

*“Incidence of carcinoma of esophagus in cases of dysphagia
undergoing upper GI endoscopy in Coimbatore Medical College and
Hospital”*

Dissertation submitted to
TamilNadu M G R Medical University
Chennai 600032, April 2014



In partial fulfillment of the
Regulation of the award of
M.S.DEGREE IN GENERAL SURGERY



Department of General Surgery
Coimbatore Medical College and Hospital
Coimbatore – 641018

CERTIFICATE

This is to certify that the dissertation entitled “*incidence of carcinoma of esophagus in cases of dysphagia, undergoing upper GI endoscopy in Coimbatore Medical College and Hospital*” submitted to the Tamil Nadu Dr M.G.R. Medical University, Chennai 600032, in partial fulfillment of the University regulation for award of M.S. Degree in General Surgery is bonafied work done by Dr. Jayaprakash.V post graduate student in General Surgery under my direct supervision and guidance, during the period November 2012 to October 2013.

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ESOPHAGUS IN CASES OF DYSPHAGIA
UNDERGOING UPPER GI ENDOSCOPY
IN CMCH.

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I hereby declare that the dissertation entitled “*incidence of carcinoma of esophagus in cases of dysphagia undergoing upper GI endoscopy in Coimbatore Medical College and Hospital*” was done by me at Coimbatore Medical College Hospital, Coimbatore 641018, during the period of my post graduate study for M.S. Degree Branch 1 (General Surgery) from 2011 to 2014.

This dissertation is submitted to the Tamil Nadu Dr M.G.R. Medical University in partial fulfillment of the University regulation for award of M.S. Degree in General Surgery.

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*“Incidence of carcinoma of esophagus in cases of dysphagia
undergoing upper GI endoscopy in Coimbatore Medical College and
Hospital”*

ABSTRACT

Background: In India, squamous cell carcinoma of the esophagus was common and it commonly found in males in the age group of >50 years. Dysphagia was the commonest complaint.

Aim: Aim of this study was to determine the presence of carcinoma in patients with complaints of dysphagia, and also to find out common location, histological types and grading.

Method: A prospective study in patient with complaints of dysphagia who were undergoing upper GI endoscopy in Coimbatore medical college and hospital (deparment of General surgery) conducted over a period of 12 months from november 2012 to oct 2013. Biopsy specimen processed and reported in pathology deparment and histopathological confirmation done.

Results: out of 50 patients of dysphagia who were undergone upper GI endoscopy in Coimbatore medical college Hospital, 16 patients found to be having carcinoma of esophagus

Squamous cell carcinoma was the most common histological type, seen in 15 (93.75%) out of 16 cases. 1 patients (6.25%) had adenocarcinoma. Most of them (12/16) are with moderately differentiated histological grading of tumor. In our study series, out of 16 cases of carcinoma of esophagus 12(75%) were male and 4(25%) were females. Carcinoma of esophagus commonly presented in middle one third of esophagus. It was about 9(56.25) out of 16 cases were found in middle one third. Most common age groups involved were more than 50 years of age. 13(81.25%) out of 16 cases were above 50 years.

Conclusion: carcinoma of esophagus is the most important cause of dysphagia which should be diagnosed earlier. Males are more commonly affected than females, because of smoking, alcoholism and GERD. Patients with age of more than 50 are found to be affected by carcinoma of esophagus. Squamous cell carcinoma is more common than adenocarcinoma in our study and middle third of esophagus is commonly involved. Regarding histological grading moderately differentiated tumors are common.

Key words : esophagus- carcinoma- dysphagia –endoscopy.

INTRODUCTION

INTRODUCTION

Number of patients with ill look and complaint of difficulty in swallowing are increasing in OPD. When they are investigated and diagnosed as carcinoma of esophagus, it is more worrying to the treating doctor than the patient by knowing that the patient had already passed the stages of curability. Case load either newly diagnosed or referred from other centers are in ascending curve in recent years.

Aim of this study is to find out the incidence of carcinoma of esophagus in patients with complaints of dysphagia undergoing upper GI endoscopy in general surgery Department of Coimbatore Medical college Hospital. Squamous cell carcinoma and adeno carcinoma is the common type carcinoma esophagus seen in Coimbatore Medical College Hospital. The endoscopic biopsy is processed and reported from Department of pathology in Coimbatore Medical College Hospital.

AIM AND OBJECTIVES

AIM AND OBJECTIVES

The main aim of this study is to find out the incidence of carcinoma esophagus in patients coming with complaints of difficulty in swallowing. Upper GI endoscopy used as a diagnostic tool and histopathological examination of the biopsy specimen done.

OBJECTIVES

Primary objectives

1. To find out the incidence of carcinoma of esophagus in cases of dysphagia undergoing upper GI endoscopy in CMCH.(department of General surgery)
2. To find out the probability of carcinoma of esophagus in dysphagia.

Secondary objectives

1. To find out the common anatomical location of carcinoma of esophagus in CMCH set up.
2. To find out common histological type and grading of the tumor in CMCH set up.

REVIEW OF LITERATURE

Review of literature

Carcinoma of esophagus is now considered as sixth most common malignancy of adults worldwide. Its increasing incidence and morbidity make it as one of the most important gastro intestinal disease.

Carcinoma of esophagus is commonly seen in so called Asian Cancer belt which extend from turkey, Caspian sea through north Iran, north Afghanistan, southern soviet union to china and India .

Its incidence is mounting up as high as to record 160/100000 in china and Africa, 540/100000 in Kazakhstan. In United States 5/100000 and in United Kingdom it is 10/100000. Carcinoma of esophagus accounts 4% of newly diagnosed cancer in North America. However in case of India, incidence rate widely varies state to state and it is highest in Kashmir and it is about 70/100000 here, in Mumbai it accounts 20/100000, whereas in Bangalore it is 11/100000.

Male female ratio is 3:1 for squamous cell carcinoma and 15:1 for adeno carcinoma. Carcinoma esophagus is most commonly seen in 5th to 6th decade of life. Peak mortality is in men between 60 and 70 years of age.

Adeno carcinoma is commonly found in whites, whereas squamous cell carcinoma is commonly found in African American men, and in developing countries.

In Coimbatore Medical College, out of 50 patients with complaints of dysphagia, 16 patients were found to have carcinoma of esophagus.

Anatomy of the esophagus

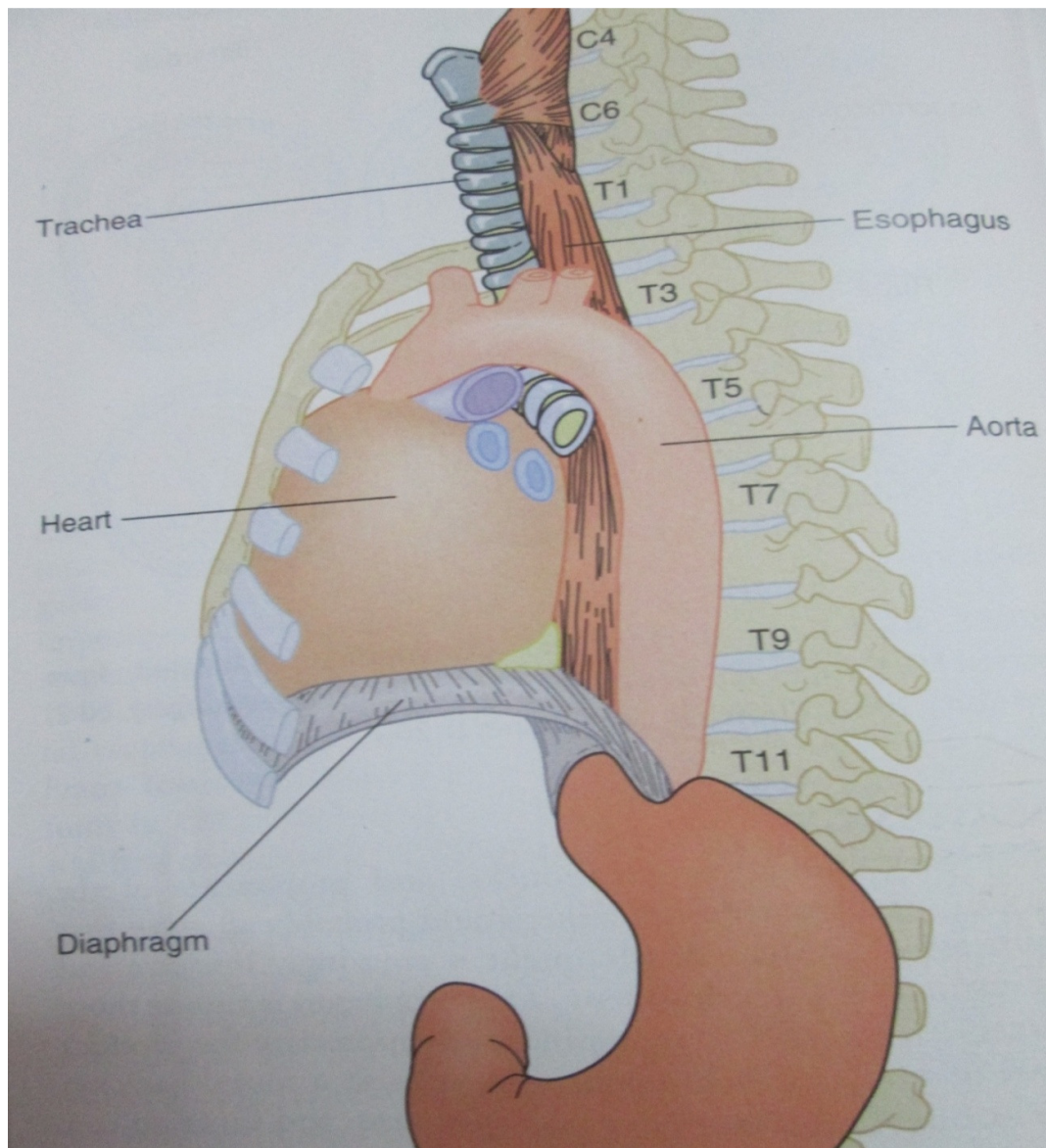
Esophagus is the muscular tube extends from the base of pharynx at C6 to cardia of the stomach at T11. It is about 25 to 30 cm length and average inner luminal diameter of 23 to 25 mm. It has got cervical, thoracic and abdominal part as it passes through above regions in its course. Total length of the esophagus also divided as upper, middle and lower third, 8 cm each, in surgical anatomy.

Cervical part- starts from cricopharyngeus and extend upto horizontal part of inferior constrictor muscle. Trachea and recurrent laryngeal nerve are the main structures related to cervical part. Thoracic part starts from right side but in lower part deviate to left side to continue as the abdominal part. It is related to azygos vein, thoracic duct, aorta, pleura and pericardium.

In neck and thorax it is related to vertebral column posteriorly and trachea anteriorly. At carina heart and pericardium are lie directly anterior

to thoracic esophagus. Upper esophageal sphincter and lower esophageal sphincter are the two high pressure zones in cranial and caudal part of esophagus respectively.

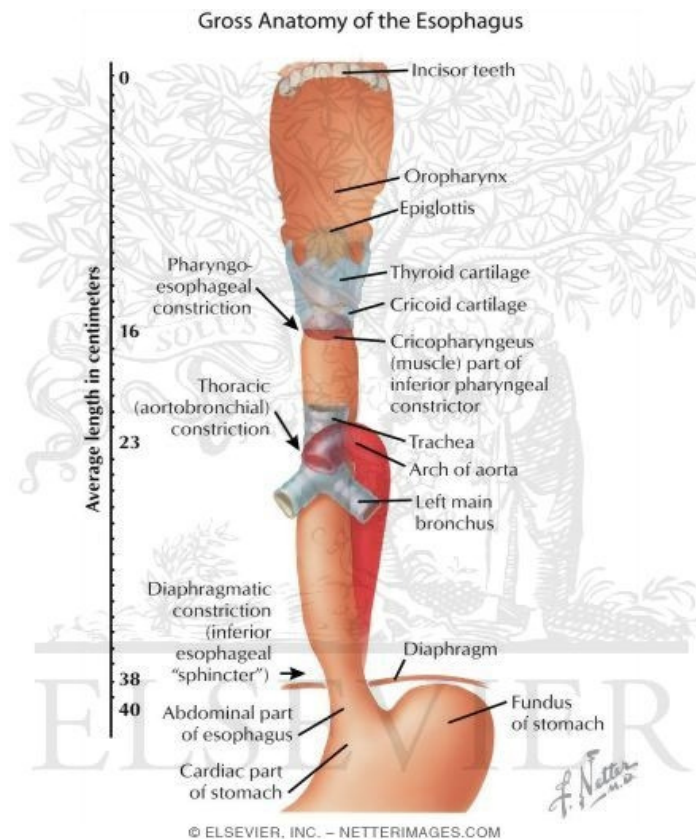
Esophagus enters the abdominal cavity through esophageal opening in diaphragm at the level of T10.



Esophagus has got three constrictions in its course. First one is the narrowest point is at cricopharynx. (14mm inner diameter). It is the narrowest part of Gastro intestinal tract and foreign body impaction is common here. It is Situated 15 cm from incisor.

