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CLINICO-PATHOLOGICAL STUDY OF UPPER GASTROINTESTINAL TRACT ENDOSCOPIC BIOPSIES

Pathology

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ABSTRACT

In the present era, gastrointestinal pathology is one of the most important and expanding branches of medicine. The diseases of upper gastrointestinal tract are responsible for a wide range of morbidity and mortality1. Histopathology plays an important role in diagnosis of various lesions in gastrointestinal tract. In the present era, gastrointestinal pathology is one of the most important and expanding branches of medicine. Upper gastrointestinal tract endoscopy is regarded as the investigation of choice in patients with upper GIT disorders which often present with dyspepsia. This procedure is quick and has no serious complications. The diagnosis of helicobacter pylori in the gastric biopsy is very critical as it known to cause inflammatory as well as neoplastic lesions like Adenocarcinomas. Endoscopic visualization helps in clinical diagnosis and on histopathological correlation of biopsy specimen helps in accurate final diagnosis2. This aids in diagnosing the suspected malignancies as well as for monitoring the course of disease, response to therapy and to prevent complication. **Summary:** Endoscopic biopsies are an effective tool in the proper diagnosis and management of various upper gastrointestinal tract lesions.

KEYWORDS

Upper gastrointestinal tract endoscopy, Adenocarcinomas, Helicobacter pylori.

INTRODUCTION:

In the present era, gastrointestinal pathology is one of the most important and expanding branches of medicine.

The diseases of upper gastrointestinal tract are responsible for a wide range of morbidity and mortality[1]. Histopathology plays an important role in diagnosis of various lesions in gastrointestinal tract.

In 1968 the successful adventure of flexible fibre optic endoscope had a revolutionary impact on the diagnosis of upper gastrointestinal tract lesions.[2] Among various disorders acid peptic disease is the most common condition worldwide.

Upper gastrointestinal tract endoscopy is regarded as the investigation of choice in patients with upper GIT disorders which often present with dyspepsia. This procedure is quick and has no serious complications.

The diagnosis of helicobacter pylori in the gastric biopsy is very critical as it known to cause inflammatory as well as neoplastic lesions like adenocarcinomas. Endoscopic visualization helps in clinical diagnosis and on histopathological correlation of biopsy specimen helps in accurate final diagnosis[2].

This aids in diagnosing the suspected malignancies as well as for monitoring the course of disease, response to therapy and to prevent complication.

MATERIAL AND METHODS:

- The present study included endoscopic biopsies of upper gastrointestinal tract received in the Department of Pathology Chalmeda Anand Rao Institute of Medical Sciences over a period of 18months.
- Relevant clinical data of each patient which include age, sex, clinical symptoms and endoscopic findings are noted from the case records.
- Endoscopic biopsy specimens fixed in 10% neutral formalin are processed in automatic tissue processor and embedded in paraffin wax.
- Before processing, the samples were stained with eosin for better and complete visualization and wrapped in a tissue paper to prevent dispersion and loss of tissue.
- Paraffin tissue blocks are cut in to 3-5 microns thickness, sections are prepared and stained with routine Haematoxylin and Eosin (H&E) stain and studied.
- Giemsa stain and Periodic Acid Schiff stain are used where ever necessary.

Inclusion Criteria

- All upper gastrointestinal tract biopsies received in department of pathology for histopathological examinations.

Exclusion Criteria

- Patients presenting with lesions in the oral cavity, pharynx and lesions beyond the 2nd part of duodenum.
- Inadequate biopsies, post therapy biopsies.

Procedure for Giemsa Staining[3]

- Bring sections to water.
- Stain with Giemsa solution (1 part Giemsa stain with 4 parts Distilled water) for 30-45 minutes.
- Wash in running tap water.
- Dehydrate with absolute alcohol 2-3 changes
- Clear with 2-3 changes of xylene.
- Mount with Dibutyl Phthalate Polystyrene Xylene (DPX)

The neoplastic lesions were diagnosed as per WHO Classification of tumors. The presence of any associated/predisposing lesions such as ulcers, Barrett's Esophagus, fungal infections, Helicobacter pylori, etc were noted.

