



CLINICO HISTOPATHOLOGICAL STUDY OF UPPER GASTROINTESTINAL TRACT ENDOSCOPIC BIOPSIES

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ABSTRACT

Background: Upper gastrointestinal tract is an important site for wide variety of lesions especially malignant tumors. Endoscopy in combination with endoscopic biopsy plays an important role in the diagnosis of upper gastrointestinal tract neoplasms and therefore aids in their early management.

Aim: To study the histopathology of upper Gastrointestinal endoscopic biopsies and correlate them with clinical presentation, age, sex and to find the density of *Helicobacter pylori* in gastritis, gastric ulcers and duodenal ulcers.

Methodology: A two and a half year observational study was carried out on 132 upper Gastrointestinal endoscopic biopsies. Endoscopic upper Gastrointestinal biopsies were fixed in 10% formalin overnight before processing. Routine Hematoxylin & Eosin stain and a special stain Giemsa was done to detect *H. pylori*.

Results: Out of total 132 upper Gastrointestinal endoscopic biopsies, 37 were from esophagus, 13 from Gastrointestinal junction, 75 from stomach and 7 from Duodenum. Squamous cell carcinoma was more common in esophagus (89%), adenocarcinoma in Gastrointestinal junction (61.5%) and Gastritis in 56% of patients. Dysphagia was common symptom in patients of Squamous cell carcinoma (100%), epigastric pain in patients of adenocarcinoma (42.9%), dyspepsia in gastritis patients (71.4%). Squamous cell carcinoma, adenocarcinoma and gastritis was more common in the age group of 41-60 years with male predominance (66.7%, 84.6% and 69% respectively). *Helicobacter pylori* gastritis was present in 32 cases (76.1%) while *Helicobacter pylori* negative gastritis was present in 10 cases (23.8%). Two duodenal ulcer cases were *Helicobacter pylori* positive (100%) and one gastric ulcer case was *Helicobacter pylori* positive (33.3%).

Conclusion: The endoscopic biopsy not only permits exact diagnosis of specific entity but also provide an opportunity to see *H. pylori* status and plans for specific medical or surgical therapy. However histopathological study detects mucosal lesions at an early stage especially atrophy, intestinal metaplasia and dysplasia as to prevent progress of these lesions to invasive cancer.

Key Words: Endoscopic biopsies, Upper gastrointestinal tract, Squamous cell carcinoma, Adenocarcinoma

INTRODUCTION

Upper gastrointestinal tract is a common site for neoplasms, especially malignant tumours. Worldwide, gastric adenocarcinoma is the second most common cancer, and carcinoma esophagus is the sixth leading cause of death.^{1,2} In India, according to the National Cancer Registry, esophageal and gastric cancers are the most common cancers found in men, while esophageal cancer ranks third among women after carcinoma of breast and cervix.³

Squamous cell carcinoma of esophagus is usually seen in the middle third. Squamous cell carcinomas of the oesophagus

emerges mainly through a sequence of chronic-esophagitis, progressive dysplasia, carcinoma in situ, finally invasive carcinoma (Munoz et al. 1982). In the stomach, the great concern is to pick the early gastric lesions on histopathology of the gastric mucosal biopsies (early gastric cancer) that does not extend beyond the mucosa or submucosa even though there may be lymph node metastasis in contrast to the invasive gastric carcinoma which extend beyond muscularis propria where the prognosis is poor.⁴

Endoscopy provides numerous small mucosal biopsies to diagnose and monitor the course of a variety of gastrointestinal tumours. It allows for biopsy under direct vision and

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opportunity arises from improved correlation of histologic features with gross features of the disease in both early and advanced phases.

Thus, the role of upper gastrointestinal mucosal biopsies for the histopathological identification of the earlier stages of various gastrointestinal tumours by endoscopy allows an early therapeutic decisions without unnecessary delay.

Helicobacter pylori (*H. pylori*) are found more frequently within the mucus layer and in the gastric pits, on electron microscopy the organisms are adherent to the surface epithelial cells. The organisms are often visible on Hematoxylin and Eosin staining, though are more easily seen with a Giemsa stain, which is useful in detecting small numbers. Warthin Starry Stain demonstrates *H. pylori* well but is expensive and seldom used in routine work.^{5,6}

It has been confirmed that the development of gastric cancer spans several decades sequentially starting from the *H. pylori* infection, development of chronic active gastritis to development of glandular atrophy and intestinal metaplasia in a subset of patients.⁷

The Sydney system for the classification of gastritis emphasizes the importance of topographical, morphological and etiological information.⁸ This system was revised at the Houston Gastritis Workshop held in 1994. The histological severity of *Helicobacter pylori* density, inflammation, activity, atrophy and intestinal metaplasia were graded according to the updated Sydney system.⁹

AIMS AND OBJECTIVES

- Study the histopathology of endoscopic biopsies of upper gastrointestinal tract.
- Study the correlation between various histopathological lesions of upper gastrointestinal tract with age, sex and clinical presentation.
- Study the *Helicobacter pylori* density in Gastritis, Gastric ulcers and Duodenal ulcers.