Second constriction is broncho aortic constriction at the level of T4 makes narrowing of the esophageal lumen. It is Situated at 25th cm from incisor and also the commonest site of perforation during endoscopy.

Third constriction is diaphragmatic constriction present at the point where it enters the diaphragm at T10 level and 40 cm from incisor.



Blood supply of the esophagus

Cervical part of the esophagus is supplied by

- Inferior thyroid artery

Thoracic part of the esophagus is supplied by

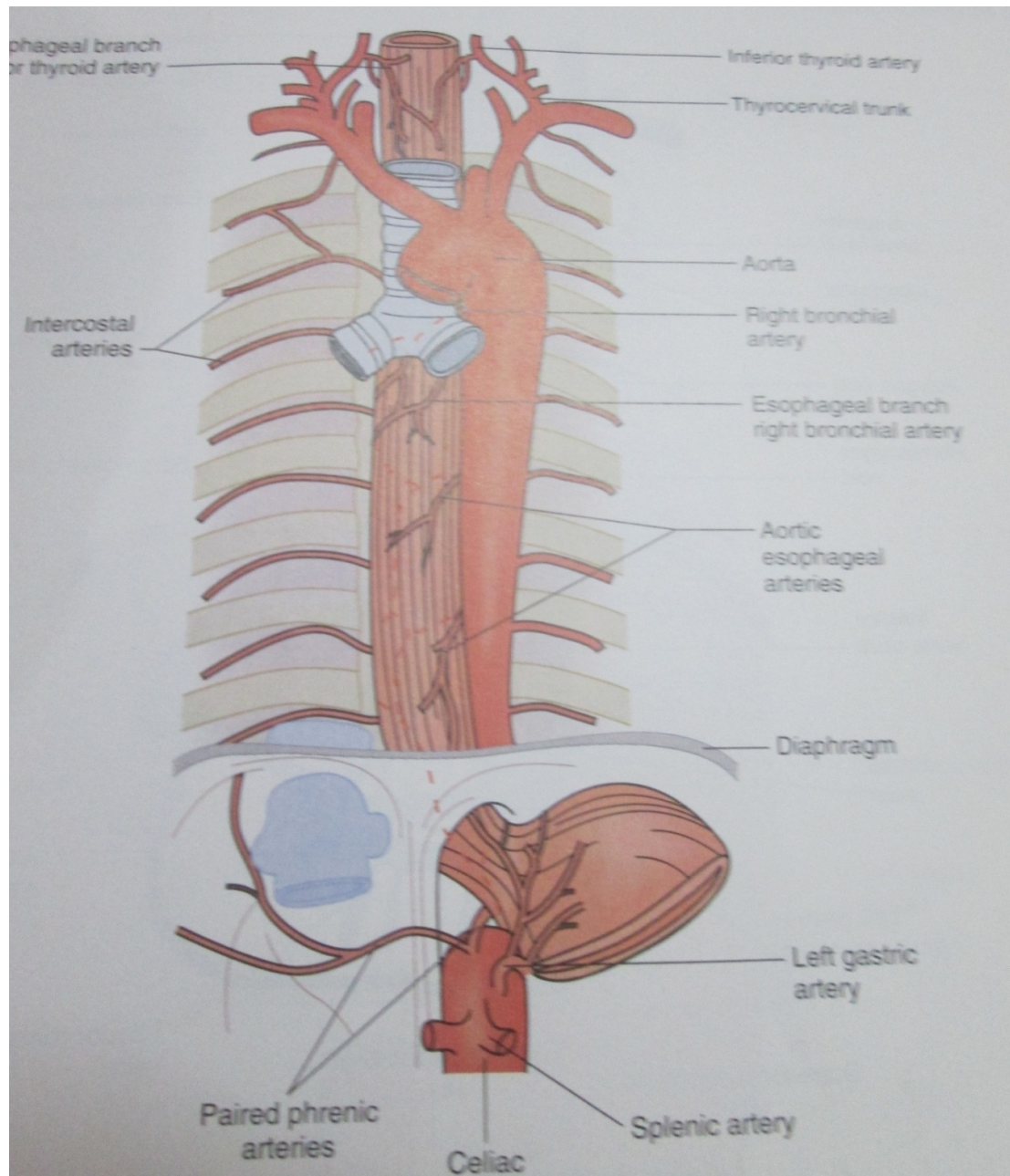
- 4 to 6 direct branches from the aorta.
- Esophageal branches from the bronchial arteries
- Supplementation from inferior thyroid artery, intercostals arteries and inferior phrenic arteries.

Abdominal part of the esophagus is supplied by

- Left gastric artery and Inferior phrenic artery

Esophageal branches in this part either arises from inferior phrenic or celiac trunk. All arteries form a capillary network continues for length of the esophagus within sub mucous layer.

ARTERIAL SUPPLY OF ESOPHAGUS



Venous drainage of esophagus

Submucous venous plexes which extending for whole length of the esophagus is first basin for venous drainage.

Cervical part of esophagus is drained by

- Inferior thyroid vein

Thoracic part of esophagus drained by

- Azygos vein in right side
- Hemiazygos vein in left side.

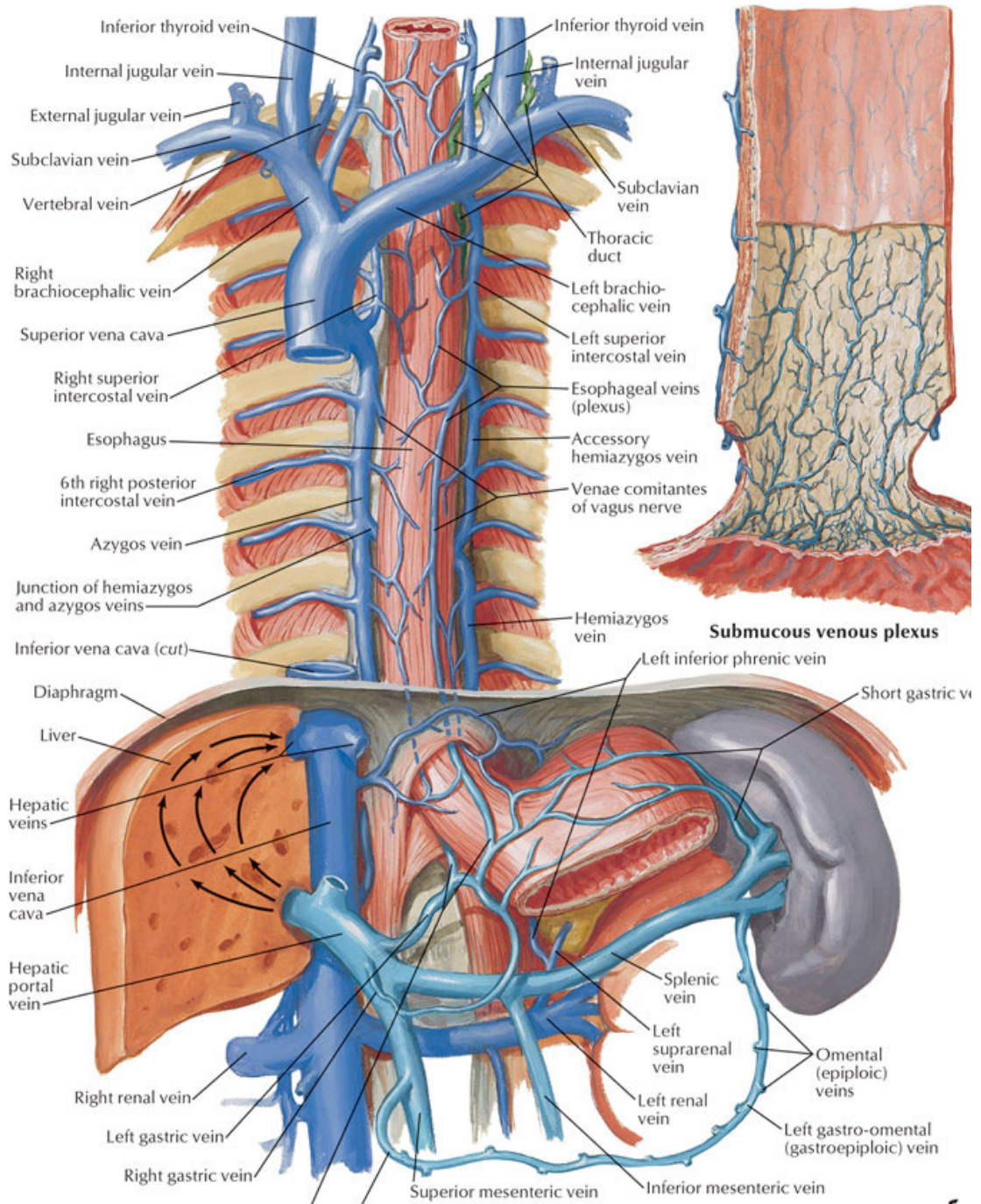
Abdominal part drained by

- Left and right phrenic veins (systemic)
- Left gastric and short gastric veins (portal)

Venous system of esophagus in its lower end is one of the junction of portal and systemic circulation. So it is the reason for esophageal varices whenever there is portal hypertension.

Occurrence of portal hypertension is 30% in cases of cirrhosis liver and 30% of them will bleed.

Venous drainage of esophagus



Lymphatic drainage of the esophagus

Interconnecting lymphatic plexus in submucous and muscular layer of esophagus drained into regional nodes. Because of the longitudinal arrangement of lymphatics, spread to the distant nodes occurs early in case of carcinoma of esophagus.

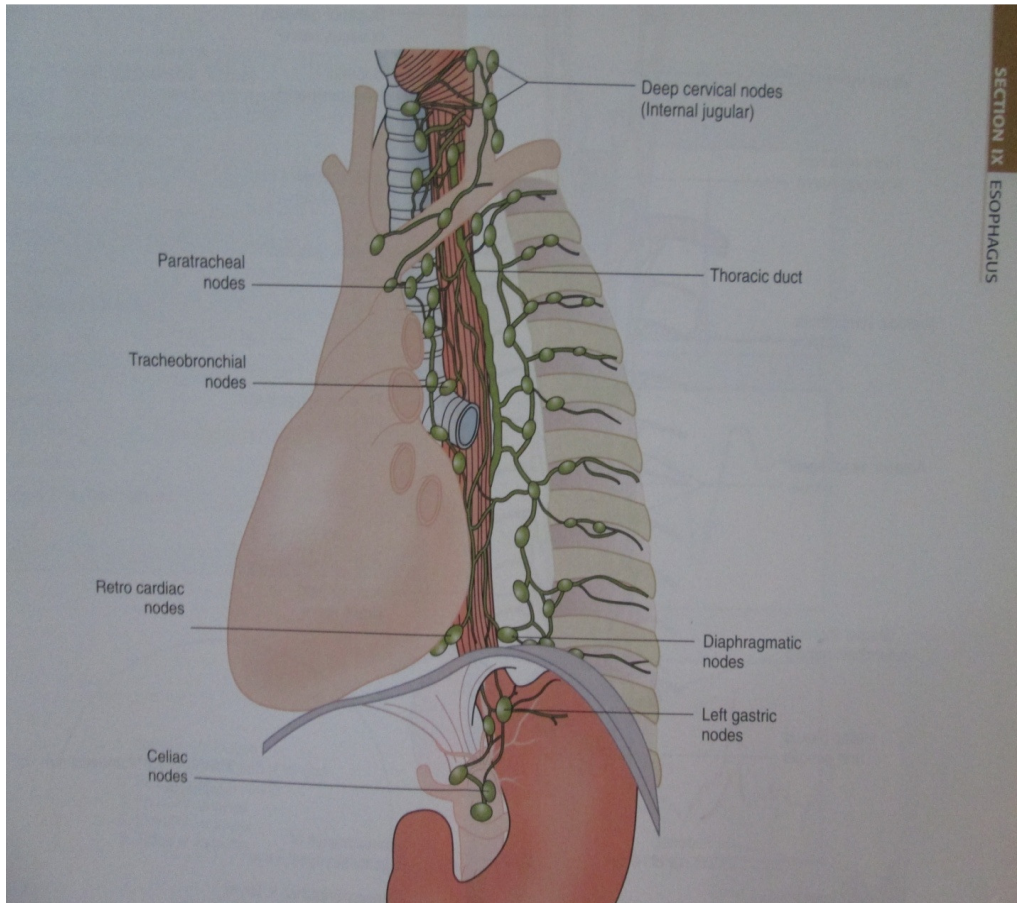
Cervical part of the esophagus drained into

- Paratracheal nodes (anteriorly)
- Deep cervical(laterally)
- Internal jugular (posteriorly)

Thoracic part of the esophagus drained by

- Mediastinal nodes
- Thoracic duct
- Paratracheal
- Subcapital
- Paraesophageal
- Retro cardiac
- Infra cardiac
- Para aortic nodes
- Inferior pulmonary ligament nodes

LYMPHATIC DRAINAGE OF THE ESOPHAGUS



Nerve supply of the esophagus

As in other parts of gastro intestinal tract autonomic nervous system provides nerve supply to esophagus for motility as well as secretory functions.

Sympatheic supply has inhibitory influence on motility and excitory influence on sphincters.

Cervical esophagus supplied by Superior ganglion of cervical sympathetic trunk.

