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Original Research Article

D2 Lymphadenectomy in Carcinoma Stomach: An Experience Revisited

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Abstract: Significant variability exists throughout the world in the extent of lymphedenectomy which is performed for Gastric adenocarcinoma. Lymph node metastasis is the most important prognostic factor in gastric cancer and for this reason gastrectomy with lymphadenectomy is the only curative treatment option for it. This article reviews the evidence on the extent of lymphadenectomy that should be performed for gastric adenocarcinoma. For the present retrospective study we considered 46 patients from which 40 are resectable and undergone surgical resection and D2 lymphadenectomy for gastric adenocarcinoma from January 2009 – December 2011. Total gastrectomies were performed in 18 patients and rest 22 patients were undergone radiacl D2 gastrectomy. We tried to remove minimum of 16 lymph nodes. Most of the cases are of stage II and III. After 3 years of follow-up of our patients mortality rate is 2 (5%) and recurrence rate is 5 (12.5%).
Keywords: gastric adenocarcinoma, lymphadenectomy, surgery, stage, survival.

INTRODUCTION

Carcinoma stomach is a major public concern throughout the world. It is the second most common malignancy in Asia after carcinoma lung and one of the leading causes of cancer death [1]. Different types of gastric malignancies are adenocarcinoma, lymphoma, carcinoid, and sarcoma. Out of which Gastric adenocarcinoma accounts for over 90% of all cases of gastric cancers globally [2]. For patients with gastric carcinoma deemed curable, the only treatment constitutes the RO resection, which is the prerequisite for locoregional control of gastric carcinoma. For RO resection we must consider the extent of gastric resection, extent of lymphadenectomy and extended resection of any organ involved.

As lymphnode metastasis is the most common mode of spread of malignancy, the lymph node stations surrounding the stomach have been precisely defined by the Japanese gastric cancer association (JGCA), formerly known as the Japanese Research Society for gastric cancer [3]. Lymphnode stations include both N1 (perigastric nodes closet to the stomach) and N2 (distant perigastric and nodes along the main arteries supplying the stomach) & in some cases N3 (Nodes outside the normal lymphatic drainage) [4]. Initially there was disagreement about whether accompanying lymphnode dissection should be limited to perigastric (N1) or extragastric (N2) lymphnodes. Lymphnode stations that should be removed for a D1 and D2 lymphadenctomy has been shown in the recently updated JGCA guidelines[5].Here a minimum D2 lymphadenectomy (both N1 and N2 nodes) should be done for staging and locoregional control of both early and late cases of gastric carcinoma has been explained.

AIM AND BACKGROUND

Lymphadenectomy helps in staging the extent of disease, predict prognosis and also improve survival by selectively and completely removing all metastatic lymph nodes. This study is a retrospective evaluation of necessity of routine D2 lymphadenectomy in all operable cases of gastric carcinoma. D2 lymphadenectomy was done in all operable cases of gastric carcinoma who presented to us. We tried to remove minimum of 16 lymph nodes in all cases of operable gastric carcinoma.

MATERIALS AND METHODS

Patients and methods

This is a retrospective study was done at SCB Medical College & Hospital by department of surgical gastroenterology between Jan 2009 to Dec 2011. We included patients who are fit and in good general condition. Also all the cases which are diagnosed by upper GI endoscopy and confirmed by endoscopic biopsy and operable are included. Patients with involvement of proximal stomach (Siewert type II & III) and tumors of body and antrum are included. We excluded all the advanced cases of gastric carcinoma

with gross ascites, multiple peritoneal and pelvic deposits and distant organ metastasis. Also elderly moribund patients with cardiac and pulmonary problems are excluded. Also we did not include oesophageal tumor (Siewert type I)

In this way we selected 46 patients. We worked up the patients by taking detailed history and clinical examination. We also did all the hematological investigations and radiological evaluation. In hematological investigation we did complete blood count, platelet count, chemistry profile and also occult blood test done. In radiological investigation all the patients evaluated with chest x-ray, ultrasound of abdomen and pelvis, upper GI endoscopy and biopsy, CECT of abdomen and pelvis, CECT of thorax in proximal tumors. The tests which are not routinely performed are MRI, endoscopic ultrasound, PET scan, tumor marker study, laparoscopic ultra sound and cytologic analysis of peritoneal washings. Diagnostic laparoscopy was done in some cases in which we thought to be in-operable.

Abdominal exploration done in 46 patients, among which 40(86.95%) patients found to be operable who underwent gastric resection with D2 lymphadenectomy. From these 40 patients 6(15%) patients underwent extended resection. 6(13%) patients were found to be inoperable where palliative procedures are done. In operable cases, for antral growth, D2 radical gastrectomy with roux-en-y gastrojejunostomy with jejunojejunostomy done. In tumors of proximal and mid body, we did total gastrectomy with roux-en-y esophagojejunostomy with jejunojejunostomy. In all these operable cases we removed all the nodes surrounding the stomach. i.e perigastric lymphnodes ,N1(1-6), also nodes along the main arteries supplying the stomach and distant extragastric lymphnodes are removed. We tried to remove minimum 16 lymphnodes as this is the most important prognostic factor. Extended resections like splenectomy, excision of mesocolon, resection of transverse colon done in patients where organ infiltration was present. Palliative procedures like gastrojejunostomy with jejunojejunostomy done in inoperable antral growth. In unresectable tumors of proximal part and body of stomach only feeding jejunostomy done. Most patients were discharged by tenth post-operative day. We did not try endoscopic mucosal resection as all the patients presented very late.