MATERIALS AND METHODS

The study was conducted in the Postgraduate Department of Pathology, Government Medical College, Srinagar on 132 upper gastrointestinal endoscopic biopsies performed at Shri Maharaja Hari Singh (SMHS) and its associated hospitals during two and half year period from January 2011 to June 2013.

Brief clinical data was noted from the case records, which included the age, sex and presenting symptoms of the patients.

Biopsies obtained were oriented, fixed in 10% neutral formaldehyde and routinely processed. Approximately 5µm

thick serial sections were cut and stained with hematoxylin and eosin (H&E). In addition, a special stain Giemsa was performed to confirm the presence of *H. pylori*.

For detection of *H. pylori* induced lesions, the surface epithelium and foveolar lumen were searched for curved bacilli in H&E. Giemsa stain was used to facilitate their recognition. Organisms were searched under oil immersion (100X).

The sections were examined for various histopathological features related to gastritis like chronic and mixed inflammatory infiltrates, neutrophilic activity, intestinal metaplasia, atrophy, and presence of *H. pylori*. The sections were also examined for the presence of malignant changes. The findings were then correlated with the age, sex, and clinical presentation.

Inclusion Criteria

- All upper gastrointestinal endoscopic biopsies performed at SMHS and its associated hospitals and referred to Postgraduate Department of Pathology, Government Medical College, Srinagar.
- Lesions present in oesophagus, stomach and up to second part of duodenum (D2).

Exclusion Criteria

- Patients presenting with lesions in the oral cavity and pharynx.
- Patients presenting with lesions beyond the second part of duodenum (D2).

OBSERVATIONS AND RESULTS

The present study included 132 upper GIT endoscopic biopsies between the period January 2011 to June 2013. The following results were observed

Table 1: Age distribution of the studied patients

Age (Years)	Frequency	Percentage
<20	4	3.0%
21 - 40	13	9.8%
41 - 60	65	49.2%
61 - 80	45	34.1%
>80	5	3.8%
Total	132	100%
Mean ± SD	59.11 ± 13.78	
Min - Max	16 - 90 yrs	

Table 2: Gender distribution of the studied patients

Gender	Frequency	Percentage
Male	97	73.5%
Female	35	26.5%
Total	132	100%

Table 3: Chief Complaints in the studied patients

Chief Complaints	Frequency	Percentage
Dyspepsia	50	37.9%
Dysphagia	40	30.3%
Epigastric pain	24	18.2%
Hematemesis	8	6.1%
Post prandial distention(P.P distention)	4	3.0%
Recurrent vomiting	6	4.5%
Total	132	100%

Table 4: Frequency and percentage of individual histopathological diagnosis

Histopathological diagnosis	Frequency	Percentage
Adeno squamous carcinoma	1	0.8%
Barrets esophagus	4	3.0%
Celiac disease	2	1.5%
Chronic non-specific duodenitis	3	2.3%
Duodenal Ulcer	2	1.5%
Gastrinoma	1	0.8%
Gastric ulcer	3	2.3%
Mild gastritis	18	13.6%
Moderate gastritis	24	18.2%
Well differentiated squamous cell carcinoma	8	6.1%
Moderately differentiated squamous cell carcinoma	22	16.7%
Poorly differentiated squamous cell carcinoma	3	2.3%

Well differentiated adenocarcinoma	10	7.6%
Moderately differentiated adenocarcinoma	20	15.2%
Poorly differentiated adenocarcinoma	9	6.8%
Reflux esophagitis	1	0.8%
Xanthoma	1	0.8%
Total	132	100.0%

Table 5: Gender wise distribution of individual histopathological diagnosis

Histopathological diagnosis	Total	Gender	
		Female	Male
Gastric ulcer	3	1 33.3%	2 66.7%
Adeno Ca.	39	6 15.4%	33 84.6%
Adeno squamous Ca.	1	0 0.0%	1 100.0%
Barrets esophagus	4	3 75.0%	1 25.0%
Celiac disease	2	0 0.0%	2 100.0%
Chronic non-Sp.Duoden.	3	0 0.0%	3 100.0%
Duodenal ulcer	2	0 0.0%	2 100.0%
Gastrinoma	1	0 0.0%	1 100.0%
Gastritis	42	13 31.0%	29 69.0%
Reflux esophagitis	1	1 100.0%	0 0.0%
SCC	33	11 33.3%	22 66.7%
Xanthoma	1	0 0.0%	1 100.0%

Ca = Carcinoma; Sp = Specific; Duoden. = Duodenitis; SCC = Squamous cell carcinoma

Dysphagia was common complaint (100%) in patients of squamous cell carcinoma, epigastric pain in adenocarcinoma patients(35.9%), dyspepsia was common in celiac disease(100%),duodenal ulcer(100%) gastritis(71.4%) patients.

Out of total 42 cases of gastritis H. pylori was present in 32(76.2%) with grade 1 in 20(47.6%) and grade 2 in 12(28.6%). H. pylori was absent in 10(23.8%) gastritis patients. Out of 3 gastric ulcer cases, one (33.3%) was H. pylori present and out of 2 duodenal ulcer patients 2(100%) were H. pylori positive.