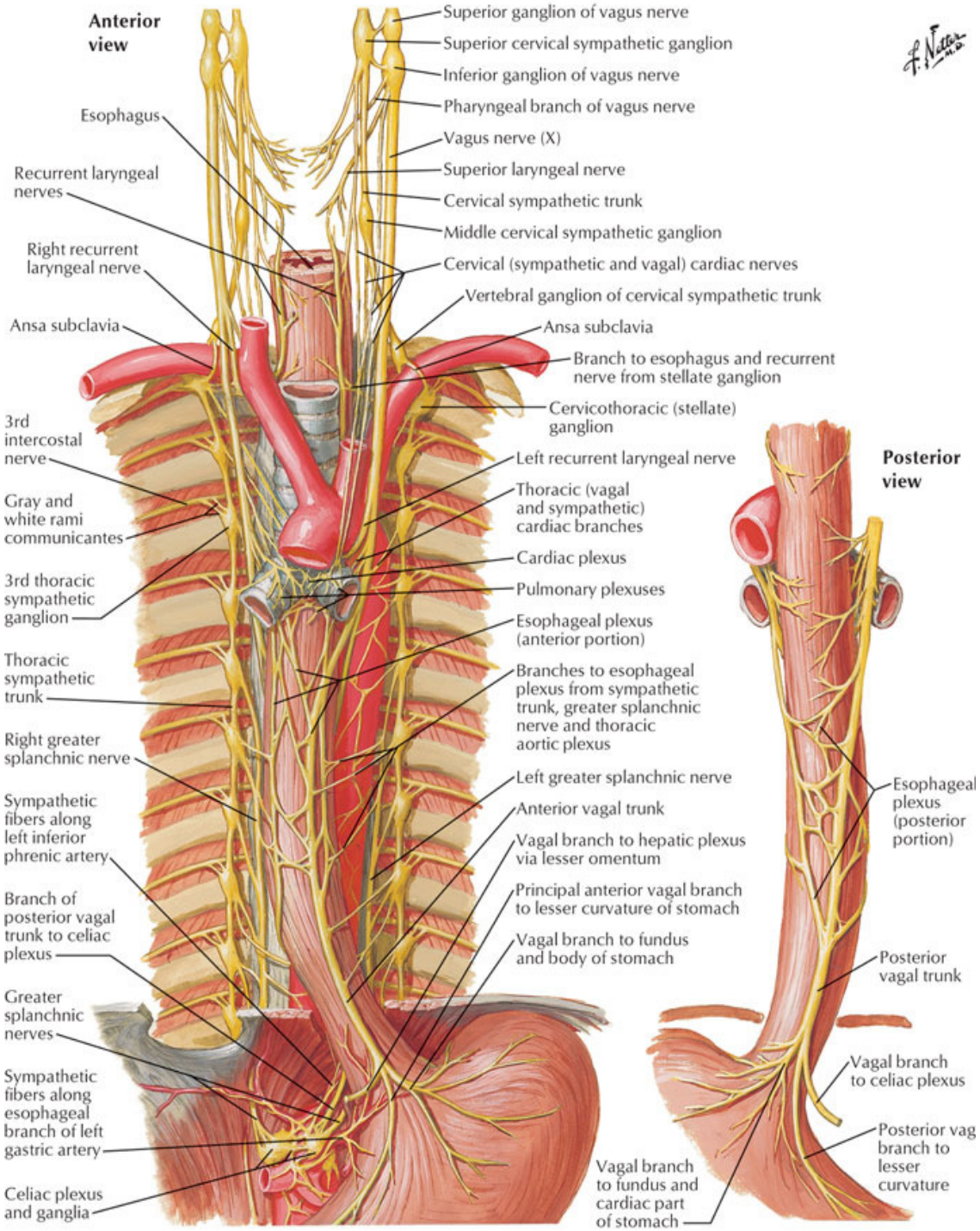
Thoracic part supplied by Stellate ganglion in upper part Great and lesser splancnic ganglion in lower part. Abdominal part supplied by Sympathetic fibers along the left gastric artery.

Parasympathetic

Vagus nerve is the parasympathetic component for motility and secretory functions. It has inhibitory effect on sphincters.

It forms two plexus of nerves known as Auerbach's plexus in muscular layer and Meissner's plexus in submucous layer, which is very sparse in esophagus comparing to remaining Gastro Intestinal Tract.

NERVE SUPPLY OF THE ESOPHAGUS



F. Netter

Histology of esophagus

Esophagus is mainly composed of muscular tissue.

Esophagus consists following layers from inside to out.

- Mucosa
- Basement membrane
- Lamina propria
- Muscularis mucosa
- Sub mucosa
- Muscularis propria
- Adventitial layer

Mucosal layer

It is the innermost layer of esophagus.

Lined by squamous epithelium except in distal 1 or 2 cm where it is replaced by transitional or junctional columnar cells at 'Z, line.

Epithelium, basement membrane, lamina propria and muscularis mucosa are the parts of mucosal layer.

Sub mucosa

Lies just deep to the mucosa and also Contains lymphatics, vascular structures, mucous glands and meissner's plexus of nerves.

Muscular layer

There are two layers, inner circular and outer longitudinal.

Both layers are striated in upper 1/3rd and smooth muscle in lower 2/3rd.

Circular muscles are extension of crico pharyngeus muscle.

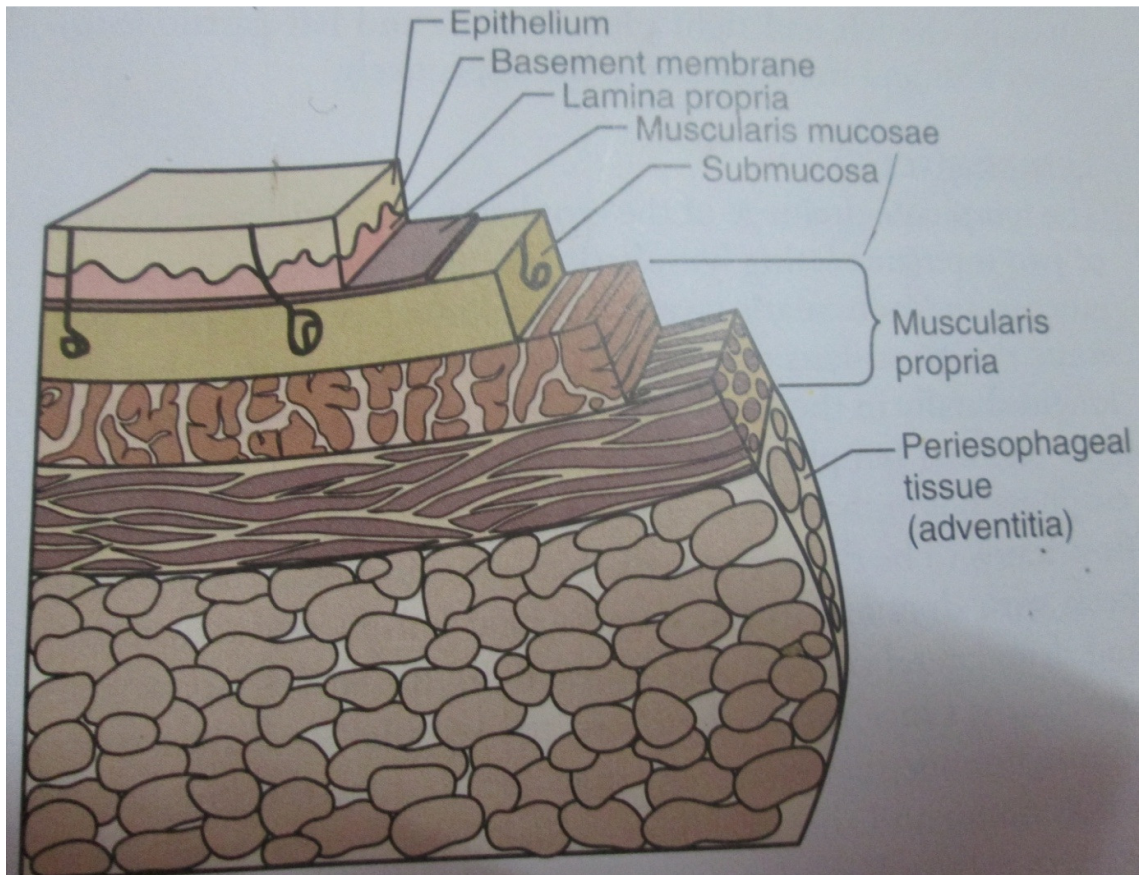
Transition of circular muscle of esophagus to oblique muscle of stomach is at the incisura is called as 'coller of Helvetius'

Between these muscle layers, there are connective tissue, blood vessels and auerbach's plexus.

Esophagus is devoid of serosal layer.

It is wrapped by a layer of fibroalveolar adventitia.

LAYERS OF THE ESOPHAGUS



Physiology of esophagus

Main function of esophagus is to transport materials from pharynx to stomach.

It also constrains amount of air the swallowed and amount of material that refluxed backward from stomach.

In normal physiological condition, configuration of esophagus allows effortless unidirectional flow of food material towards stomach.

Upper esophageal sphincter—4 to 5 cm length and having average resting one of 60mm Hg, which prevents excess swallowing of air.

Lower esophageal sphincter—2 to 3 cm in length and having average resting tone of 6 to 26 mm Hg, which prevents excess regurgitation from stomach. Function of the lower esophageal sphincter is influenced by various factors like gastric distension, smoking, alcoholism, and hormonal variations.

Physiological events of swallowing in esophageal phase

Relaxation of upper esophageal sphincter and

Constriction of posterior constrictor propel the food further

UES closes with pressure of 90 mm Hg, which prevents reflux of bolus to the pharynx.

Post relaxation contraction of UES, initiates peristalsis

Primary peristalsis moves 2 to 4 cm/sec. within 9 sec, bolus reaches the LES

Secondary peristalsis — progressive one and initiated by distension and irritation of esophagus, to clear up material that left behind after primary peristalsis.

Tertiary peristalsis—non progressive, occurs following voluntary swallowing or between swallows, uncoordinated and causes spasm.

LES relaxes by vagal stimulation and lasts for 4 to 6 seconds which allows efficient transport of bolus from esophagus to stomach.

LES returns to its resting tone which prevents regurgitation.

Normal manometric values	
Upper esophageal sphincter	
Total length	4.0 – 5.0 cm
Resting pressure	60 mmHg
Relaxation time	0.58 sec
Residual pressure	0.7 – 3.7 mmHg
Lower esophageal sphincter	
Total length	3.0 – 5.0 cm
Resting pressure	6 – 26 mg
Relaxation time	8.4 sec
Residual pressure	3 mmHg
Esophageal body contraction	
Amplitude	40 – 80 mmHg
Duration	2.3 – 3.6 sec

Etiology of carcinoma esophagus

Smoking and alcohol plays major role in etiological aspect of carcinoma of esophagus .These two factors increases risk of a esophagus by 5 fold individually and combined, the risk increases by 25 to 100 fold. Squamous cell carcinoma is the common type resulted by tobacco and alcohol.

Dietary deficiency of vitamins (vitamin A,C,E.), minerals (zinc, molybdenum, selenium) .

Consumption of pickled and smoked foods,(increased content of nitrosamine), Long term ingestion of hot beverages, are playing role in causation of esophagus.

Injury to the oesophageal mucosa occurs in caustic ingestion, bulimia, ahalasia, oesophageal diverticula, external beam irradiation.

Plummer -vinson syndrome, tylosis (autosomal dominant trait) are considered premalignant conditions for carcinoma esophagus.

Plummer Vinson syndrome is otherwise known as Peterson-kelly syndrome which is characterized by presence of esophageal webs, iron deficiency anemia and cheilitis and koilonychia. May be associated with splenomegaly. Common in female and presented with complaints of dysphagia.

Tylosis – familial syndrome characterized by increased thickening of palms and soles associated with increased risk of carcinoma of esophagus.

Increased incidence of adenocarcinoma in developed countries might be due to increased incidence of GERD, western diet.

Intake of caffeine, fats, acidic and spicy foods cause reduction in tone of LES, which in turn increases reflux and chronic mucosal damage lead to metaplasia, dysplasia(Barrett's esophagus) and finally to malignancy.

Barretts esophagus- esophagus is lined by squamous epithelium except in lower 2 to 3 cm which is lined by columnar. This squamo columnar junction migrates upward because of chornic irritation secondary to reflux. Squamous cells are replaced by columnar cells by metaplasia. These columnar cells are liable to get dysplasia and malignant changes.

Comparing to the normal esophagus, presence of anatomical abnormalities like stricture, diverticula and motility disorders like achalasia cardia are increases the risk of malignancy.

Presense of other malignancy in aerodigestive tract also increases the risk of esophageal malignancy.

Helicobacter pylori infection may increase the risk of carcinoma of esophagus, but many studies are going on for its confirmation.

Last but not the least Genetic alterations are associated with increased risk of carcinoma of esophagus.