OBSERVATIONS AND RESULTS

Out of 100 endoscopic biopsies received for histopathological examination, 35 cases were esophageal, 46 cases were from stomach, 10 cases were from Gastro-esophageal junction, 9 cases from duodenum.

The endoscopic biopsies were divided as non-neoplastic which included 30 cases (30%) & neoplastic which included 70 cases (70%). The age & sex incidence, correlation with presenting complaints & endoscopic findings was calculated separately for both non-neoplastic and neoplastic categories.

Among the non-neoplastic lesions, 12 cases (40%) were reported as Chronic gastritis which included a peak age group of 51-60 years. Chronic non specific Duodenitis constituted 9 cases (30%) which peaked in 61-70 year age group. The peak age group of gastric ulcer was found to be 51-60 years. Polyps were common in 31-40 and 61-70 age groups.

Among the neoplastic lesions, (including precursor lesions) the most common was adeno carcinoma constituting 35 cases (50%) followed by 26 cases of squamous cell carcinoma (37.2%). The most common age group was 51-60 years .The lowest age being 34 years & highest 82

years. The non-neoplastic lesions including gastritis, Duodenitis, ulcers and polyps were more common in males accounting for 20 cases (66.7%) than females 10 cases (33.3%).

Overall, the incidence of neoplastic lesions was more in males with 48 cases (68.5%). Squamous cell carcinomas showed a slight male preponderance of (61.5%) while adenocarcinomas showed 71.4% predilection for males. Adenosquamous, dysplasia and BE showed increased incidence in males.

Table - 1 Presenting Complaints In Upper Git Lesions

PRESENTING COMPLAINT	LESION		TOTAL
	NON-NEOPLASTIC	NEOPLASTIC	
Vomitings	5(16.7%)	20(28.6%)	25
Pain	18(60%)	20(28.6%)	38
Dysphagia	0	27(38.5%)	27
Dyspepsia	6(20%)	2(2.8%)	8
Belchings	1(3.3%)	0	1
Weight loss	0	1(1.5%)	1
TOTAL	30	70	100

The most common presenting complaint in the non-neoplastic category was pain (60%) followed by dyspepsia (20%).

The most common presenting complaint of neoplastic lesions was Dysphagia (38.5%) followed by vomiting (28.6%) & pain (28.6%).

Among the non neoplastic lesions most common presenting complaint is pain followed by dyspepsia, vomiting(16.7%) and belching (20%).

Chronic gastritis is associated with pain (66.6%) followed by vomiting (25%). Chronic nonspecific duodenitis is associated with pain and dyspepsia (44.4%). Polyps and gastric ulcers are associated with pain mostly.Among the neoplastic lesions dysphagia (38.5%) is common presenting complaint followed by pain and vomitings (28.6%%).

In squamous cell carcinoma most common presenting complaint is dysphagia (80.8%) followed by vomitings (49.2%) In adenocarcinoma most common presenting complaint is pain (54.3%) followed by vomiting (34.4%).

Table – 2 Endoscopic Findings Of Non-neoplastic Upper Git Lesions

ENDOSCOPIC FINDING	LESION				TOTAL
	GASTRITIS	DUODENITIS	POLYP	ULCER	
Ulcerative	5(41.6%)	2(2.2%)	0	4(100%)	11(36.7%)
Mucosal thickness	7(58.3%)	7(77.8%)	0	0	14(46.7%)
Ulceroproliferative	0	0	0	0	00
Polypoidal	0	0	5(100%)	0	05(16.6%)
Total	12	9	5	4	30(100%)

The most common endoscopic finding of non-neoplastic lesion was mucosal thickness (46.7%) followed by ulcerative lesion (36.7%)

Table - 3 Endoscopic Findings Of Neoplastic Upper Git Lesions

Endoscopic Findings	LESIONS					Total
	SCC	Adeno carcinoma	Adeno squamous	Dysplasia	Barrett esophagus	
Ulcerative	10(38.5%)	12(34.2%)	0	4(80%)	3(100%)	29(41.5%)
Mucosal thickness	0	0	0	1(20%)	0	1(1.4%)
Ulcero proliferative	16(61.5%)	23(65.7%)	1(100%)	0	0	40(57.1%)
Polypoidal	0	0	0	0	0	0
Total	26	35	1	5	3	70

The neoplastic lesions most commonly presented as ulcero proliferative lesions on endoscopy (57.1%) followed by ulcerative lesion(41.5%).