RESULT

A total of 46 patients were selected. Of them 26 (56%) were male and 20(44%) were female. Males outnumber females. M: F ratio 1.3:1. The age of the patients vary between 55 to 65 years. As none of the patients in our study was below 25 years and hence not included in the chart. The mean age is around 60 years.

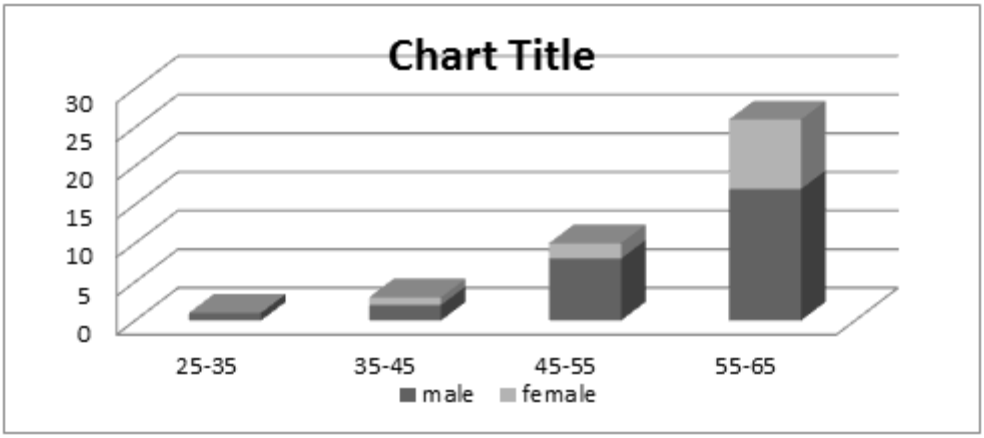

Fig-1: Age distribution in patients

Regarding the clinical presentation of gastric carcinoma in our study, the most common symptom is dyspepsia in 29 (63%) patients, followed by weight loss 25(54.3%). The less common symptoms are vomiting 18 (39%), dysphagia 12 (26%), melena 4(8.6%) and the most common signs are anorexia 26(56.5%) and palpable lump 6(13%) were found in our patients (Table 1). Not a single patient had any history of previous gastric surgery. Twenty-eight (60.8%) had history of acid peptic disease and used to take medications for that.

Table-1: Symptoms and signs

Symptoms and signs	No	%
Dyspepsia	29	63
Weight loss	25	54.3
Anorexia	26	56.5
Dysphagia	12	26
Vomiting	18	39
Palpable lump	6	13
Malena	4	8.6

We worked up the cases by doing lab tests, chemistry profiles and other radiological investigations. As shown in table 2 antral growth incidence outnumbers the tumors of body and proximal part of stomach. In comparison to an increased trend for E-C junction adenocarcinoma as suggested in western countries [6], antral growth incidence is more in our studies. The incidence of antral growth 25(54.3%) is followed by tumors of proximal part 17(37%) & body 4(8.6%) of stomach. Among 46 patients 40(87%) were found to be operable and 6 were inoperable cases. In resectable cases i.e. from 40 patients we did D2 Radical Gastrectomy with retrocolic gastrojejunostomy done in 22 (55%) patients for antral growth taking 2 cm distal and 5 cm proximal to the growth. In tumors of body and proximal part of stomach total gastrectomy with roux en y esophagojejunostomy & feeding jejunostomy done in 18(45%) patients. 4(10%) patients were found with serosal involvement.

Table-2: **Surgical Procedure**

SITE	No	%	Procedure	Unresectable
Proximal tumor	15	37.5	Total Gastrectomy + D2 lymphadenectomy + esophagojejunostomy	2
Mid body	3	7.5	Total Gastrectomy + D2lymphadenectomy + esophagostomy	1
Distal tumor	22	55	D2 Radical Gastraectomy	3

Extended resection like splenectomy with distal pancreatectomy, excision of mesocolon with resection of mid transverse colon done in 6(15%) of patients. Palliative procedures done in unrespectable 6 (13%) patients. We did gastrojejunostomy with jejunojejunostomy in unresectable antral growth and only feeding jejunostomy in tumors in body and proximal part of stomach. Not a single patient had major intraoperative complications. Mean blood loss is 150 ml. Mean duration of surgery is three and half hours.

In our series no significant complications occurred. Pulmonary complications occurred in 2(4%) of patients and 3(6%) of patients had wound infection. All these complications were managed conservatively.