Clinical features of carcinoma of esophagus

- Dysphagia is the cardinal symptom of carcinoma of esophagus, but its presence indicates that the disease is in advanced stage. At least 50% of the lumen to be occluded before the symptom of dysphagia to manifest. Weight loss may be the consequence of poor intake due to long term dysphagia as well as cancer cachexia.
- In early stage symptoms are just mimic GERD. Burning in epigastrium, reflux, feeling of indigestion. Lumen of the oesophagus to be reduced 50% to develop dysphagia. Normal average lumen diameter is 24cm, it would have been reduced to 12 cm in patient complaining of dysphagia.
- Signs and symptoms of aspiration are frequent in fistula.
- Hoarseness of voice – in case of recurrent laryngeal nerve involvement. Horner's syndrome due to involvement of sympathetic trunk.
- Bone pain and paralysis of diaphragm are signs of advanced disease. Involvement of supra clavicular nodes indicate disseminated malignancy.

Diagnosis

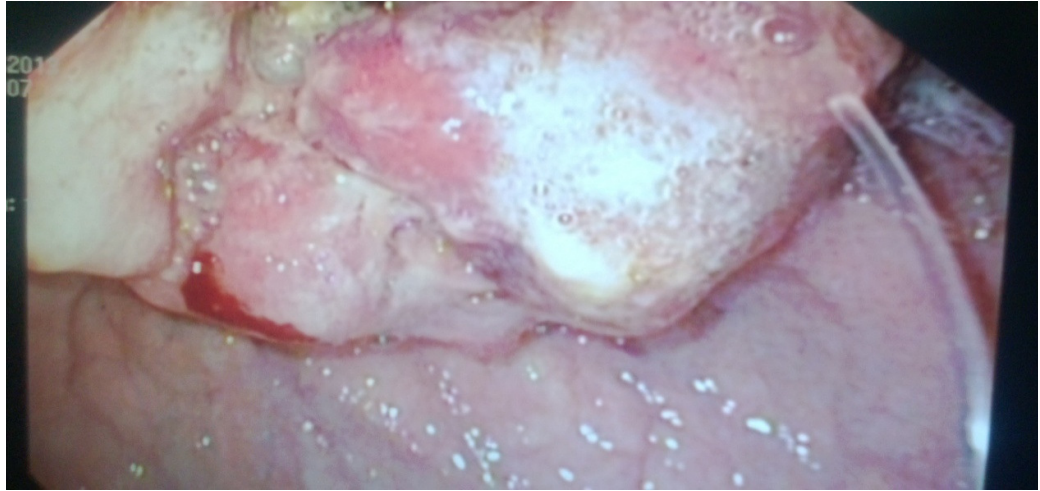
Endoscopy

Diagnosis of carcinoma of esophagus is done best by using upper GI endoscopy.

By upper GI endoscopy, the following information of malignancy is obtained which are useful in deciding the treatment plan.

- Site of the lesion (distance from the incisor tooth).
- Physical appearance of the lesion (polypoidal, ulcerative, cauliflower like).
- Extend of the lesion.
- Relationship with cricopharygeal muscle, Gastro Esophageal Junction and gastric cardia
- Status of the stomach.

Endoscopic picture showing growth in the lower third of esophagus.



Endoscopic Punch biopsy by biopsy forceps



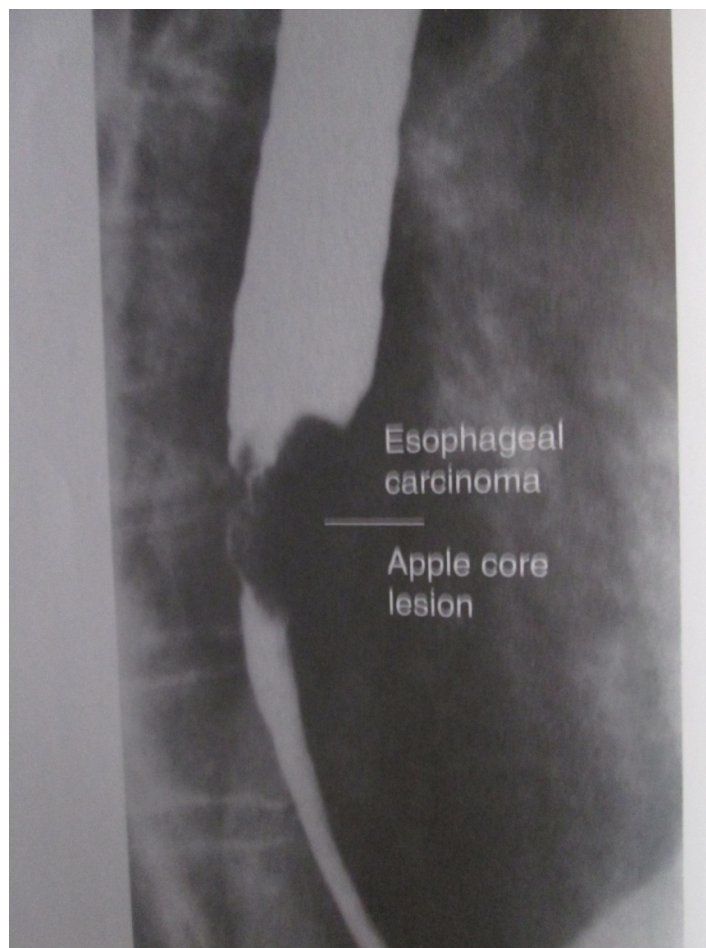
Esophagraphy

Esophagraphy is ideal first investigation for dysphagia patients .

Anatomy and function of esophagus can be assessed.

Intra luminal and intra mural lesions can be differentiated. Luminal compression whether it is internal or external can be assessed.

Apple core appearance of esophagus can be recognized easily in case of ca esophagus.



Computerised tomography

It is an additional diagnostic tool for accurate staging of carcinoma esophagus.

CT chest provides information about size and extend of lesion, thickness of esophagus and stomach. It also gives information about regional lymph node status and distant metastases to the organs. Especially in T4 stage it is useful in assessing local invasion. Fistula and other anatomical variations also can be assessed. CT abdomen gives informations about distant metastasis to liver and other structures.

Positron Emission tomography

Fluorodeoxyglucose (FDG)—positron emission tomography is useful for staging workup from information of local lesion regional nodes and distant metastases.

Sensitivity and specificity are bit higher than CT. Though it is an evolving modality, it is also only a part of diagnostic workup.

MRI

Not routinely done for esophageal malignancy. This modality is helpful in identifying vascular and neural involvement.

Endoscopic ultrasound

Endoscopic ultrasound is useful diagnostic tool in staging of esophageal cancer.

Length and depth of the tumor, involvement of adjacent structures, lymph node status can be assessed.

Biopsy from paratracheal, subcranial, paraesophageal, celiac, lesser curvature and gastrohepatic regions.

Endoscopic mucosal resection

Endoscopic mucosal resection is useful in premalignant and early lesions. This technique is used as both diagnostic and therapeutic tool. Through double lumen endoscopy negative pressure sucks bit of mucosa and resection done by using a snare.

Minimally invasive surgical modalities

Minimal invasive techniques are used as diagnostic tool for staging of disease. Bronchoscopy, mediastinoscopy, thoroscopy and laparoscopy are the procedures used as per the need. By these procedures lymph node biopsy can be taken up from concern regions for staging work up.

TNM Classification of carcinoma esophagus

The TNM classification for the staging of carcinoma of esophagus is provided below

A) Squamous Cell Carcinoma of esophagus

Primary tumor (T)

Tx Primary tumor cannot be assessed

T0 No evidence of primary tumor

Tis High-grade dysplasia(in situ)

T1 Tumor invades lamina propria, muscularis mucosae, or sub mucosa

T1a Tumor invades lamina propria or muscularis mucosae

T1b Tumor invades submucosa

T2 Tumor invades muscularis propria

T3 Tumor invades adventitia

T4 Tumor invades adjacent structures

T4a Resectable tumor invading pleura, pericardium, or diaphragm

T4b Unresectable tumor invading other adjacent structures, such as aorta, vertebral body, and trachea, etc.

Regional lymph nodes (N)

Nx Regional lymph node(s) cannot be assessed.

N0 No regional lymph node metastasis.

N1 Metastasis to 1-2 regional lymph nodes.

N2 Metastasis to 3-6 regional lymph nodes.

N3 Metastasis to seven or more regional lymph nodes.

Distant metastases (M)

M0 No distant metastases.

M1 Distant metastases.

Histological grade (G)

Gx Grade cannot be assessed—stage grouping as G1

G1 Well differentiated squamous cell carcinoma

G2 Moderately differentiated squamous cell carcinoma

G3 Poorly differentiated squamous cell carcinoma

G4 Undifferentiated .

Stage	T	N	M	Grade	Tumor location
0	Tis (HGD)	N0	M0	1, X	Any
IA	T1	N0	M0	1, X	Any
IB	T1	N0	M0	2-3	Any
	T2-3	N0	M0	1, X	Lower, X
IIA	T2-3	N0	M0	1, X	Upper, middle
	T2-3	N0	M0	2-3	Lower, X
IIB	T2-3	N0	M0	2-3	Upper, middle
	T1-2	N1	M0	Any	Any
IIIA	T1-2	N2	M0	Any	Any
	T3	N1	M0	Any	Any
	T4a	N0	M0	Any	Any
IIIB	T3	N2	M0	Any	Any
IIIC	T4a	N1-2	M0	Any	Any
	T4b	Any	M0	Any	Any
	Any	N3	M0	Any	Any
IV	Any	Any	M1	Any	Any

B) Staging of Adenocarcinoma

Primary tumor (T)

TX Primary tumor cannot be assessed

T0 No evidence of primary tumor

Tis High-grade dysplasia

T1 Tumor invades lamina propria, muscularis mucosae, or submucosa

T1a Tumor invades lamina propria or muscularis mucosae

T1b Tumor invades submucosa

T2 Tumor invades muscularis propria

T3 Tumor invades adventitia

T4 Tumor invades adjacent structures

T4a Resectable tumor invading pleura, pericardium, or diaphragm

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aorta, vertebral body, and trachea

Regional lymph nodes (N)

NX Regional lymph node(s) cannot be assessed

N0 No regional lymph node metastasis

N1 Metastasis in 1-2 regional lymph nodes

N2 Metastasis in 3-6 regional lymph nodes

N3 Metastasis in 7 or more regional lymph nodes

Distant metastases (M)

M0 No distant metastases

M1 Distant metastases

Histological grading**Histological grade (G)**

GX Grade cannot be assessed—stage grouping as G1

G1 Well differentiated

G2 Moderately differentiated

G3 Poorly differentiated

G4 Undifferentiated—stage grouping as G3 squamous

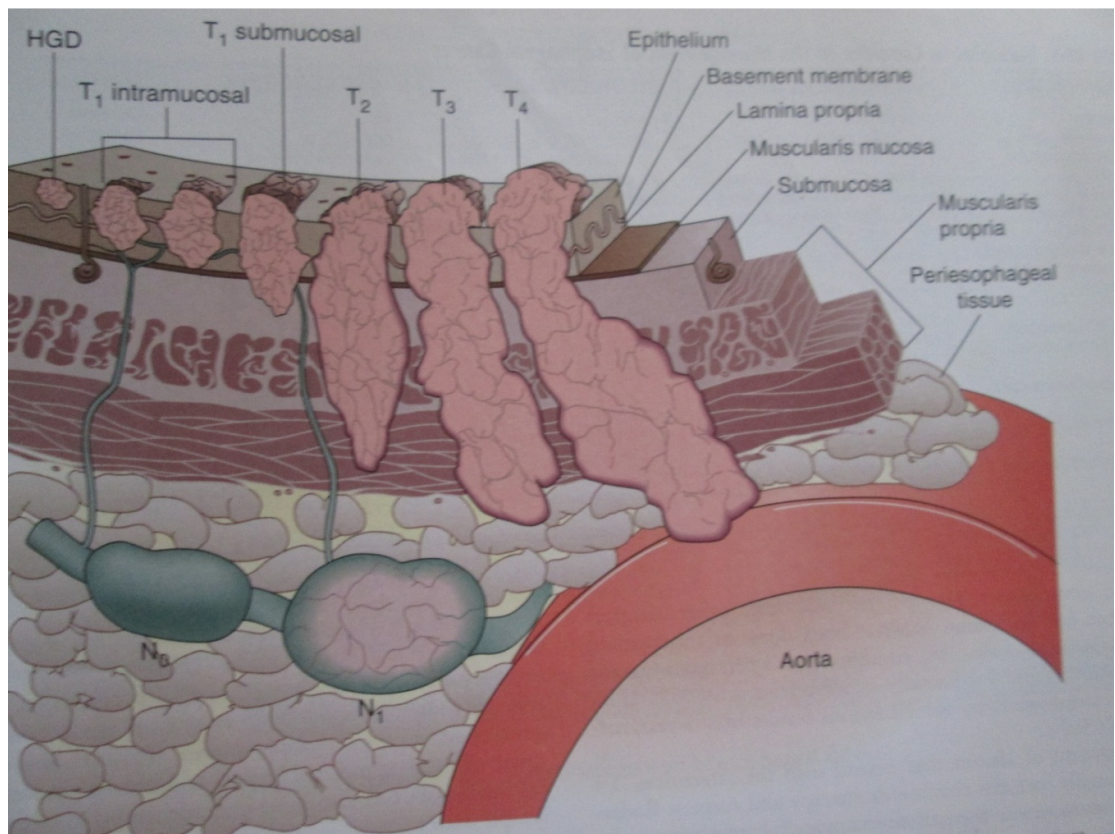
Anatomic stage/prognostic groups

Stage	T	N	M	Grade
0	Tis (HGD)	N0	M0	1, X
IA	T1	N0	M0	1-2, X
IB	T1	N0	M0	3
	T2	N0	M0	1-2, X
IIA	T2	N0	M0	3
IIB	T3	N0	M0	Any
	T1-2	N1	M0	Any
IIIA	T1-2	N2	M0	Any
	T3	N1	M0	Any
	T4a	N0	M0	Any
IIIB	T3	N2	M0	Any
IIIC	T4a	N1-2	M0	Any
	T4b	Any	M0	Any
	Any	N3	M0	Any
IV	Any	Any	M1	Any

Apart from TNM staging recognized by American Joint Committee on Cancer, Ellis classification which uses WNM (wall penetration, lymph node, metastasis) is widely accepted and followed.

