Section: General Surgery

Original Research Article

CLINICO-PATHOLOGICAL STUDY AND MANAGEMENT OF CARCINOMA OESOPHAGUS

Venkata Subbarao Gurram[1], Wasif Ali[2], Viswanath Patnala[3]

[1]*Assistant Professor, Department of General Surgery, Sri Chamundeshwari Medical College Hospital and Research Institute, Channapatna, Karnataka, India.*
[2]*Associate Professor, Department of Surgical Gastroenterology, Osmania Medical College, Hyderabad, Hyderabad, Telangana, India.*
[3]*Senior Consultant Surgical Oncologist, Chandrakala Super Speciality Hospital, Rajamahendravaram, Andhra Pradesh, India.*

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Corresponding Author:
Dr. Venkata Subbarao Gurram, Assistant Professor, Department of General Surgery, Sri Chamundeshwari Medical College Hospital and Research Institute, Channapatna, Karnataka, India.
Email: drgvsubbarao@gmail.com

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ABSTRACT

Background: To study the clinical presentations, pathological features, morbidity and mortality of patients with carcinoma esophagus who underwent definitive surgery.

Materials and Methods: This is a prospective and retrospective study of 89 patients of carcinoma esophagus, who were surgically fit with operable disease and under went a definitive surgical procedure. Patients with carcinoma GEJ were also included.

Results: Squamous cell carcinoma is still the most common malignancy in the lower 1/3 of esophagus. Most of the patients were between 41-60 yrs (64%). Smoking and alcohol are the most common risk factors in males (65%). Dysphagia is the most common presenting symptom. Most of the lesions were in the form of ulcerated growths (65%). Intraoperative complications were 5.61%. Anastomotic leak (21%) and the pulmonary complications (24%) were the most common complications. These two were also the most common associated factors with mortality which was 16.85%.

Conclusion: Esophageal carcinoma can be managed surgically with reasonable morbidity and mortality if the patient presents early.

Keywords: Esophageal adeno carcinoma, Histopathological examination, Squamous cell carcinoma, carcinoma GEJ, trans hiatal esophagectomy.

INTRODUCTION

Carcinoma of the esophagus and gastroesophageal junction (GEJ) remains one of the most difficult problems faced by surgeons. Though relatively uncommon, these tumours are historically associated with a high mortality rate because of both the late stage of disease at presentation and many challenges associated with treatment. Patients who have esophageal cancer rarely present at an early stage of their disease. Symptoms donot usually arise until the tumour is large enough to cause obstruction, or when it invades adjacent structures. The lack of serosal layer on the esophagus allows early tumour invasion into the trachea, aorta and spine (T4). The length of the time until the development of the symptoms and the rich network of lymphatic drainage make lymphnode involvement common at the time of presentation. As many as 30% of patients who have early (T1) lesions may have lymphnode metastasis. Esophageal cancer can metastasize to virtually any organ in the body, and widespread distant metastases are almost always present at the time of death.[1]

Despite ongoing advances in chemotherapy and radiotherapy, esophagectomy continues to play a vital role in the management of carcinoma esophagus. Because of the modest results achieved with surgery alone and the fact that other treatment modalities have been shown to have efficacy, multimodality treatment has became the focus of interest.

Despite advances in staging and in oncological and surgical treatment, 5- year survival rates remain stubbornly between 10% - 15% at best.[2] This emphasises the need to understand the carcinogensis from the cellular level and to identify key molecular mechanisms leading to the development and progression of esophagel cancers. State-of-the- art techniques such as gene microarrays and proteomics will greatly aid in development of new therapies

targeting specific molecular pathways ultimately leading to improved survival. Prevention strategies include smoking and alcohol cessation.

MATERIALS AND METHODS

This is a prospective and retrospective study of 89 patients of carcinoma esophagus who underwent definitive surgical management at Osmania general hospital and MNJ cancer hospital (Hospitals attached to Osmania Medical college), between January 2001 to November 2007 were included in this study.

