, while in 15(60%) it was unresectable. 2

Showkat Majeed Kakroo (2013) it overstaged 4 (11.11%) patients, and understaged 6 (16.7%) patients.5

10. In our present study occult metastasis was found in 7 (29.17%) cases of which liver metastasis was present in 5 (20.83%) cases and peritoneal seedlings /Metastasis in 2 (8.33%) cases. Staging laparoscopy has been proven to be the most useful method in diagnosing Occult metastasis.

Sarela et al. (2006) have conducted the study and applied on 657 cases of gastric cancer and has identified 31% of metastasis cases. 10

Nakagawa et al. (2007), found 22.6% of cases with occult peritoneal metastases and were identified at the anterior paraclinical exams. In 29% of cases neoplastic cells were identified in the peritoneal lavage. 9

In a study conducted by Lehnert et al. (2002) in 40% cases diagnostic laparoscopy identified metastasis (peritoneal and/or liver). 4 11. In Present study Laparoscopy avoided undue exploration in 5 patients (20.83%) who were found to be unresectable and having distant metastasis due to accurate assessment of serosal infiltration, distant metastasis and peritoneal seedlings.

Similar findings were noted by Chrungoo et al (2015) in which Diagnostic laparoscopy avoided laparotomy in 4 (16%).2

Burke et al. (1998). Also found that laparoscopy avoided laparotomy in 23.1% cases. 11

Karanicolias et al (2011) found that up to 30% of patients could avoid futile laparotomy if staging laparoscopy was performed. 12

Muntean et al (2009) studied that an unnecessary laparotomy was avoided in 17 (37.8%) patients. 7

Molloy et al. (1995) avoided laparotomy in 42.2% cases.13

Shelat VG et al. (2012) found staging laparoscopy avoided unnecessary laparotomy in 48% of patients Similar to our study. 3

12. In present study in 5 patients (20.83) peritoneal cytology was positive for malignant cells of which 3 patients (12.50%) did not have peritoneal seedlings (P0C1) whereas 2 patients (8.33%) had peritoneal seedlings on laparoscopy (P1C1). In 19 patients (79.17%) peritoneal cytology was negative for malignant cells (P0C0).

Muntean et al (2009) also noted similar findings in the 45 patients with SL the peritoneal cytology was positive (CY1) in 19 (42%) patients and negative for malignant cells (CY0) in 26 (58%) patients. 7

Nakagawa et al (2007) also found that 29% of patients had positive cytology in the absence of obvious malignant deposits. 9

## SUMMARY AND CONCLUSION

A maximum number of the patients diagnosed with carcinoma stomach (33.33%) were found in the 6<sup>th</sup> decade of life. Male preponderance in gastric carcinoma was consistent with the studies conducted by others. Most common symptom associated with carcinoma stomach was anorexia which was present in 22 patients (91.67%) followed by pain, weight loss and vomiting in 20 cases (83.33% each) and malena was found in 14 cases (58.33%).The most common sign was a palpable lump in the epigastric region which was found in 20 cases (83.33%) followed by pallor, seen in 14 cases (58.33%). A +ve blood group was found out to be present in maximum patients (10 pts 41.67%). The malignancy was located in distal 1/3<sup>rd</sup> in 16 cases (66.67%). Middle and Proximal 1/3<sup>rd</sup> accounted for 12.50% each (3 cases each) and diffuse variety was seen in 2 cases (4.17%). Regarding nodal (N) status, CECT Sensitivity, Specificity, and Accuracy were 79.25%, 78.59%, and 82.10% respectively and that of laparoscopic staging were 89.79%, 93.97% and 87.30% respectively. Laparoscopic findings in 13 patients (54.17 %) were found to be in accordance with CECT findings and these cases further underwent explorative laparotomy for curative resection. 11 patients (45.83%) were found to be understated by CECT of which Palliative surgery was performed in 6 cases (25%). In our study, no downstaging was found. Occult metastasis was found in 7 (29.17%) cases of which liver metastasis was present in 5 (20.83%) cases and Peritoneal Seedlings/ Metastasis in 2 (8.33%) cases. Staging laparoscopy has been proven to be the most useful method in diagnosing Occult metastasis. Laparoscopy avoided undue exploration in 5 patients (20.83%) who were found to be unresectable and having distant metastasis due to an accurate assessment of serosal infiltration, distant metastasis, and peritoneal seedlings. In 5 patients (20.83) peritoneal cytology was positive for malignant cells of which 3 patients (12.50%) did not have peritoneal seedlings (P0C1) whereas 2 patients (8.33%) had peritoneal seedlings on laparoscopy (P1C1). In 19 patients (79.17%) peritoneal cytology was negative for malignant cells (P0C0). Thus, the exact pre-surgical staging reduces the number of unindicated laparotomies and permits the initial orientation towards other treatment options.

## LIMITATIONS

The sample size was not large enough when compared with the published series.

The inability of laparoscopy in detecting early gastric carcinoma was another demerit.

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