TNM staging of carcinoma of esophagus

T-primary tumor stage; N0-absence of regional lymph nodes; N1- presence of regional lymph nodes; HDG- High Grade Dysplasia.



**Wall penetration-node-metastasis(WNM) staging of carcinoma of
esophagus**

STAGE	FEATURES
W : Wall penetration	
W0:	Intramucosal mucosa penetration
W1:	Intramural mucosal penetration
W2:	Transmural mucosa penetration
N: Regional lymph nodes	
Nx	Regional lymph nodes cannot be assessed
N0	No regional lymph node metastasis
N1	Four lymph node metastases or fewer
N2	More than four lymph node metastases
M: Distant metastasis	
Mx	Distant metastases cannot be assessed
M0	No distant metastases
M1	Distant metastases present

Treatment

Goal of treatment of ca esophagus is better patient outcome in all aspects. This can be achieved by proper staging and decision of treatment plan that may be surgical, chemotherapy, radiotherapy or endoscopic procedures. Most of the patients at the time of diagnosis in stage of incurable disease and palliative measures to reduce the debilitating symptoms are followed. Hence treatment plan is constructed to each individual according to the various factors.

Treatment plan and prognosis varies according to

Histology

Location

Local extend

Regional lymph node status

Distant lymph nodes

Systemic metastasis.

Squamous cell carcinoma is showing better response to chemo radiotherapy. So surgical resection is limited in many of the cases.

Adeno carcinoma has got poor sensitivity to chemo radiation, hence need aggressive surgical approach.

Location

Lesions in cervical part of esophagus are mostly squamous cell carcinomas. These are more aggressive and locally invasive. Palliative chemo radiation and segmental resection can be planned in advanced cases.

In case of thoracic part lesions may be of either squamous cell type or adeno carcinoma . Near total esophagectomy by using transthoracic or transabdominal approach.

In case of lower 3rd of esophagus invariably adenocarcinoma is the histological type. Distal esophagectomy through transabdominal or transthoracic is the treatment of choice.

Total gastrectomy should be combined, if the Barrett's esophagus exists. Near total esophagectomy to be done if lesion is in segment of the Barrett's esophagus or long segment is involved by the lesion.

Lymph node status

According to the nodal involvement ca esophagus patients can be divided into low risk and high risk

LN1 <50% considered as low risk and LN1>50% considered as high risk.

In low risk patients –conservative surgical resection like transhiatal or vagal sparing esophagectomy and limited lymphadenectomy and followed by adjuvant chemotherapy node sampling is positive.

In high risk patients – neoadjuvant chemotherapy, surgical resection with radical lymphadenectomy is beneficial.

Distant node and systemic metastasis compels palliative chemoradiotherapy. Surgery is of no use in these patients. Palliative jejunostomy is beneficial in feeding aspects.

NON SURGICAL TRATMENTS

Up to 1970, radiotherapy is the only modality used in non operable squamous cell carcinoma patients, gave 5 year survival rate of 6%. After 1980 Chemoradiotherapy and multimodal treatment showed increased survival rate than radiotherapy alone.

Chemotherapy

Combination therapy is beneficial in loco regional diseases.

Cisplatin with 5 fluorouracil is preferred weekly for 2 to 10 weeks, upto 8 cycles. Addition of mitomycin or etoposide or paclitaxel are found to increase the response in loco regional control.

Neoadjuvant therapy limited with 4cycles whereas definitive therapy may continued upto 3 months.

Radiotherapy

Loco regional control acquired with combination of chemotherapy.

For definitive treatment totally 6000cGy to 6400cGy in fractions of 180-200cGy for 5days in a week for 6 to 7 weeks.

Palliative treatment

Palliation in case of esophageal malignancy is only to reduce the tumor burden and to overcome the major disability that is dysphagia and poor nutritional status.

Surgical resection with external beam irradiation and surgical bypass like major procedures which practiced were changed by various simple and nonsurgical procedures that achieve similar result.

- Endoscopic stent placement.
- Endoscopic laser therapy.
- Brachytherapy
- Photo dynamic therapy (PDT)
- Feeding gastrostomy or jejunostomy

Endoscopic sent placement

To overcome swallowing difficulty in inoperable and advanced cases, intubation of either rigid plastic or rubber tubes were used but nowadays self expanding metal stents are commonly used, which are deployed in correct position by using endoscope to bypass the obstruction caused by the tumor.

Endoscopic laser therapy

Laser beam used to create channel in growth that obstructing the lumen of the esophagus and gives passage to the food material. Also helpful in growths those invaded through gaps of network in the expansible metallic stent. As it is temporary one needs repeat attempts in weekly interval.

Brachytherapy

Intra luminal radiation by a device placed through endoscope. It has short penetrating distance to a tumor.

Photo Dynamic Therapy (PDT)

Used in inoperable and in patients not willing for surgery in case of mucosal dysplasia and early intra mucosal tumors. Photosensitisers are administered through endoscope and they are taken up by the dysplastic cells and early neoplastic cells.

Photosensitivity of the skin, stricture formation are the most common risks in using this modality.

Surgical resections

Surgery is not the definitive cure in most of the cases of carcinoma esophagus. It is one of the part of the multimodality treatment.

Enblock esophgectomy

It is an extensive resection that includes Wide local excision with radical thoracic and abdominal lymphadenectomy. Comparing to all esophageal resections, enblock esophagectomy is more extensive and aggressive that clears involved tissue and regional lymph nodes. Incisions-- left cervical, right chest, abdominal.

As an initial step thoracotomy done and all important veins and lymphatics including azygos vein, hemi azygos vein, intercostals veins are ligated and divided and removed along with tumor en bloc. Through

thoracotomy incision mediastinal, diaphragmatic and lymphatic associated with thoracic duct are removed.

Through upper midline abdominal incision stomach mobilized and radical abdominal lymphadenectomy done. Stomach pulled through posterior mediastinal space in which cervical esophagogastric anastomosis done. It has been proved that 5 year survival rate in early stages are better in case of enblock esophagectomy than transhiatal esophagectomy. If the lymph node involvement is more than nine in number, there is no additional benefit with enblock esophagectomy.

Transthoracic esophagectomy

It is done by Ivor Lewis two phase procedure in which laparotomy is done first then thoracotomy is done for anastomosis. After mobilizing stomach and lower esophagus, feeding jejunostomy performed and patient is turned to left. Thoracotomy incision is made and esophagus transected at the level of azygos vein and esophago gastric anastomosis done. Radical lymphadenectomy is not performed here. Surgical resection of affected segment and available thoracic and abdominal lymphadenectomy done. Morbidity and mortality are higher than transthoracic esophagectomy. Pneumonia, effusion like respiratory problems and atrial fibrillation, myocardial infarction like cardiac morbidities are common.

For more proximal lesion another cervical incision needed for better clearance.(McKeown three phase procedure)

Incisions –right chest,abdominal and left neck

Transhiatal esophagectomy

In this procedure stomach and esophagus mobilized through midline abdominal incision, this mobilization is done by blind manual manipulation through widened hiatus. Stomach tubulised and pushed into posterior mediastinum and esophago gastric anastamosis done. Lymph nodes which are accessible in neck, thoracic region and in abdomen are removed but no attempts are made for radical dissection.

Mortality rate reported is only 4% which is much less comparing to other esophagectomy procedures, and also reported less respiratory and cardiac morbidities. These advantages made this procedure to be considered as safest resection of esophagus. Injury to the greatvessels, airway structures and incomplete lymph node dissection are considered as disadvantage of this procedure.

Incisions—left neck and abdomen.

Vagal sparing esophagectomy

It is Similar to transhiatal esophagectomy except that the esophagectomy done without shearing the vagus. High selective vagotomy is done to preserve motility of the pylorus.

Minimally invasive esophagectomy

Thoracoscopy or Transcervical mediastinoscopy and laparoscopy are done instead of thoracotomy and laparotomy. This procedure gives result that comparable with transhiatal esophagectomy with less pain and minimal hospital stay. Safe and effectiveness of this procedure proved only in short term practice.

Endoscopy

History of endoscopy

1911---Hoffman introduced an instrument with articulated lenses and prism to visualize gastrointestinal tract.

1931—Worf (a fabricator of medical instruments) and Schindler (a physician) introduced semiflexible gastroscope.

1954—Hopkins revealed a model of flexible fiber imaging device.

1958—Larry Curtis (a student of physics) and Basil Hirschowitz (trainee in gastroenterology) introduced first flexible fibro-optic gastroscope.

1960—There was invention of charge coupled device (CCD) by which endoscopic images are processed by computer and transmitted to TV screen.

Upper GI endoscope



Parts of endoscope

Commonly used upper GI endoscope are 120 cm by length.

Basically it has got endoscope, processor and accessories.

Eye piece—this is the part which is handled by Endoscopist. It is connected to processor via tube system called umbilical cord. It has got

It has got three ports – one for air/water, one for suction and another one for light source.

There are two wheels – to change the direction of tip of introducing tube. Large one is for up and down movement, smaller one for right and left movement.

There is a Insertion tube -- to introduce into alimentary tract. It has got separate sideway channel for introduction of biopsy forceps.

Eye piece of endoscope



Holding of Eye piece of the endoscope



Preparation of the patient

- Check for loose tooth, dentures—Which may cause danger of aspiration.
- Enquire for previous cardiac illness—As the procedure may cause vagal stimulation, it may endanger the life of patient.
- Overnight fasting of the patient is needed. In emergency situations , scopy can be done after washing the stomach by nasogastric tube.
- Written consent to be obtained in patient's mother tongue. Nature, risk, and necessity of the procedure to be well explained.
- Pharyngeal anaesthesia by 4% lignocain spray is sufficient for diagnostic procedure. Pethidin 50 mg or diazepam 10 to 40 mg may be needed for therapeutic procedures.
- Nasogastric tube aspiration for 24 hrs in cases of gastric obstruction, where stagnation of food and fluid will be present in spite of starvation.
- Instrument should be sterilised by both physical methods (removing debris in inner and outer surface) and chemical methods. (disinfection by Glutraldehyde)

Procedure

Patient position

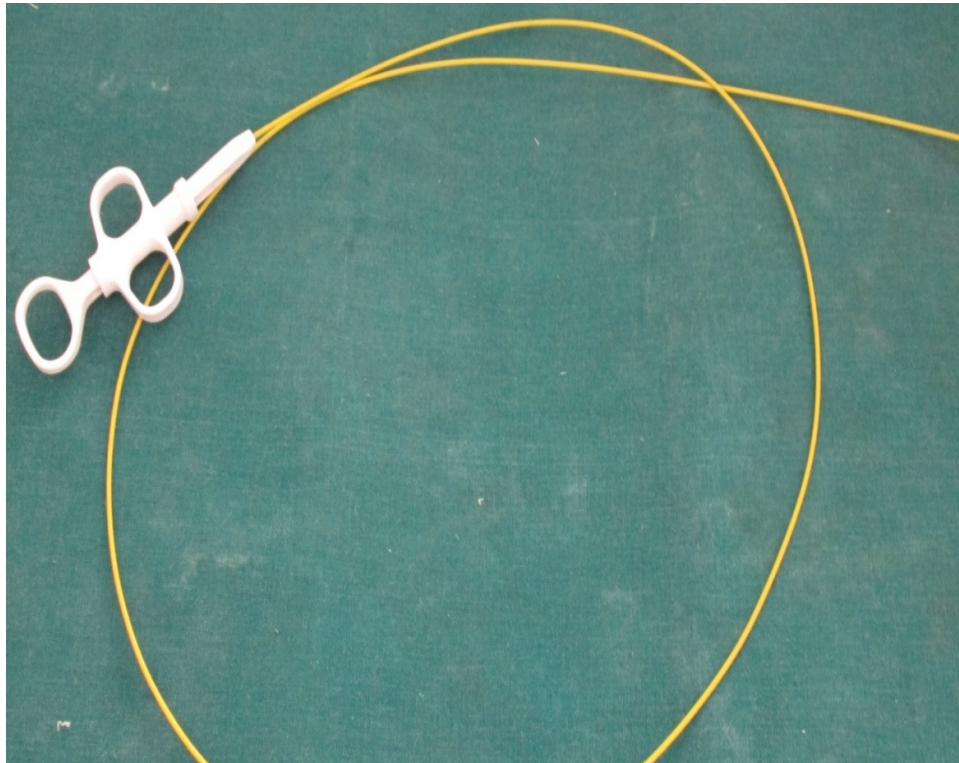
- Patient to be placed on his left lateral position without pillow.
- Position of the neck is held in flexion by assistant, while introducing the instrument. Because if neck is extended, tube will pass into larynx.
- Patients pronated, left hand to be kept over his chest and by his right hand he is allowed to grasp the edge of the table.
- Hips and knees of the patient to be in flexion.

