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Smoking and alcohol increase post operative complication rate in esophageal cancers - Experience of 150 Esophageal cancer cases at a tertiary cancer care centre.

Oncology

KEYWORDS: Smoking, Alcohol, Esophageal Cancer, postoperative complication, Health care cost

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ABSTRACT

Introduction: Smoking and alcoholism has been associated for decades with esophageal cancers. They are not only etiologically associated with esophageal cancers but cause significant postoperative morbidities.

Material and Methods: 150 consecutive esophageal surgeries over a period of 3 years were assessed. Immediate and delayed post surgical complications were compared with patient characteristics, tumor characteristics, type of surgery and type of anastomosis. Relationship of immediate postoperative complications with postoperative anastomotic site stricture and recurrence were also assessed.

Results: Of all the above characteristics only smoking (p-0.007, Odds ratio-3.17), alcoholism (p-0.003, Odds Ratio-4.17) and days of stay in the postoperative period (p-0.000) were significantly associated with immediate post operative complications.None of the patient, tumor characteristics or surgical techniques though important were statistically associated with post operative complications.

Discussion: Chronic smoking and alcoholism not only carry a high risk of developing esophageal cancer but also associated with significant post operative complications which indirectly increases significant post operative days of stay in the hospital and hence the health care cost burden.

Conclusion: Esophageal cancer surgery is a complex procedure with multiple factors associated with its increased rate of morbidity in the post operative period. However various health care measures like cessation of smoking and alcohol prior to surgery might mitigate the complication rates apart from good surgical techniques and critical care.

Introduction:

Incidence of esophageal cancer has been increasing. It is one of the least studied and deadliest cancers worldwide because of its extremely aggressive nature and poor survival rate. It ranks sixth among all cancers in mortality.[1] Smoking and alcoholism has been associated for decades with esophageal cancers. They are not only etiologically associated with esophageal cancers but cause significant postoperative morbidities.[2]

Surgical resection has been the mainstay of operable esophageal cancer however it is a complex procedure with morbidity and mortality rates 23-50% and 2-8% respectively and 9-29% and 2-4% respectively in China where the incidence is highest however not much data is available from the Indian subcontinent.[3]

Mortality associated with surgeries for esophageal cancer have declined in the recent years due to progress in various techniques, surgical skill, perioperative management and improvement in anesthesia and critical care. Even though many of the complications associated with such a major surgery are not fatal, esophageal cancer surgeries continue to remain a morbid procedure. At our Institute we have tried to assess the factors associated with complications following 150 esophageal surgeries for esophageal cancer.

Material and Methods:

150 consecutive esophageal surgeries over a period of 3 years were assessed. Immediate and delayed post surgical complications were compared with patient characteristics like age, gender, addiction i.e. smoking, alcohol, TNM Staging, tumor characteristics like site, histology type, grade and length, type of surgery- Transthoracic versus transhiatal esophagectomy, R status, type of anastomosis- Handsewn or stapled and post operative days of stay in the hospital. Relationship of immediate postoperative complications with postoperative anastomotic site stricture and recurrence were also assessed. Statistical analysis was carried out using Chi-Square test and Fischer exact test using Statistical package 'R' version 2.15.2.

Results:

Patient Characteristics :

Of the 150 patients 90 (60%) were male and 60 female (40%). 109 (72.6%) patients were below 60 years and 41 (27.4%) above 60 years. 104 (69.3%) patients presented with dysphagia less than 2 months. 37 (24.7%) patients were chronic smokers and 19 (12.7%) were chronic alcoholic. (Table 1)

Tumor Characteristics:

On esophagogastroduodenoscopy (OGDscopy) 43 patients (28.6%), 67 patients(44.6%) and 40 patients (26.6%) were found to have lesion in middle 1/3, lower 1/3 and esophagogastric junction (EGJ) respectively. 126 (84%) were squamous cell carcinoma) whereas 24 (16%) were adenocarcinoma with grades 1,2,3 being in 7 patients (4.7%), 76 patients (50.7%) and 67 patients (44.7%) respectively. Only 8 patients(5.3%) had lymphovascular emboli. 6 (4%), 36 (24%), 97 (64%) and 11 (7.3%) patients had T1, T2, T3 and T4 disease respectively whereas 75 (50%), 39 (26%), 26 (17.3%) and 10 (6.7%) patients had N0, N1, N2 and N3 Nodal disease as per AJCC 7th TNM Staging. (Table 2)