Inclusion Criteria: All patients who were surgically fit with operable disease and underwent a definitive surgical procedure were included in this study. Patients with carcinoma GEJ were also included.

Exclusion Criteria: Patients who were medically unfit for surgery, who underwent palliative procedures like substernal bypass, feeding jejunostomy and who were found to be inoperable on exploratory laparotomy

Patients were interviewed and examined according to a proforma. Age and sex of the patient is noted. Presenting symptoms noted and the duration is noted. History of other symptoms is noted. History of loss of weight & loss of appetite are noted. History of any addiction is noted. Past history of previous diseases is noted. Past history of previous surgery is noted. Previous treatment history especially radiotherapy and chemotherapy were noted

General examination is done for any signs of anaemia, jaundice, malnourishment/ hypoprotienemia, supraclavicular lymphnodes. Examination of abdomen is done for hepatomegaly. Systemic examination of respiratory and cardiovascular system for general fitness for surgery and for any evidence of metastasis. Skeletal system examination for any bony tenderness.

UGI endoscopy for location, appearance and biopsy of lesion done in all cases and findings are noted. Routine investigations done and findings are noted. CXR PA view to detect any metastasis, any pulmonary pathology. USG abdomen is done in all cases. CT scan was done in selected patients. 2D ECHO, PFT were done in selected patients

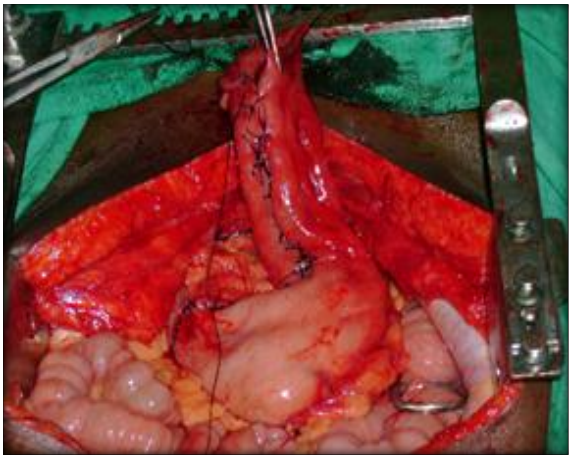
Pre operatively the nutritional status was improved by enteral feedings. Pre operatively chest physiotherapy and incentive spirometry were started

Operative approach and findings were noted. (the standard surgery was “Transhiatal Esophagectomy, Gastric Pull Up, Esophago-Gastric Anastamosis, through posterior mediastinum, Pyloric drainage FJ, Bilateral ICD, Abdominal Drain” with few exceptions)

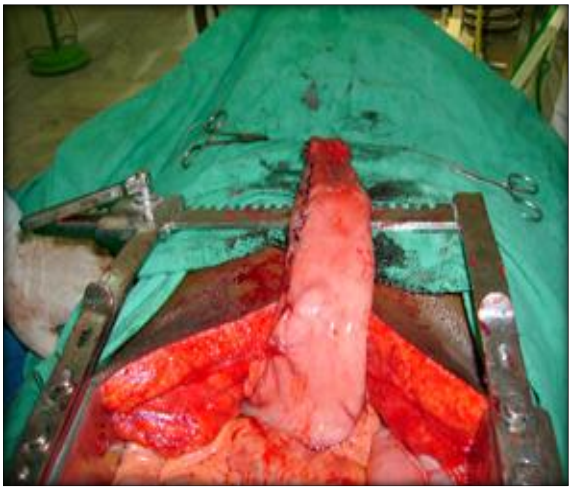
Post operatively patients were nursed in propped up position and chest physiotherapy continued. Usually the patients were started on FJ feeds on 3rd to 4th POD. Orals were allowed depending on the postoperative course., so also the removal of ICDs.

The patients were followed up for early morbidity and mortality, i.e., for 30 days after surgery and the results were analyzed. During follow up the patients were evaluated as per the complaints (e.g.,UGI endoscopy if the patient complaints of dysphagia to rule out recurrence). The details of old cases are collected from the case sheets in the medical records department.