Insertion

- Mouth guard inserted between teeth
- Instrument's tip flexed slightly and passed through mouthpiece along the dorsum of tongue.
- Keeping the tip in flexion advanced to crico pharyngeal sphincter and patient is asked to swallow.
- As cricopharyngeal sphincter relaxes, the instrument pass smoothly into esophagus. If there is difficulty, a push can be given by index and middle finger of the left hand.
- Further advancement of tube done under vision.
- Air can be used for insufflations of the lumen.

- Inserting tube handled in right hand and eye piece by left hand of the endoscopist, direction wheels can be operated by left thumb.
- Pinchcock action due to inspiratory action of diaphragmatic crura.
- After entering the gastric angulus tip is flexed to identify pylorus.
- Rotation of the tip to be done to view lesser curvature and angulus.
- keeping the pyloric orifice in the centre of field, tip of the instrument is advanced to slip into the pylorus and to view upto second part of duodenum.

Biopsy forceps



Causes of dysphagia

Difficulty in swallowing may occur in many conditions which prevent propulsion of bolus from esophagus to stomach. It may be due to extraluminal, intraluminal or esophageal wall pathology.

Common causes are wall pathology carcinoma esophagus, congenital or acquired strictures, GERD, candidial infection, achalasia cardia, diffuse esophageal spasm, congenital anomalies, esophageal diverticulum, plummer vilson syndrome .

Other neurological causes are like bulbar palsy, vertebralbasilar insufficiency also can cause dysphagia.

Foreign body is the commonest intraluminal cause of dysphagia. Foreign bodies may be coin/denture/fish or meat bone.

Mediastinal node compression is the main extraluminal cause for dysphagia. Aortic compression, thyroid enlargement, rolling hiatus hernia, dysphagia lusoria are the other extraluminal causes.

GERD

Gastro Esophageal Reflux disease is the reflux of the contents from the stomach to the esophagus. It is the most common esophageal pathology which accounts 3/4th of the esophageal diseases.

It is commonly due to dysfunction of lower esophageal sphincter. Because of this dysfunction pressure of the sphincter is not maintained to prevent the contents reflux back from the stomach. Normal pressure of 12 to 25 mmHg reduces to 1 to 3 mm Hg for few seconds normally, but when this normal relaxation time prolongs, it reflux results. This resting pressure may decreased by secretin, coffee and fatty meal.

Other causes are, reduced esophageal clearance mechanism, gastric distension and delayed gastric emptying. Alcohol consumption, smoking, taking fatty and spicy foods, lifestyle are plays vital role in its cause.

It can be classified into primary and secondary GERD. In primary GERD incompetent lower esophageal sphincter is the reason and in case of secondary it is due to surgery or other diseases which causes reduced pressure in LES.

Commonly manifests as heart burn due to acidity which reflux back from the stomach. Pain will be more on lying down position and in night times. Odynophagia is common and dysphagia occurs once complication sets.

Triad of GERD.

- Heart burn
- Epigastric pain with dysphagia
- Regurgitation

Complications are

- Reflux esophagitis
- Hiatal hernia
- Strictures
- Barrett's esophagus
- Esophageal malignancy (commonly adenocarcinoma).

Investigations

Upper GI endoscopy can visualize the inflamed mucosa of the esophagus, oesophago gastric junction which enters into the esophagus when patient retches. I also useful in diagnosing Barrett's esophagus by assessing Z line.

- Barium study
- Monometry—to assess the function of lower esophageal sphincter.
- 24 hours esophageal pH monitoring
- ⁹⁹Tc scan

Treatment

Life style modification

Abstinence of alcohol and cessation of smoking gives major results in treating the patients with GERD. Avoiding coffee,tea, chocolate also beneficial for the patient. Weight reduction to be advised as obesity is one of the common cause for this disease. Propped up position and small frequent diet are advisable.

Drugs

Medical line of management is effective in case of uncomplicated GERD which neutralizes the acidity and prevents further damage of mucosa. Drugs commonly used are

- H2 antagonists; antacids
- Proton pump inhibitors – omeprazole 20 mg bd for 3 to 6 months
- Prokinetic drugs- metaclopramide, domperidone,
- Cisapride, mosapride.
- Defoaming—semithicone
- Mucosal protector drugs—sucralfate, colloid bismuth.

Endoscopic therapy

Various endoscopic procedures useful in treatment of GERD which include

- Endoluminal suturing
- Gelatin mixed with microspheres injected through endoscopy, spheres makes tissue bulky and gelatin gets absorbed.
- Delivery of radioopaque hydrogen into submucosa under endoscopic guidance.
- Estrinyl vinyl alcohol injection through endoscope.
- Endocinch technique
- Full thickness plication through endoscope.

Surgery

Surgical intervention is indicated in case of complications and failure of drug treatment.

Principle of antireflux surgery is to restore the pressure of lower esophageal sphincter, maintaining the length of intra abdominal esophagus, approximation of diaphragmatic crura to prevent hiatus hernia and repaired junction to be tension free.

Surgery is the choice for long term advantages. It is also the effective treatment in comparing with other modalities.

Laparoscopic fundoplication, collis-nissen vertical gastroplasty and fundoplication, resection of oesophago gastric junction in case of Barrett's esophagus, Besley mark 4 operation are the standard procedures carried out.

Hiatus hernia

In diaphragmatic hernia, hiatus hernia is the commonest one.

Types

Type1 – Upward displacement of gastroesophageal junction through diaphragmatic hiatus into mediastinum. It is the commonest one and usually asymptomatic.

Type2—Along with gastroesophageal junction, fundus of the stomach also passes through the hiatus. So it is called as rolling hernia.

Type3-- Combination of type1 and type2.

Type 4—Other abdominal viscera like transverse colon and omentum will be the content of the hernia.

Sliding hernia is commonly associated with GERD. In this type of hernia, cardia of the stomach moves back and forth between mediastinum and peritoneal cavity.

Saint's triad is

- Hiatus hernia
- Diverticulosis
- Gallstones

Achalsia cardia

Achalasia- the greek word means failure to relax; cardia is gastro esophageal junction. So failure of relaxation of cardia and functional obstruction caused by disorganized esophageal peristalsis is known as achalasia cardia. It occurs as a result of faulty integration of parasympathetic impulses. Thomas willis in 1672 identified the disease.

It is commonly idiopathic condition where degeneration of Auerbach's plexus more in gastro esophageal junction. Stress, vitamin deficiency, chaga's disease are may be the other etiological factors.

Circular muscle fibers in distal part get thickened. Increased presence in peristalsis, absence of peristalsis causes functional obstruction. There will be dilatation and atony of proximal esophagus.

Females are commonly affected. When it is associated with diffuse esophageal spasm it is called as "vigorous achalasia" .

Common clinical manifestations are

- Progressive dysphagia—more for liquid food than solid food.

- Heart burn—common symptom.
- Odynophagia and weight loss.
- Recurrent pneumonia and lung abscess

Staging

Staging of the achalasia cardia has been done according to the degree of proximal dilatation of esophagus.

Stage	Dilatation
1	<4cm
2	4-6cm
3	>6cm
4	Sigmoid dilatation.

Investigations

Barium swallow – pencil like narrowing of the lower end of esophagus which is known as “Bird beak apperence”. Dilatation of proximal esophagus will be seen.

Esophageal monometry to asses the pressure of lower esophageal sphincter and peristalsis of esophageal tube.

Endoscopy – completely closed loweresophageal sphincter and dilated proximal esophagus can be visualized. Biopsy of distal end mucosa can be taken.

Barium swallow picture of achalsia cardia



Treatment of achalasia cardia

Drugs—calcium channel blockers , vasodilators and botulinum toxin A are the drugs which can be tried. But drug therapy is not effective for long term benefits.

Forcible dilatation -- this procedure is done to overcome the functional obstruction. It can be done by

Plummer's pneumatic dilatation

Negus pneumatic dilatation

Surgery-- modified heller's myotomy is the procedure followed in the cases of achalasia cardia.

Barrett's esophagus

It is a condition of the esophagus where the mucosa of its lower end undergo metaplastic changes due to chronic exposure of acidic environment as a result of reflux. Squamous cell lining of the esophagus replaced by columnar epithelium. These columnar cells are prone for dysplasia.

Types of barrett's esophagus.

According to the length of involvement of mucoas it can be typed into two. If length of metaplastic involvement of mucosa is more than 3

cm, it is called as “long segment Barrett’s esophagus. It is the classical Barrett type. If the involved segment is less than 3cm, It is known as short segment Barrett’s esophagus.

Histologically it can be divided into

- Gastric type -- chief and parietal cells are present
- Intestinal type-- goblet cells are present
- Junctional type-- mucous gland alike in cardia.

Clinical features

Commonly occurs in males. Whites are commonly affected. Heart burn and other features of GERD will be present in barrett’s esophagus. Haematemesis can occur in long standing cases due to ulceration and bleeding.

Complications

- Dysphagia
- Ulceration and bleeding
- Stricture formation
- Perforation
- Adenocarcinoma of lower esophagus.

Diagnosis can be done by esophagoscopy and biopsy of the mucosa from lower end of esophagus.

Treatment: management of the barrett's is mandatory as longstanding of this condition may lead to adenocarcinoma of lower esophagus. Treatment modalities are include

- Laser ablation
- Endoscopic photodynamic therapy
- Coagulation by argon beam
- Endoscopic mucosal resection

Surgery—in case of high grade dysplasia surgical resection is the choice. Transhiatal esophagectomy is preferred in these patients.

Barrett's esophagus



Dysphagia lusoria

“sport of nature” is the meaning for this latin word. Vascular congenital anomaly which causes compression on esophagus and there by difficulty in swallowing.

These patients have got an aberrant subclavian artery from descending aorta. It courses posterior to the esophagus. Often It may form a vascular ring around both esophagus and trachea.

Most of the patients are asymptomatic, it usually manifests beyond 40 years of age. Apart from dysphagia patient may complaint chest pain, wheeze and recurrent infection of respiratory tract.

Diffuse esophageal spasm

It is one of the rare cause for dysphagia. Usually present in lower 2/3rd of esophagus. There will be hypertrophy of circular muscle fibres and persistence of high pressure results in difficulty of swallowing. pressure may as high as 400 to 500 mm Hg. Can be treated with calcium channel blockers, vasodilators. Endoscopic dilatation may helpful in refractory cases. Surgical intervention is myotomy upto the aortic arch.

MATERIALS AND METHODS

Materials and methods

This study was conducted for a period of one year from november 2012 to october 2013. About 50 patients from various units who underwent procedure of upper GI endoscopy for complaints of dysphagia in surgery department of Coimbatore medical college were analyzed.

Patients with dysphagia over the age of 12 irrespective of the sex, are subjected to OGD scopy and followed through. The technique and importance of procedure are clearly explained to the patients and informed consent is obtained .Under all aseptic and safety measures endoscope introduced, and visualized esophagus, stomach, duodenum up to the 2nd part of duodenum. Any growth or lesions suspicious of Carcinoma , will be located and its anatomical situation assessed by calculating length of scope introduced. By using biopsy forceps, tissue samples will be collected and sent for HPE.

Brush cytology will be collected for cases where tissue biopsy is not possible. Reports will be collected and maintained as a data.

Patients with negative findings but with symptoms will be subjected for follow up scopy after 3months.

Exclusion criteria

- Children under the age of 12
- Pregnant women
- Patients with epilepsy who are in irregular treatment.

Inclusion criteria

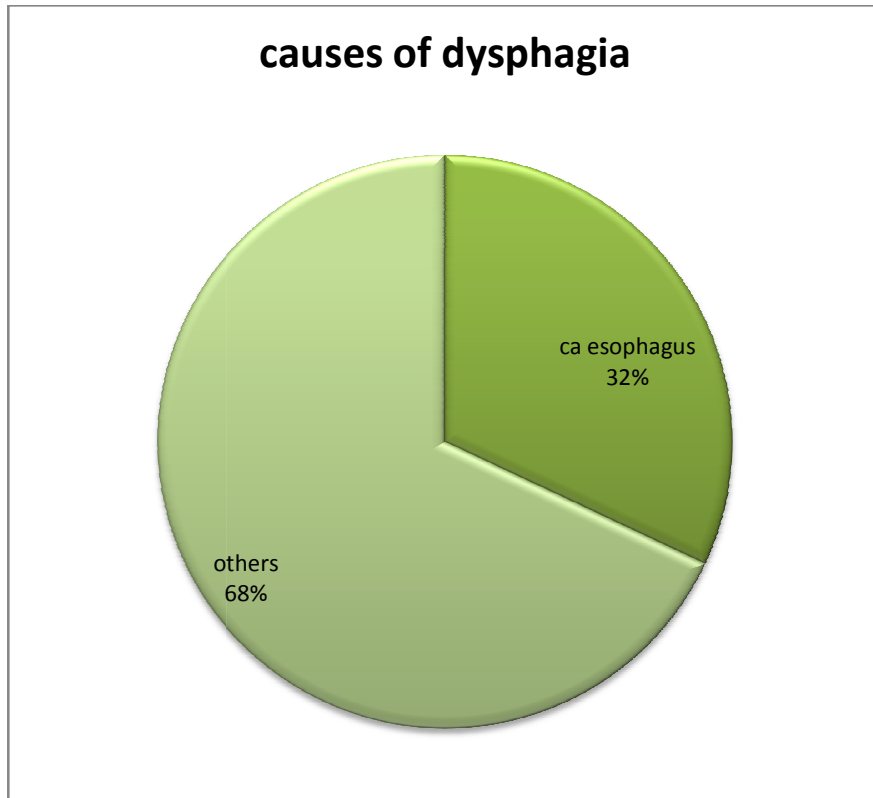
- Patients of both sex over the age of 12 with the complaints of dysphagia.
- Chronic GERD patients.