Table – 4 Site Wise Distribution Of Non-neoplastic Lesions Of Upper Git

SITE	LESION				TOTAL
	GASTRITIS	DUODENITIS	POLYP	ULCER	
ESOPHAGUS	0	0	0	0	0
GEJ	2	0	1	0	3
STOMACH	10	0	4	4	18
DUODENUM	0	9	0	0	9
TOTAL	12(40%)	9(30%)	5(16.6%)	4(13.4%)	30

Among the non-neoplastic lesions chronic gastritis .was more common (40%) followed by chronic non specific duodenitis (30%), polyps (16.6%) and gastric ulcers (13.4%).

Table-5 Site Wise Distribution Of Neoplastic Lesions Of Upper Git

SITE	LESION					TOTAL
	SCC	Adeno carcinoma	Adeno squamous	Dysplasia	BE	
ESOPHAGUS	26(100%)	1(2.6%)	1(100%)	4(80%)	3(100%)	35
GEJ	0	7(20%)	0	0	0	7
STOMACH	0	27(77.2%)	0	1(20%)	0	28
DUODENUM	0	0	0	0	0	0
TOTAL	26(37.1%)	35(50%)	1(1.4%)	5(7.1%)	3(4.2%)	70

Among neoplastic lesions adenocarcinoma (50%) was more common followed by squamous cell carcinoma (37.1%). Adenocarcinoma was seen commonly in stomach (77.2%) followed by gastro-oesophageal junction (20%). Squamous cell carcinoma was seen solely in oesophagus. In oesophagus all (35) lesions were neoplastic. The most common is squamous cell carcinoma (74.4%) followed by dysplasia (11.5%), Barrett oesophagus (8.5%) ,adenocarcinoma (2.8%) & Adenosquamous carcinoma (2.8%). Squamous cell carcinoma most commonly occurs at middle one third of oesophagus (57.6%) followed by lower third (27.1%) and upper third (15.3%). The most common SCC was moderately differentiated squamous cell carcinoma (88.4%) followed by poorly differentiated (11.6%). In gastro-esophageal junction, 70% are neoplastic lesions and 30% are non-neoplastic lesions.

All the neoplastic lesions were adenocarcinoma and most of them are moderately differentiated adenocarcinoma (85.3%) followed by poorly differentiated adenocarcinoma (14.7%).Among non neoplastic lesions most of them are chronic gastritis followed by polyp. In stomach neoplastic lesions (60.8%) are common than non-neoplastic lesions (39.2%). In neoplastic lesions adenocarcinoma (58.7%) was more common followed by dysplasia. Gastric adenocarcinomas most commonly occur at pylorus/antrum (74%) followed by body (22.2%). In non-neoplastic lesions chronic gastritis (21.7%) was common followed by polyp and gastric ulcer. Most of them occur at pylorus/antral region. Majority of the adenocarcinomas were moderately differentiated Adenocarcinomas(74%) followed by poorly differentiated adenocarcinomas(14.8%).