RESULTS



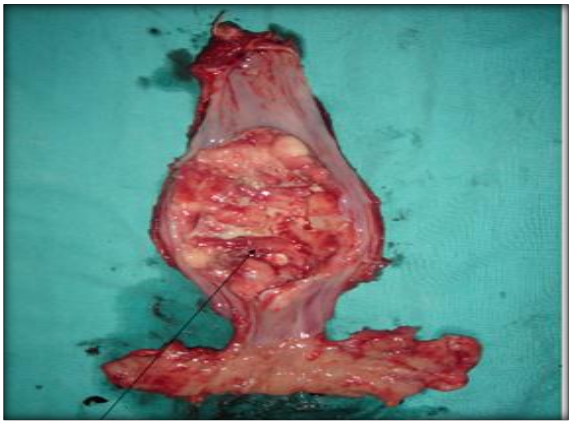
Making Of Gastric Conduit



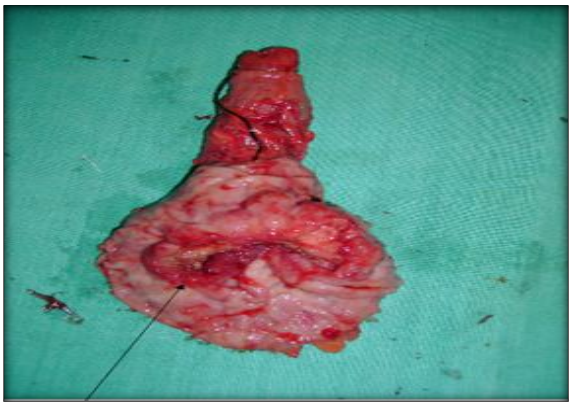
Gastric conduit

Esophago Gastric anastomosis in neck

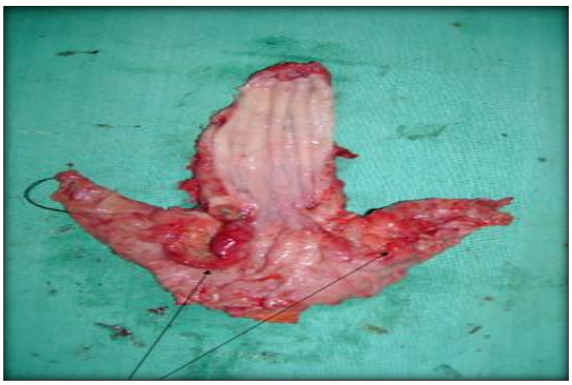
Pyloroplasty



Resected Specimen Showing Growth In Middle And Lower Thirds Of Esophagus



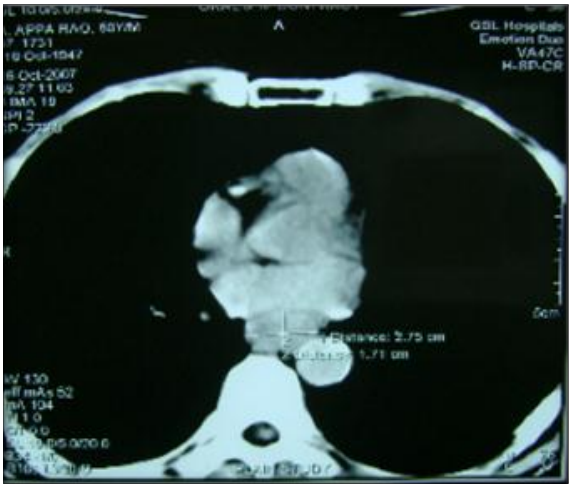
Resected specimen showing the growth at GEJ