RESULTS

Observation:

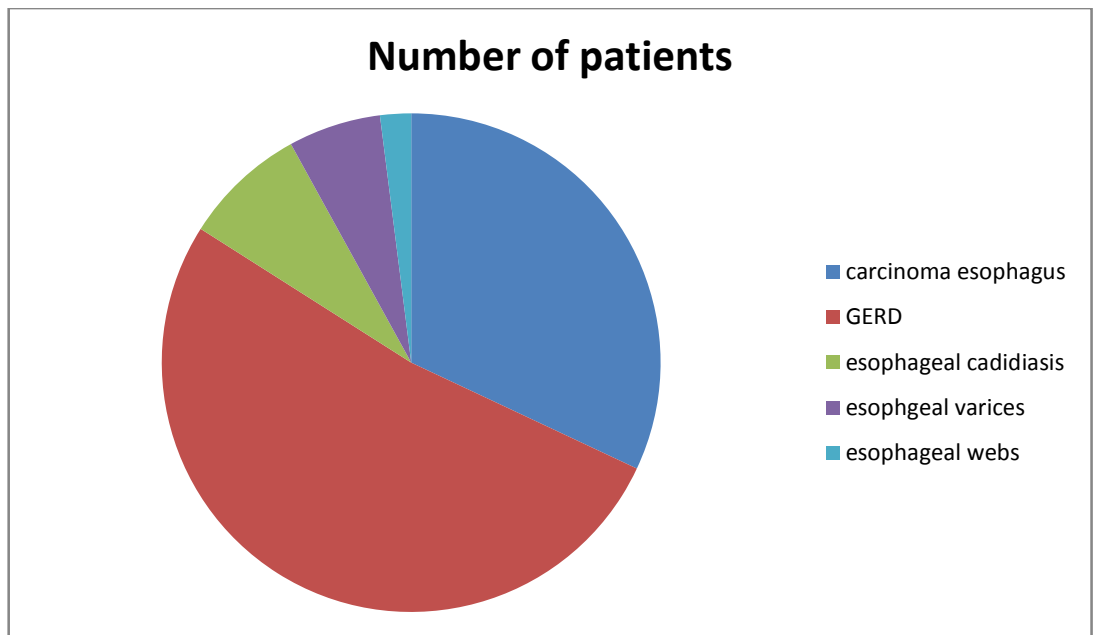
Incidence of carcinoma of esophagus in patients with complaints of dysphagia in our study as follows

No of patients with complaints of dysphagia	Carcinoma esophagus	percentage
50	16	32%



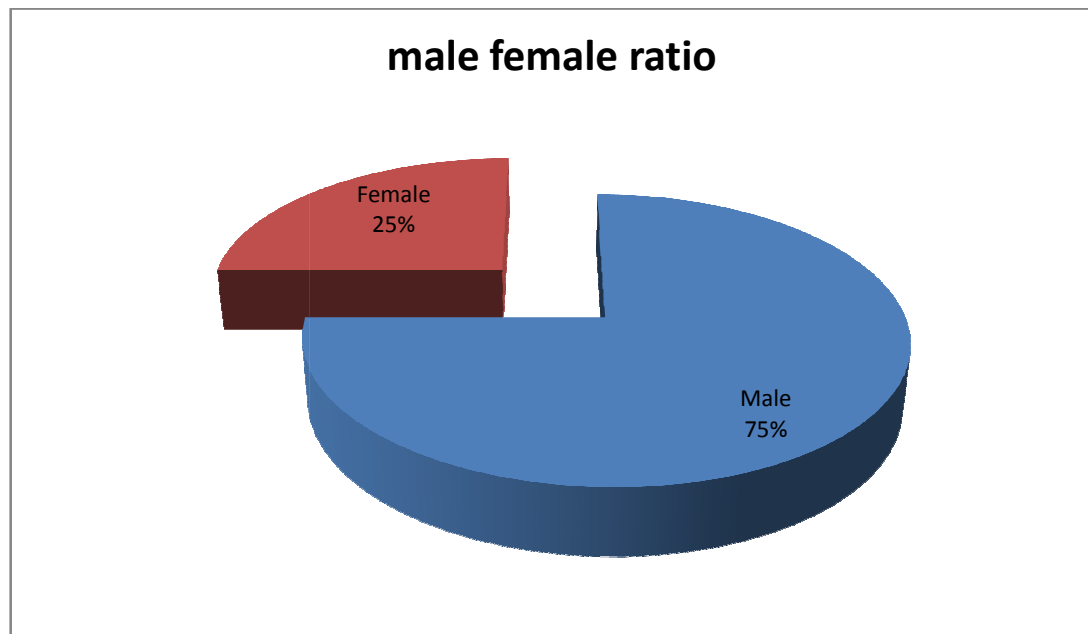
Endoscopic Findings observed in our study

Findings	No of patients
Carcinoma esophagus	16
GERD	26
Esophageal candidiasis	4
Esophageal webs	1
Esophageal varices	3



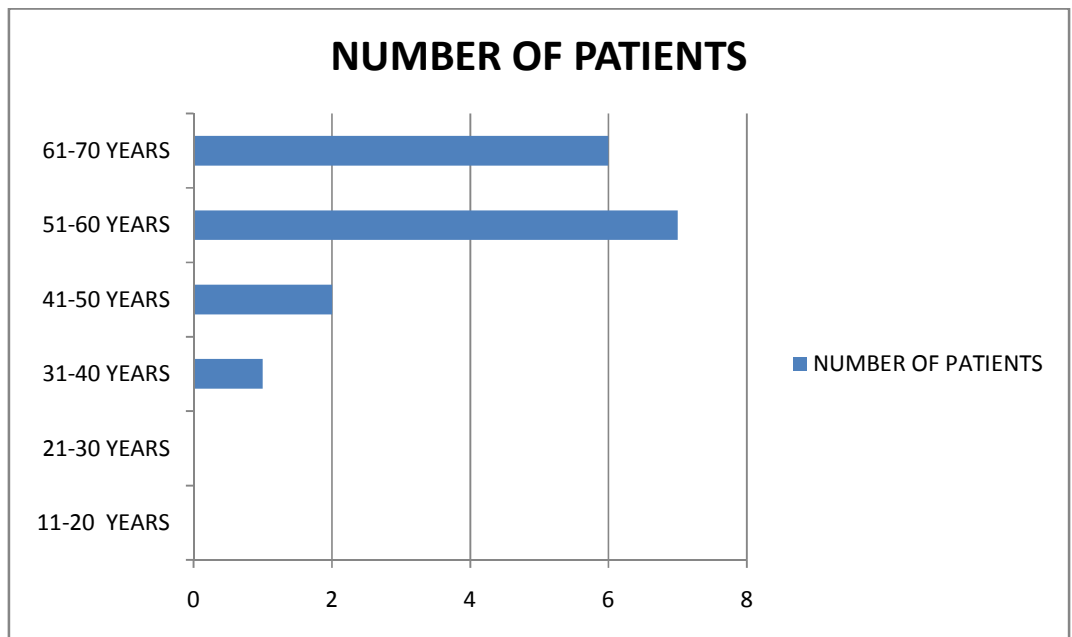
Sex distribution of carcinoma of esophagus

Number of carcinoma of esophagus causes	Male	Female	M:F
16	12 (75%)	4 (25%)	3:1



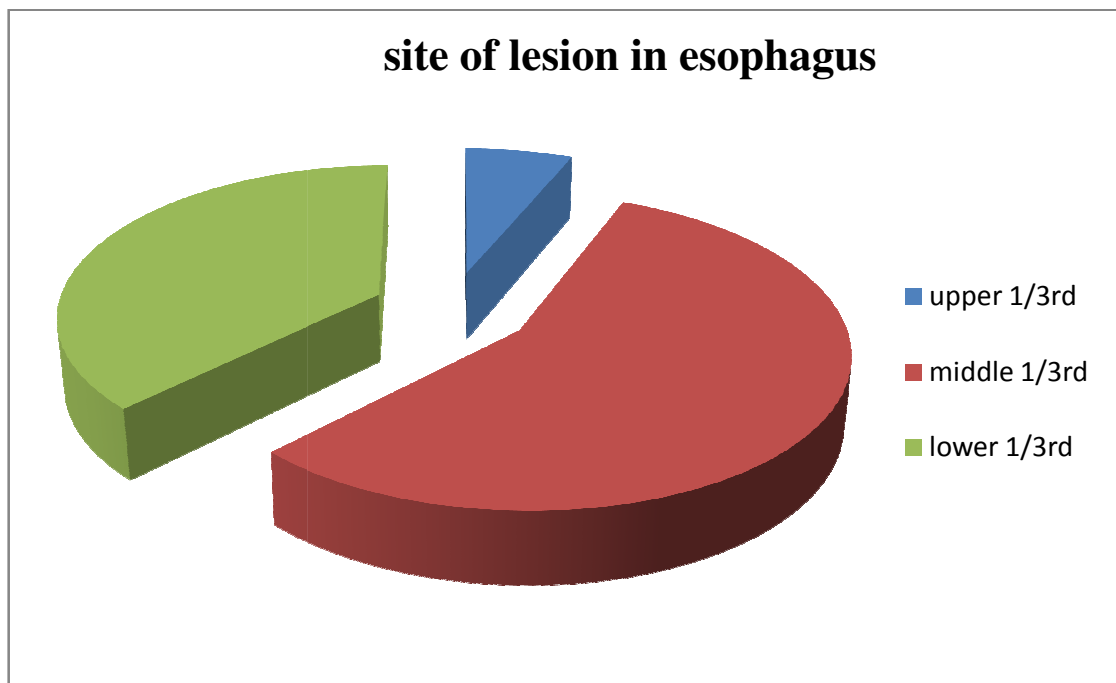
Age specific distribution of carcinoma of esophagus

s. no	No. of patients
11-20 years	nil
21-30 years	nil
31-40 years	1
41=50 years	2
51=60 years	7
61 and above	6



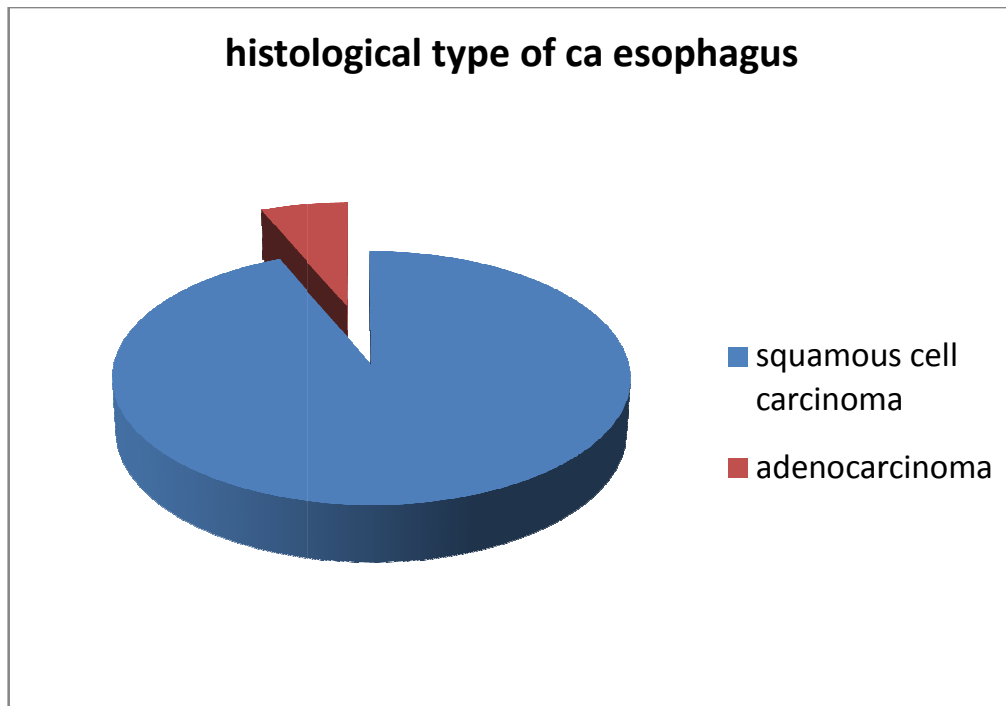
Anatomical Site distribution of carcinoma esophagus in our study