Endoscopic Pictures

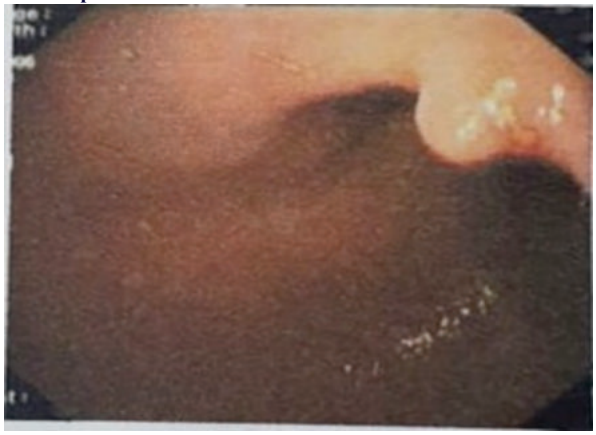

Figure 1- Endoscopy View Gastric Polyp Polypoidal Growth

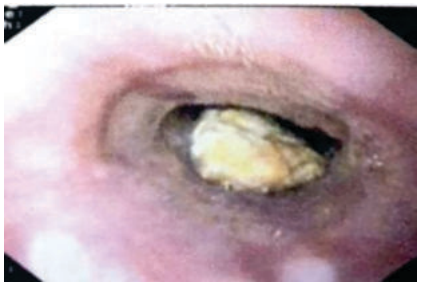

Figure 2- Endoscopy View Carcinoma Esophagus Proliferative Growth Seen In Lower Part Of Esophagus.

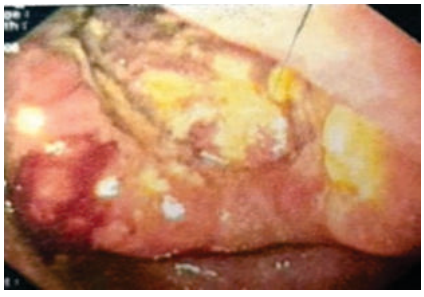

Figure-3 Endoscopic View, Carcinoma Stomach, Ulcerative Lesion

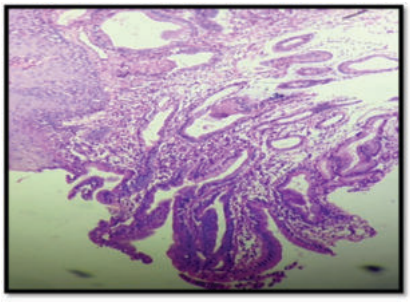

Figure-4 H&e Stain 10x Showing Barrett Esophagus Associated With Intra Mucosal Adenocarcinoma

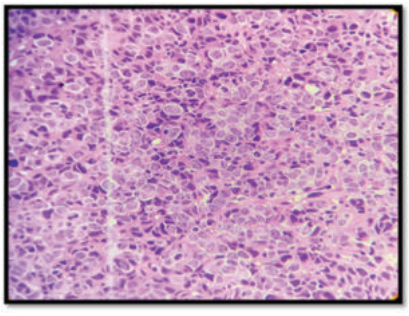

Figure-5 H&e Stain 40x Showing Moderately Differentiated Squamous Cell Carcinoma Of Esophagus

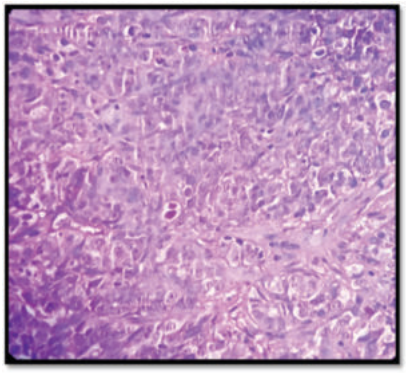

Figure-6 H&e Stain 40x Showing Poorly Differentiated Squamous Cell Carcinoma Of Esophagus