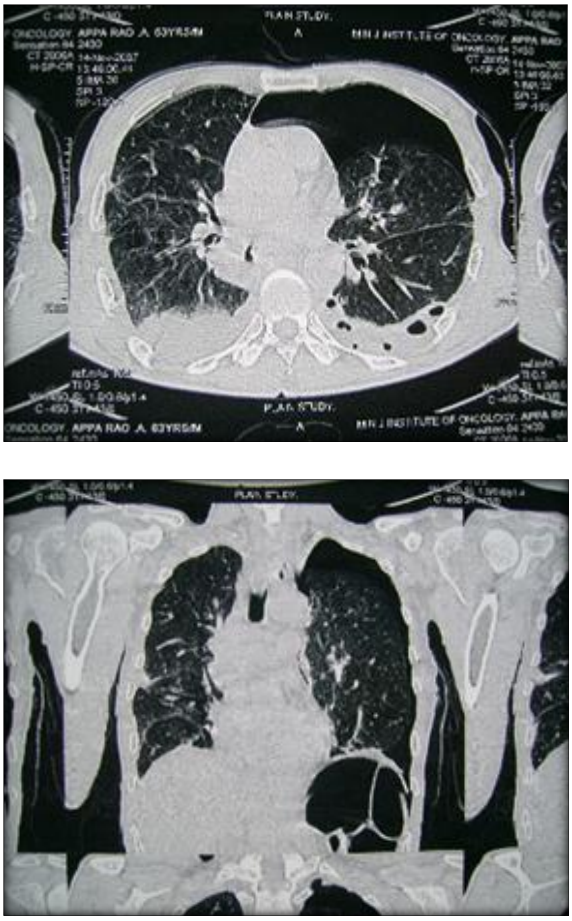
Resected specimen(cut opened) showing the growth at GEJ

Uncomplicated eck Wound With CRD

Barium swallow showing filling defect in lower end of esophagus with shouldering and dilatation proximally



CT scan showing lesion in esophagus



CT scan showing pneumothorax and Plural effusion in a post operative case

Most Common Age Group 41 – 60 yr (64% of cases) Mean Age: 50yrs . Both sex are almost equal in number. [Table 1] Dysphagia is the common presenting symptom. Most of the patients presented with grade 3 or 4 dysphagia (app. 70%) i.e., only after they are unable to take solid food they present to the doctor. In other words the lesion has developed to the extent of causing partial obstruction to food passage. Vomiting and loss of weight are the common symptoms after dysphagia. Risk factors are present in 32 patients Most of them are males. Tobacco and alcohol intake are the risk factors present in males (app. 65%) No significant risk factors can be elicited in females.

On examination anaemia was present in 24 cases. Systemic examination was with in normal limits. Routine investigations were normal in all cases except low Hb in 24 cases (26.96 %) and Hypoprotienemia in 9 cases (10.11%) Most common Blood Group B+ UGI endoscopy was done in all cases. It showed the location and appearance of lesions and biopsy was done in all cases. The reports were analysed. [Table 2]

Ulcerative lesions were common followed by polypoidal an Fungating lesions. Lesions were more common in lower 1/3 of esophagus.

Chest X ray: Normal in all cases except in 3 cases showing fibrotic changes confined to apical areas suggestive of old Koch's. Contrast swallow done in 22 of 89 cases. Showed lesion in all cases

USG Abdomen: Normal in all cases except in one showing renal cyst and prostatomegaly in two cases

CT Scan was done in 40 cases. Showed the lesion in all cases including lymph node status

Preoperative Radiotherapy H/O RT in 3 cases Preoperative Chemotherapy: H/O 1 cycle of CT in 1 case.

Surgical approach was transhiatal in 86 patients Transthoracic in 3 cases. Showed a lesion in all cases. Palpable lymphnodes in 37 cases.

Tranhiatal oesophagectomy with gastric pull up with esophagogastric anastomoses was done in 76 cases. Tranhiatal oesophagectomy with gastric pull up with esophagogastric anastomosis and splenectomy was done in 3 cases. Transhiatal esophago & partial gastrectomy was done in 4 cases. Laproscopic evaluation followed by Transhiatal oesophagectomy with gastric pull up with esophagogastric anatamosis was done in one case. Thoracoscopic evaluation followed by Tranhiatal oesophagectomy with gastric pull up with esophagogastric anatamosis was done in one case. combined thoracoscopy and laparoscopic esophagectomy was done in one case. Trans thoracic esophagectomy was done in three cases of which 2 were Mc kewon and one was Ivor Lewis. Esophagus is replaced by stomach based on Right gastric and right gastroepiploic artery in all cases. Route for the gastric pullup is posterior Mediastinum in all cases.