Site	
Upper 1/3 rd	1 (6.25%)
Middle 1/3 rd	9 (56.25%)
Lower 1/3 rd	6 (37.5%)



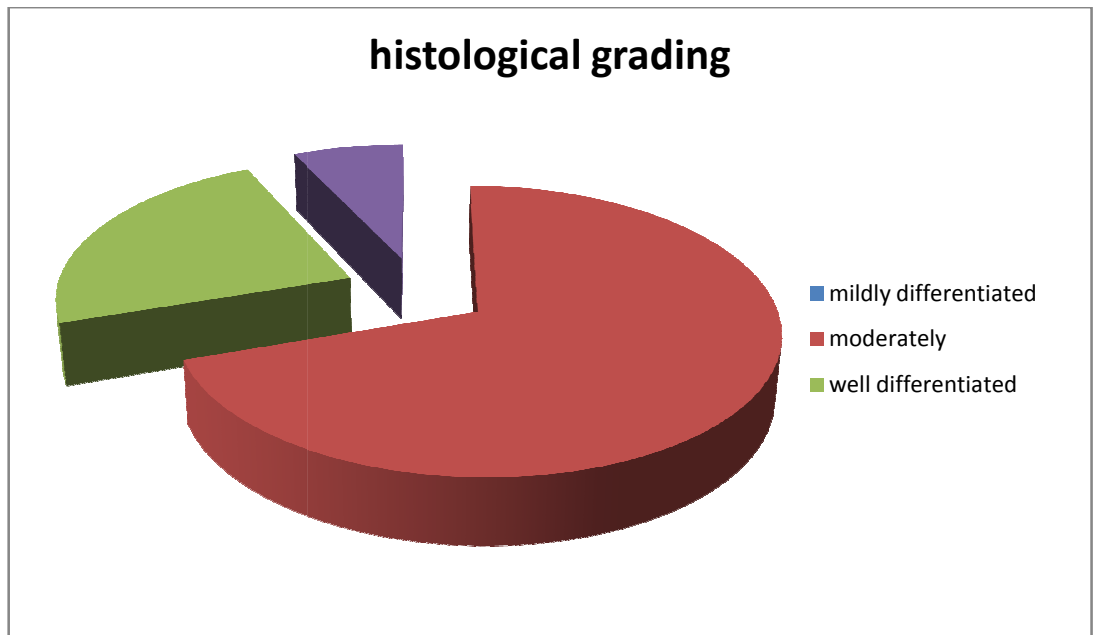
Histological types in our study

s.no	Histological type	No.of cases	Percentage
1.	Squamous cell carcinoma	15	93.75%
2.	Adenocarcinoma	1	6.25%
3.	Others	nil	0%



Histological Grading of carcinoma of esophagus

grading	No of patients
Poorly differentiated	0 (0%)
Moderately differentiated	12 (75%)
Well differentiated	4 (25%)



DISCUSSION

In our study there are 16 out of 50 cases of dysphagia are diagnosed as carcinoma of esophagus.

Male female ratio is 12:4 i.,e 3:1

Global male female ratio is 3:1 for the cases of squamous cell carcinoma.

Age distribution of carcinoma of esophagus in our study is as following

31 to 40years	1
41 to 50years	2
51 to 60years	7
>60 years	6

No cases were diagnosed as carcinoma of esophagus before the age of 40years in our setup.

It is more common after 5th decade of life.

All the cases of squamous cell carcinoma are from low socioeconomic status.

Invariably all male cases are smokers and alcoholics. They are users of either or any one of them on regular basis. In case of etiology of

squamous cell carcinoma smoking and alcohol consumption alone plays a major role.

Vitamin and mineral deficiency are much prevalent in people of low socio economic status and are prone to develop carcinoma of esophagus.

One case of plummer- vinson syndrom was present with anemia and ca esophagus (squamous cell carcinoma) . Dilatation had been done for esophageal webs.

No other cases with hereditary factors like Tylosis seen in our study.

Site of lesion

Most of the cases were in the middle third of esophagus

Cases with involvement of

Upper 1/3rd ----- 1

Middle 1/3rd ----- 9

Lower 1/3rd ----- 6

Histological grading

Most of the cases in our study are belonging to histological grade of moderately differentiated squamous cell carcinoma.

One case of moderately differentiated carcinoma identified.

Squamous cell carcinoma

Poorly differentiated	nil
-----------------------	-----

Moderately differentiated	11
---------------------------	----

Well differentiated	4
---------------------	---

Adeno carcinoma	1
-----------------	---

Poorly differentiated	nil
-----------------------	-----

Moderately differentiated	1
---------------------------	---

Well differentiated	nil
---------------------	-----

Exact staging of the malignancy is not possible just only by endoscopic analysis, as all the staging systems are mainly on the basis of involvement of depth into the wall of esophagus and nodal involvement.

Ct chest and abdomen, PET-FDG (Fluro Deoxy Glucose) scan, endoscopic ultrasound are gives more accurate and additional information for staging of the disease.

Therapeutic activities

All patients were treated by chemotherapy .

Transesophageal esophagectomy done for one case. Palliative stenting had been done for 5 patients in our set up.

Esophageal stenting is the procedure in which self retaining expansible metallic or non expansible stents are introduced to esophagus through endoscope to fix in the position so that it can bypass the obstructed lumen of esophagus.

In case of advanced malignancy of esophagus in patients whome operability is not possible, stenting is the procedure which improves nutritional status of the patient by improving the food intake.

Assessing the exact location and length wise extension of the lesion are important for stenting and it had been done by endoscopy before stenting in our patients.

CONCLUSION

Conclusion

In our series of 50 patients with dysphagia referred to our tertiary care hospital for endoscopic investigation, 16 cases were found to have Carcinoma of Esophagus. Out of the 16 cases of carcinoma of esophagus, 15 were squamous cell carcinoma and one was adenocarcinoma . When these patients with dysphagia came to our hospital, it is found that already 50% of the lumen had got obstructed by growth in case of carcinoma of esophagus.

Regarding the sex distribution, it is found that 12 out of 16 patients are male and 4 out of 16 cases were females. The high incidence in male was due to their smoking and drinking habits causing high incidence of GERD in them. Regarding the age distribution, the patients above 50 years were commonly affected.

Among the anatomical sites of carcinoma of esophagus the middle third of esophagus was commonly involved followed by lower third of esophagus. Squamous cell carcinoma was the commonest histological type of carcinoma of esophagus seen in our series. From our study we conclude that Carcinoma of the esophagus should be ruled out in all cases of dysphagia.

APPENDIX 1

PROFORMA

Name of the patient

date of procedure:

Age/sex

Ip/op number

Presenting complaints :

Provisional diagnosis :

Upper GI endoscopic findings:

Esophagus

Lower esophageal sphincter

Stomach

Duodenum

impression

signature of the endoscopist

HPE report

APPENDIX 2

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LEGENDS

GI	--	Gastro Intestinal
GERD	--	Gastro Esophageal Reflux Disorder
TNM	–	Tumor- Node-Metastasis
HGD	–	High Grade Dysplasia
UES	–	Upper Esophageal Sphincter
LES	–	Lower Esophageal Sphincter
HPE	–	Histo Pathological Examination
CT	--	Computerized Tomography
MRI	--	Magnetic Resonance Imaging
HPE	--	Histo Pathological Examination

APPENDIX – 3

MASTER CHART

SL NO.	NAME	AGE/SEX	I.P.NO.	DYSPHAGIA	DATE OF PROCEDURE	PRESENCE OF LESION IN OESOPHAGUS	SITE OF LESION	EXTENT OF LESION	SQUAMOUS CELL CARCINOMA	HISTOLOGICAL GRADING	ADENOCARCINOMA	H/O SMOKING	H/O ALCOHOLISM	BOTH	H/O GERD
1	Mary	55/F	59773	yes	6/10/2012	no	n.a	n.a.	no		no				
2	Vishnu	65/M	57593	yes	6/10/2012	yes	16-20 Cm	n.a.	no		no				
3	Kuttiappan	52/M	62034	yes	13/10/2012	yes	27 cm	n.a.	yes	moderately differentiated	no	yes	yes	yes	Yes
4	Thulasiammal	58/F	53400	yes	13/10/1012	yes	25 cm	n.a.	yes	moderately differentiated	no	no	no	no	yes
5	Mariyammal	67/F	68919	yes	24/11/2012	no			no		no				
6	Shanmugham	62/M	245912	yes	24/11/2012	yes	38 cm	n.a.	yes	moderately differentiated	no	yes	yes	yes	yes
7	Mani	40/M	51402	yes	24/11/2012	no			no		no				
8	Ramaraj	45/M	565720	yes	1/12/2012	no			no		no				
9	Karuppaiyyan	45/M	73841	yes	8/12/2012	yes			no		no				
10	Thangavelu	50/M	597667	yes	15/12/2012	yes			no		no				
11	Syed mohammed	57/M	597664	yes	15/12/2012	no			no		no				
12	Palanisamy	41/M	22425	yes	12/012013	yes	27 cm	n.a.	yes	moderately differentiated	no	yes	no	no	yes
13	Joseph	53/M	2722	yes	19/01/2013	yes	37 cm	n.a.	yes	well differentiated	no	yes	yes	yes	no
14	Gopal	60/M	621279	yes	5/1/2013	no			no		no				

15	Bethan	55/M	5566	yes	2/2/2013	yes	28 cm	n.a.	yes	modderately diffrentiated	no	yes	no	no	yes
16	Selvaraj	63/M	8559	yes	23/02/2013	yes			no		no				
17	Nagarajan	55/M	8678	yes	9/3/2013	no			no		no				
18	Sundar	29/M	14000	yes	9/3/2013	no			no		no				
19	Jabamalai Raj	63/M	13126	yes	15/03/2013	no			no		no				
20	shanmugham	66/M	13067	yes	15/03/2013	yes	38 cm	38-43 cm	yes	moderatyly diffretiated	no	yes	yes	yes	no
21	Karuppasamy	80/M	12892	yes	23/03/2013	no			no		no				
22	Selvaraj	56/F	13069	yes	23/03/2013	yes	38 cm	n.a.	yes	moderatyly diffretiated	no	yes	y es	yes	yes
23	Sundaram	65/M	189877	yes	23/03/2013	yes			no		no				
24	Amirthavasagam	45/F	18044	yes	2/4/2013	no			no		no				
25	Thilagavathy	60/M	17809	yes	2/4/2013	no			no		no				
26	Surendranathan	55/M	19353	yes	9/4/2013	yes	28 cm	28 to 32 cm	yes	well dffretiated	no	yes	yes	yes	yes
27	Palaniyammal	60/F	23741	yes	11/5/2013	yes	22 cm	n.a.	yes	moderatyly diffretiated	no	no	no	no	no
28	Rajendran	45/F	22406	yes	15/04/2013	no			no		no				
29	Sundarasamy	46/M	231409	yes	15/04/2013	yes			no		no				
30	Murugesan	66/M	24034	yes	14/05/2013	yes			no		no				
31	Pandiyar	50/M	30098	yes	14/05/2013	yes			no		no				
32	neela veni	45/F	31712	yes	14/05/2013	yes	30 cm	32-35 cm	yes	moderatyly diffretiated	no	no	no	no	yes
33	Nagoor meeran	25/M	36612	yes	15/06/2013	no			no		no				
34	Shanmugham	65/M	3996	yes	6/7/2013	yes			no		no				
35	Dhanraj	62/F	41084	yes	11/7/2013	yes			no		no				
36	Nagarajan	40/F	778671	yes	15/07/2013	no			no		no				
37	kamaraj	40/F	495577	yes	15/08/2013	no			no		no				
38	Rajagopal	65/M	45184	yes	1/8/2013	yes	25 cm	n.a.	yes	well dffretiated	no	yes	yes	yes	yes

39	kalamam	65/F	47406	yes	8/8/2013	yes			no		no				
40	kalavathy	59/M	46813	yes	8/8/2013	yes	29 cm	29-30 cm	yes	moderately differentiated	no	no	no	no	no
41	ganesan	40/M	50397	yes	24/08/2013	yes	30 cm	30-40 cm	no	moderately differentiated	yes	yes	yes	yes	yes
42	ramasamy	60/M	596801	yes	29/08/2013	yes	25 cm	n.a.	yes	moderately differentiated	no	yes	yes	yes	yes
43	panchalingam	62/M	52066	yes	29/08/2013	yes	28 cm	28-33 cm	yes	moderately differentiated	no	yes	no	yes	yes
44	raju singh	45/M	608128	yes	29/08/2013	no			no		no				
45	arukkathal	44/M	265380	yes	14/09/2013	no			no		no				
46	rangan	78/M	52104	yes	24/09/2013	no			no		no				
47	mohan das	33/M	56996	yes	24/05/2013	no			no		no				
48	mariappan	51/M	30724	yes	3/6//2013	no			no		no				
49	kaliveeran	47/M	1285/13	yes	21/06/2013	no			no		no				
50	kuppusamy	48/F	2017/13	yes	20/07/2013	no			no		no				