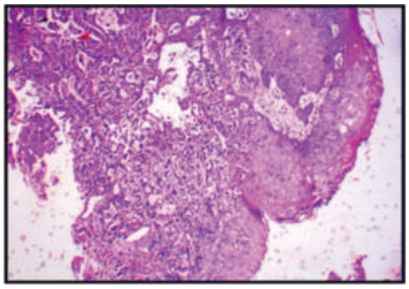

Figure-7 H&e Stain 10x Showing Adenosquamous Carcinoma Of Esophagus

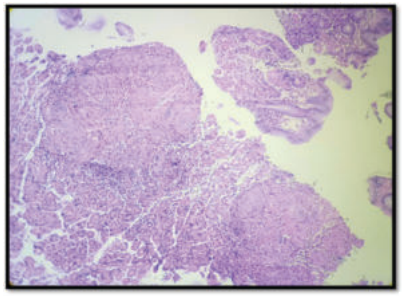

Figure8- H&e Stain 10x Showing Caseating Granuloma In Chronic Gastritis

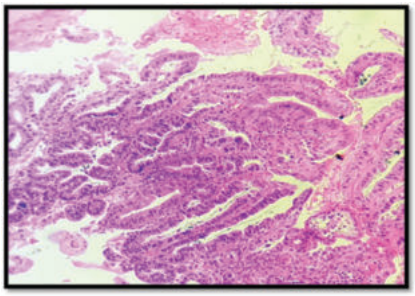

Figure 9-H&e Stain 10x Showing Well Differentiated Adenocarcinoma Of Stomach

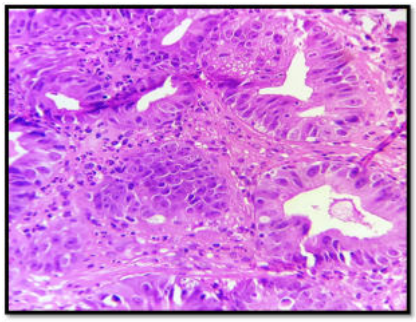

Figure 10--H&e Stain 40x Showing Moderately Differentiated Adenocarcinoma Of Stomac

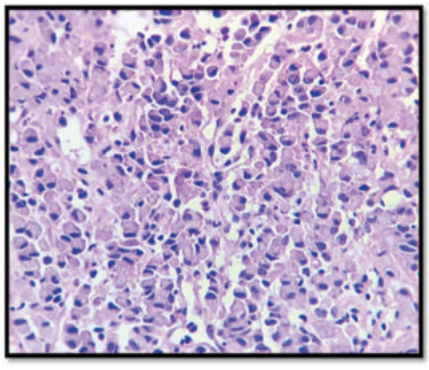

Figure 11-H&e Stain 40x Showing Eccentrically Placed Nucleus In Signet Ring Cells

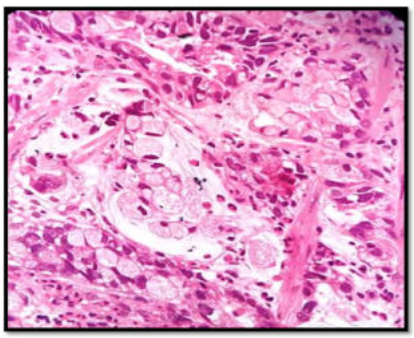

Figure 12-H&E Stain 40x Showing Mixed Gastric Adenocarcinoma

DISCUSSION:

Upper gastrointestinal tract is a common site for neoplasms, especially malignant tumours. Worldwide, gastric adenocarcinoma is the second most common cancer, and carcinoma oesophagus is the sixth leading cause of death.

Upper gastro-intestinal symptoms like dyspepsia, dysphagia, vomiting, abdominal pain, etc are a very common cause of discomfort among patients & form the common reasons for referral to the endoscopy department.

Bozzini and others in 1795 performed the first endoscopy with help of a wax candle enclosed in a tin tube. He recognized the need to build a light source. Kussmaul and others in 1868 introduced the first rigid gastroscope after watching a sword swallower on whom he performed his first gastroscopy.

Nilze and others in 1887 introduced a miniature electric bulb as a light source. Chevalier Jackson performed gastric biopsy using forceps through rigid esophagoscope in 1906. The rigid scopes used had many disadvantages such as considerable skill was required to pass the scope, general anesthesia was a must, and there was added difficulty in passing the scope in cases with chest and neck deformities. Also, the overall biopsy rate was barely over 50%, therefore newer developments were necessary.

The fiber optic endoscope was introduced by Hirschovitz and others. The fiber optic endoscope is made up of thousands of 10 micrometer diameter glass fibers whose extreme ends are cemented by resin and the rest left unbound to allow flexibility A pan endoscope is a forward viewing fiber endoscope with complete tip control and sufficient length allowing examination of the oesophagus, stomach, and duodenum. It has got all automatic controls for air and water suction providing a clear field in the presence of mucous, food particles or even in active bleeding.