Anastomoses done with 2-0 silk, hand sewen, single layer, interrupted. Feeding Jejunostomy was done in all cases. ICD was placed bilaterally in all cases. Pyloromyotomy in 10 cases ; Pyloroplasty in 79 cases None of the cases that were approached trans hiatal route needed conversion to thoracotomy. Duration of surgery average 4 1⁄2 hours. Average intra operative blood loss: between 400 – 700 ml. Intra Operative Complications. Major Vessel Injury (IJV) occurred in one case which was ligated. Trachea injury occurred in one case which was repaired. Spleen injury occurred in 3 cases for which splenectomy were done. [Table 3]

All patients were managed in Propped up position. Chest physiotherapy (steam inhalation, incentive spirometer, etc) was implemented Jejunostomy Feeds started between 3 – 7 days (average 4.25 days). Oral Feeds started between 8 – 20 days (average 14.36 days)

ICD removal depending on the case between 4 – 10 days.

Suture removal was carried out between 10 – 14 days. [Table 4]

Wound infection occurred in 4 patients which wad managed conservatively Leak noticed in 19 cases. In 8 patients only leak is a complication. Remaining 11 patients have other complications. All were managed conservatively out of which 5 died because of associated complications.

Respiratory complications: 19 patients developed respiratory complications out of which three patients have more than one respiratory complication. Two

developed Atelectasis. Seven patients developed Pleural Effusion. One developed Empyema. Four developed Pneumothorax and/or Hydro Pneumothorax. Five developed Pneumonia. And three developed ARDS. All patients were managed aggressively in Intensive care unit with antibiotics, ICD placement and chest physiotherapy. Five patients succumbed to death due to ARDS./Sepsis

Cardiovascular complications: Two patients suffered from Post operative Myocardial Infraction and succumbed to death. One patient developed burst abdomen followed by ARF and subsequently died. One patient developed ileus and died of other co morbid complications. One patient developed Biliary Peritonitis for which re exploration and procedure was done. Nine patients developed Sepsis.

Pulmonary complications (24.71%) and leaks (21.34%) were the commonest complications.

Overall morbidity was 46% (as one patient may have more than one complication) and it is 33% if minor wound complications were excluded.

Reports of the patients were analyzed of which 55 were found to be Squamous cell carcinoma, 29 were found to be Adeno carcinoma., 2 Adenosquamous , 1 malignant melanoma and another 1 pleomorphic sarcoma;1 case, post RT, there is no evidence of malignancy.

In 5 cases resected margins were found to be positive for tumor invasion(R1) In 45 cases Lymph nodes were positive for malignancy.

Patients with positive Lymph nodes and those with residual tumor were subjected to Chemo-Radiation. [Table 5]

Squamous Cell Carcinoma Is the Commenest malignancy. Based on the histopathology reports and applying TNM classification the disease was staged in all patients as applicable. [Table 6]

Stage II (60%) has the more prevalence among the study group. Fifteen patients died post operatively. Out of which three died of ARDS, two died of Myocardial Infarction, nine died of Sepsis and one due to Post Operative ARF. [Table 7]

Sepsis is the most common cause of death. Overall mortality rate is 16.85%.