Table-3: **Post op Complications**

Complication	**Number**
Upper GI bleed	Nil
Anastomotic leakage	Nil
Pancreatic fistula	Nil
Duodenal blowout	Nil
Pulmonary complication	2
Wound infection	3
In hospital stay	10 days (median)

Most of the patients i.e. 31 (77.5%) are of stage II and III. All the patients of stage I b, II and III received six cycles of chemotherapy. Chemotherapy regimen was 5Fu and Cisplatinum. We didn't recommend chemotherapy for 3(7.5%) patients as they are of stage T4, N1, M0. We followed up all the cases for 2 years and mortality is 2(5%) and recurrence is 2(5%).

Fig-2: Age distribution in patients

DISCUSSION

Surgical intervention for gastric carcinoma is the most effective therapeutic option as per all studies. Since the late 1980s' Japanese investigators have tracked the rates of gastric cancer metastatis to specific nodal stations [6]. In the last two decades the literature has shown that the results of gastric cancer surgery far better in Asia, where D2 lymphadenectomy is considered the standard and the 5year survivals rates in Japan are around 52 to 60 % compared with the figures of 10 to 30 % reported in the west [7, 8].The surgical treatment constitutes complete RO resection, which is the prerequisite for loco regional control of gastric carcinoma. For more RO resection, D2 lymphadenectomy or more extended lymph node dissection is required. The main aim of D2 lymphadenectomy for gastric carcinoma serves three purposes staging of disease, prevention of loco regional recurrence and improvement in overall survival [9]. In D2 lymphadenectomy we remove both perigastric (N1) (1-6) & extragastric (N2) (7-12) lymph nodes. Node dissection in patients who underwent D2 lymphadenectomy was performed in accordance with the recommendations of the JRSGC [7]. According to AJCC cancer staging Manual recommends a minimum of 16 lymphnodes to be examined [10]. Population based studies have demonstrated that it is difficult to be confident that a gastric cancer is truly node negative when fewer than 10 lymph nodes are examined [11, 12]. According to Lee et al D1 lymphadnectomy (perigastric lymph nodes) which had been practiced over decades in western countries, it is clear that this is not adequate for loco regional control of gastric carcinoma [13]. In our study we removed minimum of 16 lymph nodes which is a prerequisite.

Many of the patients who underwent D1 (perigastric) lymphadenectomy had recurrence which was often attributed to incomplete removal of surrounding lymph nodes. As histologically confirmed metastatic infiltration of perigastric (D1) and (D2) extragastric lymph nodes are the strongest independent prognostic factor for both early and late gastric carcinoma. So loco regional control of the disease with better outcome and increased survival which was the demand were not met by doing D1 lymphadenectomy[14].It is difficult to be confident that a tumor is truly node –ve when less than 10 lymphnodes are examined[15]. Also there is some indirect evidence that more extensive lymphadenectomy result in lower rates of locoregional recurrence. Locoregional recurrence after potentially curative surgery for gastric adenocarcinoma can be quite high [16]. D2 lymphadenectomy clearly offers the mean number of required lymph nodes for pathological examination. According to Sasako et al in patients without any lymph node metastasis, identified to be having lymph node micro metastasis, by HE staining. So D2 lymphadenectomy improves survival even in node negative early gastric cancer patients, probably due to the resection of the coexisting micrometastasis [17].

According to maruyama computer programme [18] survival with unresected lymph nodes containing gastric adenocarcinoma approaches zero percent at 5 years. Long term survival is dismal when positive nodes are found beyond the boundaries of a D2 resection, suggesting that it has progressed to a systemic disease. The overall survival rates in Japanese type indicate that with more extended lymph node dissection, more RO resections are achieved [19]. If the lymph nodes were not completely removed, the probability of the residual tumor cells would increase, leading to poor prognosis. There is no reason to conclude that the current form of D2 lymphadenectomy is more dangerous than D1 [20]. In our study, we tried to remove maximum no of lymph nodes with acceptable morbidity and mortality. Tumors categorized as N1 (1-2 positive nodes) may truly be N2 (3-6 positive nodes) or even N3a (7-15 positive nodes) as more lymph nodes are harvested [21]. Though some randomized trials shown increased morbidity and mortality in D2 only. A few patients having poor

outcome after D2 are multifunctional. Perhaps most significant factor despite having supervision is noncompliance (failure to remove the required number of lymph nodes) occurred in patients and contamination (removing additional unnecessary lymph nodes). As per Schwartz et al, better long term survival with higher number of lymph nodes resected [22]. Gee *et al*- A minimum of 25 LNS removal was recommended for adenocarcinoma of GEJ. There is no reason to conclude that the current form of D2 lymphadenectomy is more dangerous than D1 [23].

CONCLUSION

This study shows that D2 lymphadenectomy in gastric carcinoma provides a better outcome & improvement in overall survival as we have of mortality 2(5%) and recurrence of 2(5%).with the follow up of two years with acceptable morbidity. RO resection may not be possible without D2 lymphadenectomy even in node negative and early gastric carcinoma.

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