Now recently capsule endoscopes have been introduced which are swallowed by the patient. These then take multiple pictures as they pass along GIT. These pictures are later visualized and diagnosis can be made.

The modern endoscope has evolved from a rigid hollow metal tube to a light, flexible fibreoptic system using self illumination. It not only allows the inspection of the GIT, but also permits ease of access to suspected tissue areas with the aid of a biopsy forcep.

Endoscopy provides a unique opportunity to visualize the mucosal surface of the gastro intestinal tract and examination by a qualified pathologist of specimens obtained at endoscopy is a routine and critical part of managing disorders of the alimentary tract.

Endoscopy, when combined with biopsy is an easy, minimally invasive & cost effective procedure when it comes to arriving at a specific diagnosis of a patient with non-specific symptoms.

The present study included endoscopic biopsies which were studied with respect to age , sex distribution, site-wise distribution, presenting complaints & endoscopic findings.

The present study comprises of 100 cases of upper gastro intestinal tract endoscopic was carried out in the Department of Pathology, Chalmeda Anand Rao institute of Medical sciences, Karimnagar over a period of 18months.

The biopsies that were included in the study comprised of 35 oesophageal biopsies & 46 gastric biopsies. The remaining were 9 duodenal biopsies & 10 biopsies from GEJ.

These lesions were then classified as non-neoplastic lesions which comprised 30 cases & neoplastic lesions which comprised 70 cases. Patients with upper GI lesions presented in the age range of 3rd to 9th decade, the youngest patient being 27 years of age & oldest being of 82 years.

The non-neoplastic lesions included cases of chronic gastritis, gastric ulcers , polyps & chronic non specific duodenitis . The peak age group of non-neoplastic lesions was found to be 51-60 years .

The neoplastic lesions were most commonly seen in 51-60 years age group, similar to a study done by Vidyavathi K et al[4] & Bazaz- Malik et al[5] where the peak age group of upper GI neoplasms was found to be 51-60 years & 31-60 years respectively. A study done by Hammadi et al[6] showed a peak age incidence of 45-54 years.

Overall, the upper GI lesions were more common in males with 68% and in females 32% out of 100 cases which is similar to study done by Shennak MM et al[7] and krishnappa R et al[8]. The male female ratio is 2.1:1 Gastritis is more common in males (66.6%) in the present study similar to Afzal et al[9] but in contrast to Adisa et al[10] where it was more common in females.

In the present study, gastric polyps, duodenitis and gastric ulcer show male preponderance.

Overall, the neoplastic lesions were common in males (68.5%) similar to Vidyavathi et al[4] (64%). Dysplasia was found to be more common in males (60%) with a male-female ratio of 1.5:1, which was similar to Lee et al[11] i.e. 1.57:1 Stomach & GEJ: Adeno carcinomas were common in males(71.4%) with a male-female ratio of 2.5:1 in the present study similar to that of Krishnappa et al[8] The commonest presenting complaint was pain (38%) followed by dysphagia(27%) and vomiting in the present study.

Chronic gastritis presented as pain (66.6%) in contrast to dyspepsia in a study by Al-Ammar et al[12]. Chronic no specific duodenitis presented with dyspepsia and pain (44.4%).

In the present study, the most common presenting symptom of neoplastic lesions was dysphagia (38.5%) followed by vomiting and pain (28.6%) similar to that found by Hammadi et al[6].

Dysphagia (80.8%) was highest among squamous cell carcinoma of the esophagus, similar to other studies by Pedram et al[13], Gadour MO et al[14], Verma P et al [15]and Durrani AA et al[16].

Pain(54.3%) was common symptom of gastric carcinoma followed by vomiting (34.4%) similar to that of Durrani AA et al[16] and Sivagamani et al.[17]

The endoscopic findings in the present study were classified as ulcerative, ulcero proliferative, polypoidal and thickened mucosa. The most common endoscopic finding of non-neoplastic lesions was thickened mucosa (58.3%) followed by ulcerative lesion (41.7%) and. All the polyps presented as polypoidal growths within the gastric lumen. Ulcerative lesion is seen in case of chronic gastritis, gastric ulcer. Chronic Duodenitis presented with mucosal thickness(77.8%).