31 cases came for regular follow up. 58 cases lost for follow up. One patient presented with sub acute intestinal obstruction which was relieved conservatively. 10 patients were doing well. 4 patients have functional problems like regurgitation. 8 patients presented with anastamotic narrowing for whom dilatation was advised. 4 patients presented with biopsy proven recurrences these patients were transferred to palliative care. 4 patients developed metastasis to the bone and 2 developed lymph node metastasis for who external Radiotherapy was advised. One had liver metastasis. [Table 8]

Table 1: Demographic distribution in patients

Age group	Number of patients	Percentage
21-30	6	06.74%
31-40	13	14.60%
41-50	36	40.44%
51-60	21	23.59%
61-70	12	13.48%
71-80	1	01.12%
Gender		
Males	46	51.68%
Females	43	48.31%
Presenting symptom		
Dysphagia	85	95.50%
Pain Abdomen& Vomiting	3	3.37%
Regurgitation	1	01.12%
Duration of Dysphagia		
< 1 month	24	28.23%
1 - 3 month	37	43.29%
3 – 6 month	20	23.52%
> 6 month	4	04.70%
Symptom		
Vomiting	30	33.70%
Loss of weight	29	32.58%
Loss of appetite	19	21.34%
Pain abdomen	9	10.11%
Odynophagia	3	03.37%
Haematemesis	3	03.37%
Cough	3	03.37%
Chest Pain	2	02.24%
Regurgitation	4	04.49%
Back Ache	1	01.12%

Table 2: Risk Factor Analysis in Males

Risk factor	Male patients (total 46)	Percentage
Smoking	9	19.5%
Drinking alcohol	4	8.69%
Smoking + alcohol intake	14	30.43%

Tobacco chewing	3	6.52%
No risk factor	16	34.78%

Table 3: Analysis of UGI endoscopy findings

Variable	Number	Percentage
UGI endoscopy location		
Upper1/3	0	0%
Middle1/3	10	11.23%
Lower1/3	67	75.28%
GEJ	12	13.48%
UGI endoscopy apperance		
Ulcerative	58	65.16%
Fungating	16	17.97%
Polyploidal	19	21.34%
Stricture	6	06.74%

Table 4: Intra operative complications (5.6%)

Complication	No. Of patients	Percentage
Major Vessel Injury(IJV)	1	01.12%
RLN injury	0	0%
Trachea injury	1	1.12%
Thoracic Duct injury	0	0%
Spleen injury	3	3.37%
Intra operative Hypotension	0	0%
TOTAL	5	5.61%

Table 5: Post-operative complications

Complications	Number of patients	Percentage
Wound complications	23	25.84%
Wound Infection	4	04.49%
Leak	19	21.34%
Cardiovascular complications	2	02.24%
Myocardial Infaction	2	02.24%
Pulmonary complications	22	24.71%
ARDS	3	03.37%
Atelectasis	2	02.24%
Pleural Effusion	7	07.86%
Empyema	1	01.12%
Pneumothorax/HydroPneumothorax	4	04.49%
Pneumonia	5	05.61%
Others	--	--
Sepsis(Other than identified pulmonary causes)	5	05.61%
ARF	1	01.12%
Ileus	1	01.12%
Burst Abdomen	1	01.12%
BiliaryPeritonitis	1	01.12%
Total Morbidity	41	46%

Table 6: Histopathological types

Histopathology	Number of patients	Percentage
Squamous cell carcinoma	55	61.27%
Adeno carcinoma	29	32.58%
Adeno squamous	2	02.24%
Malignant melanoma	1	01.12%
Pleomorphic sarcoma	1	01.12%
No evidence of	1	01.12%

Table 7: Pathological staging

Stage	No. of patients	Percentage (as for 86 cases)
I	2	2.32%
IIa	38	44.18%
IIb	14	16.27%
III	31	36.04%
IV	1	1.16%

Table 8: Causes of mortality

Cause	Number of Patients	Percentage
SEPSIS	9	10.11%
ARDS	3	03.37%
MI	2	02.24%

ARF	1	01.12%
TOTAL	15	16.85%

DISCUSSION

The incidence of esophageal carcinoma increases with age with a median age of diagnosis of 55 – 60 yrs.[3] According to an Indian study by Chitra S. et al esophageal carcinoma is seen in the 5th or 6th decade of life.[4] According to the present study the mean age group of patients is 41-60 yrs (64%).