Surgical Methods:
130 (86.7%) patients underwent Transhiatal Esophagectomy whereas 20 patients (13.3%) had Transthoracic Esophagectomy. In 140 patients (93.3%) handsewn anastomosis was performed while other 10 patients had stapler neck anastomosis.. 132 patients (88%) underwent R0 resection while rest 18 (12%) had R1 resection.(Table 3)

Complications:
Respiratory complications were most common with 25 patients (16.6%) having atelectasis or pneumonia followed by neck anastomosis leak in 11 patients (7.3%) and wound infection and chylothorax in 2 and 1 patient respectively.91 patients (60.6%) were discharged in less than 10 postoperative days whereas 59 (39.33%) patients required hospitalization for more than 10 days. (Table 3)

34 patients (22.8%) had anastomostic stricture while 15 patients presented with anastomotic site recurrence on 18 months of follow up. (Table 3)

Of all the above characteristics only smoking (p-0.007, Odds ratio-3.17), alcoholism (p-0.003, Odds Ratio-4.17) and days of stay in the postoperative period (p-0.000) were significantly associated with immediate post operative complications.

Table 1: Analysis of patient characteristics with post operative complication.

Patient Characteristics	Postoperative complications		p Value
	Yes	No	
Gender	25	65	0.167
M	10	50	
F			
Age	27	82	0.665
<60 years	8	33	
>60 years			
Dysphagia	24	80	1.000
<2 months	11	35	
>2months			
Smoking	15	22	0.007
Yes	20	93	
No			
Alcohol	10	9	0.003
Yes	25	106	
No			

Table 2: Analysis of Tumor characteristics with postoperative complication.

Tumor Characteristics	Postoperative complications		p Value
	Yes	No	
Level of Lesion			0.333
Middle 1/3	7	36	
Lower 1/3	16	51	
EGJ	12	28	
Histopathology			0.797
SCC	29	97	
Adenocarcinoma	6	18	
Lymphovascular embolisation			0.390
Yes	3	5	
No	32	110	
pT			0.633
T1	2	4	
T2	6	30	
T3	25	72	
T4	2	9	
pN			0.231
N0	14	61	
N1	9	30	
N2	10	16	
N3	2	8	

Table 3: Relationship of Surgical techniques, Days of stay and anastomotic site stricture and recurrence with postoperative complication.

Surgical Methods and other parameters	Postoperative complications		p Value
	Yes	No	
THE	31	99	1.000
TTE	4	16	
Anastomosis	33	107	1.000
Handsewn	2	8	
Stapler			
Resection	30	102	0.766
R0	5	13	
R1			
Days of Stay	12	79	0.000
<10 days	23	36	
>10 days			
Anastomotic Site Stricture	7	27	0.819
Yes	28	87	
No			
Recurrence	3	12	1.000
Yes	32	103	
No			

Discussion:
Operative morbidity in patients undergoing esophageal resection occurs in upto 50% patients.[4] We experienced 23.3% perioperative morbidity at our centre that were related to complications such as respiratory, anastomotic leak, chylothorax and wound infections. This decreased morbidity and mortality can be attributed to high volume of patients and experienced Thoracic surgeons and critical care team at our centre.

Post operative complications in our series were significantly associated with increased duration of hospital stay.Longfei et al suggested that prolonged postoperative length of stay is associated with poor overall survival after esophagectomy in esophageal cancer patients. We saw increased rates of remote complications such a stricture formation and anastomotic site recurrence however it could not reach statistical significance.[5]

Smoking has been identified as one of the major risk factors for both etiology and pulmonary complications associated with esophageal cancer and esophagectomy respectively.[6]

Our series shows a significant association with postoperative complications in patients with history of both smoking and alcoholism. Effects of both is synergistic or mutually exclusive is yet to be known. However we could not quantify the years of cigarette smoking and alcoholism that would have given us better insight into its effects on pulmonary complications.

Many other parameters were taken into consideration for evaluation against complication rate like Transthoracic Esophagectomy (TTE) versus Transhiatal Esophagectomy (THE), TNM staging of the disease, Handsewn versus Stapler anastomosis, R0 versus R1 resection, anatomical level of lesion, histopathology but none of them could reach statistical significance.

Chronic smoking and alcoholism not only carry a high risk of developing esophageal cancer but also associated with significant post operative complications which indirectly increases significant post operative days of stay in the hospital and hence the health care cost burden.

Conclusion:
Esophageal cancer surgery is a complex procedure with multiple factors associated with its increased rate of morbidity in the post operative period. However various health care measures like

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cessation of smoking and alcohol prior to surgery might mitigate the complication rates apart from good surgical techniques and critical care.

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Conflict of Interest: Authors report no conflict of interest. All the authors have equally contributed to the work.

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