In the present study, the most common endoscopic finding of upper GI neoplasms was ulcero proliferative (57.1%) followed by ulcerative (41.5%), similar to that found in study by Vidyavathi et al[4].and Praveen K et al[18] The most common endoscopic finding was ulceroproliferative lesion in squamous cell carcinoma was (61.5%) and adenocarcinoma (65.5%) similar to that of study done by Krishnappa R et al[8].Among non-neoplastic lesions chronic Gastritis(40%) was more common followed by chronic non specific Duodenitis(30%).

Among neoplastic lesions adenocarcinomas (50%) was more common followed by squamous cell carcinoma (37.1%)

1) Esophagus

The most common lesion of esophagus was found to be squamous cell carcinoma (74.4%) followed by dysplasia(11.5%) & Barrett esophagus(8.5%).

The most common site for esophageal lesions was found to be middle one-third (57.6%) followed by lower one- third (27.1%) and upper one third (15.3%).in the present study which is similar to other studies by Krishnappa R et al[8] and Paymaster et al[19].

In present study squamous cell carcinoma was 74.4% similar to that of Durrani et al[16](69%). In other studies, Joshi et al[20] (92.5%) and Verma et al[15] (94.02%). were Squamous cell carcinoma.

Squamous cell carcinoma occurs mostly occurs in middle third of esophagus (57.6%) similar to that of Krishnappa .R et al[8.] The most common histological type was moderately differentiated squamous cell carcinoma (88.4%). These findings were similar to those published by Pedram et al[13] , Rumana et al[21] and Vidyavathi et al[4].

2) Gastroesophageal junction

Gastro esophageal junction shows Adenocarcinoma (70%) followed by chronic gastritis (20%) and polyp (10%).

Most of the adenocarcinomas was moderately differentiated (85.3%) followed by poorly differentiated (14.7%)

3) Stomach:

The most common lesion of the stomach was found to be adenocarcinoma (58.7%) followed by gastritis (21.7%), polyp (8.7%) & dysplasia (2.1%).

The adenocarcinomas were commonly seen in the antrum & pylorus (74%) followed by body (22.2%) similar to that noted in Pesic et al.[22] Most of them are adenocarcinomas are moderately differentiated (74%) followed by poorly differentiated (14.8%) The polyps are more common in fundus region similar to that of N.Ljubicic et al[23] and Cao et al[24.]

4) Duodenum

Chronic non specific duodenitis is more common in duodenum similar to that of Abhilash SC et al[25.] Chronic gastritis is associated with H.pylori in 16.6% cases and caseating granuloma in 8.3% cases. Adisa *et al*[10] found H.pylori in 57.2% cases of gastritis.

1 out of 3 cases of Barrett esophagus shows association with candidiasis. Intramucosal adenocarcinomas is seen in one case of Barrett esophagus. Association of candidiasis with esophageal cancer was found in 27% cases by Scott *et al*[26] & 51.8% cases by Bonavina *et al*.[27]

CONCLUSION:

1) The upper GI lesions were divided as non-neoplastic & neoplastic for ease of study & were studied in relation to age & sex distribution, correlation with presenting complaints & endoscopic findings and the presence of any associated lesions.

2) The most common lesions of the upper GIT were stomach followed by oesophagus, GE Junction & Duodenum.

3) Majority of the lesions encountered in the study were neoplastic.

4) Adenocarcinoma was most common neoplastic lesion followed by squamous cell carcinoma.

5) Squamous cell carcinoma was seen solely in oesophagus .They were commonly seen in 5th & 6th decade & were more frequent in males. They were most commonly found in middle third of oesophagus & presented with a history of dysphagia & as a Ulceroproliferative lesion on endoscopy.

6) The other neoplastic lesions include Dysplasia, Barrett Oesophagus and Adenosquamous carcinoma. Barrett oesophagus was associated with candidiasis and Intramucosal adenocarcinoma.

7) The most common non-neoplastic lesion was chronic gastritis followed by chronic non specific Duodenitis .

Conflicts of Interest: None

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