The incidence of esophageal carcinoma has a striking male predominance.[3] In the present study since only operable cases were taken into consideration the distribution in both the sexes is almost equal. Smoking and drinking are independent contributing factors for carcinoma esophagus.[5] In the present study also the same risk factors are implicated. According to Hiwa Omer Ahmed. et al,[6] dysphagia is the commonest presenting symptom (90 -95%), in the present study also dysphagia is the presenting symptom in 95.50%. of patients. Most of the patients presented with grade 3 or 4 dysphagia (app. 70%) i.e., only after they are unable to take solid food they present to the doctor. In other words the lesion has developed to the extent of causing partial obstruction to food passage. According Hiwa Omer Ahmed et al,[6] the incidence of different symptoms are dysphagia (90 -95%) weight loss (40 – 60%), vomiting (30-45%). In the present study dysphagia is present in 95.50%, weight loss occurred in 32.58%, vomiting in 33.70% of patients. According to Sami et al,[7] the esophageal carcinoma present as Polyploidal (Fungating and protruded) growths in 60 %, ulcerative (excavated) in 25 % and stenosing (scirrhous, flat, diffuse, infiltrative) in 15%. In the present study Ulcerative growths were seen in 65.16% of cases; fungating in 17.97%, polyploidal in 21.34%, together 39.31% and Stricture in 06.74%. This may be due to the fact that only operated cases were studied. According to location the incidence of esophageal carcinoma is cervical 8%, upper one third 3%, middle one third 32%, lower one third 25%, and gastro esophageal junction 32%. In the present study since only operable cases were taken into consideration the incidence according to location is upper one third 0%, middle one third 11.23%, lower one third 75.28%, gastro esophageal junction 13.48%. According to Malkan G Mohan Das,[8] in India Squamous cell carcinoma is more common. In the present study also Squamous Cell Carcinoma is much more predominat than the other variety, the incidence of Squamous Cell Carcinoma is 61.79%, Adeno Carcinoma is 32.58%, Adeno Squamous Carcinoma is 02.24%, Malignant Melanoma is 01.12% and Pleomorphic Sacroma 01.12%.

In the present study all patients except 3 underwent trans hiatal esophagectomy followed by gastric pull up through posterior mediastinum and cervical esophago gastric anastomosis was done. In the present study there was no need for additional thoracotomy. The intra operative complications rate was 5.61% In a study done by Mark B Orringer et al (2001),[9] the incidence of cervical leak after THE was 13%. In the present study the incidence of leak was 21.34%. All the cases were managed by opening the cervical wound and packing. In a study conducted Mark B Orringer et al.[9] the incidence of pulmonary complications was 2%. But in other studies Obertop,[10] (23%) Portale G et al,[11] (23%) Cariati et al,[12] (42%) it was more. In the present study the value is 24.71%

In the present study there was no recurrent laryngeal nerve injury or injury to thoracic duct or post-operative chylothorax. In a study conducted by Orringer et al,[9] the mortality rate was 4%. But in other studies [Cariati et al,[12] (16%)] it was more. In the present study the mortality rate was high (16%) probably due to poor nutritional status due to poor socio economic status, late presentation and associated medical co morbidities. It can also be due to disparity in sample size and characteristics.

The morbidity and mortality of this study was compared with previous studies in literature.[13] In the present study 60% of the cases are of Stage II and 36% were stage III. It indirectly shows that as the stage advances the chances of operability decreases as only operable cases were studied in this study. In the present study the survival rate and post esophagectomy quality of life could not be assessed due to poor patient follow-up.

CONCLUSION

The conclusions are as Squamous cell carcinoma is the commonest esophageal malignancy in India. Squamous cell carcinoma is still the most common malignancy in the lower 1/3 of esophagus. Most of the patients were between 41-60 yrs (64%). Smoking and alcohol are the most common risk factors in males (65%). Dysphagia is the most common presenting symptom. Most of the lesions were in the form of ulcerated growths (65%). Intraoperative complications were 5.61%. Anastomotic leak (21%) and the pulmonary complications (24%) were the most common complications. These two were also the most common associated factors with mortality which was 16.85%. Esophageal carcinoma can be managed surgically with reasonable morbidity and mortality if the patient presents early.

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