Out of 32 H. pylori positive gastritis cases, 3 cases (9.4%) have chronic inflammatory infiltrate and 29 cases (90.6%) have mixed inflammatory infiltrate. While as 10(100%) H. pylori negative gastritis cases have chronic inflammatory infiltrate.

Of total 32 H. pylori positive chronic gastritis, 28 cases (87.5%) show activity while out of 10 cases of H. pylori gastritis cases only 2 cases (20%) shows activity.

Out of total 32 H. pylori positive gastritis, atrophy was present in 22 cases (68.75%) with mild atrophy in 20 cases (62.5%) and moderate in 2 cases (6.3%) and out of total 10 H. Pylori negative cases, 4 cases (40%) shows mild atrophy.

Out of total 32 H. pylori positive gastritis cases 10 cases(31.2%) shows intestinal metaplasia with 9 cases (28.1%) of mild and 1 case (3.1%) of moderate intestinal metaplasia and out of total 10 H. pylori negative cases 4 cases (40%) shows mild intestinal metaplasia.

PHOTO MICROGRAPHS

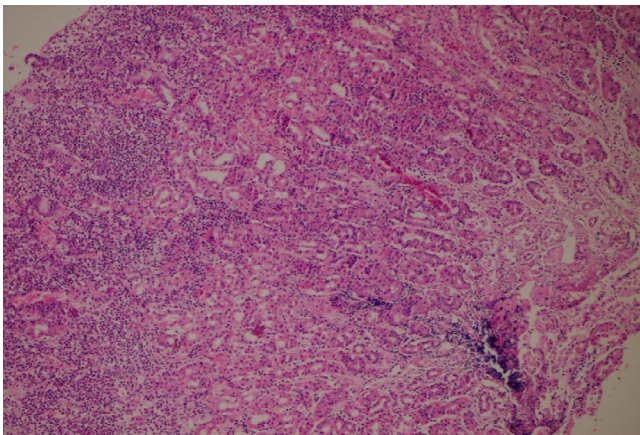


Photo micrograph of Chronic gastritis (H&E stain) 10X
(Image-1.)

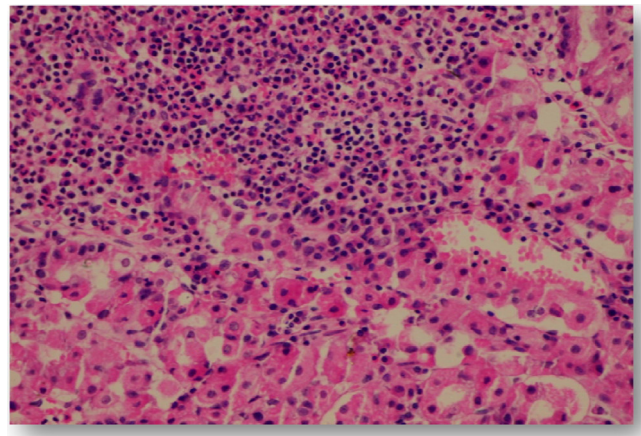


Photo micrograph of gastritis (H&E stain) 40X
(Image-2)

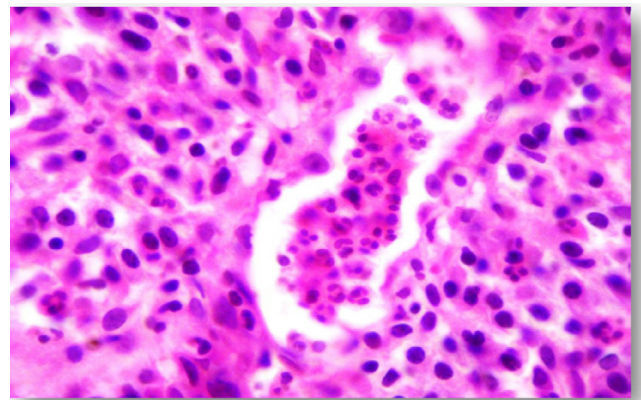


Photo micrograph of Gastritis with activity (H&E stain)
40X.
(Image-3)

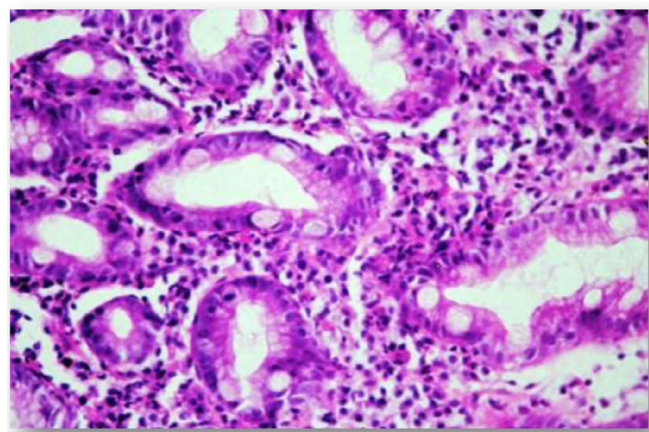
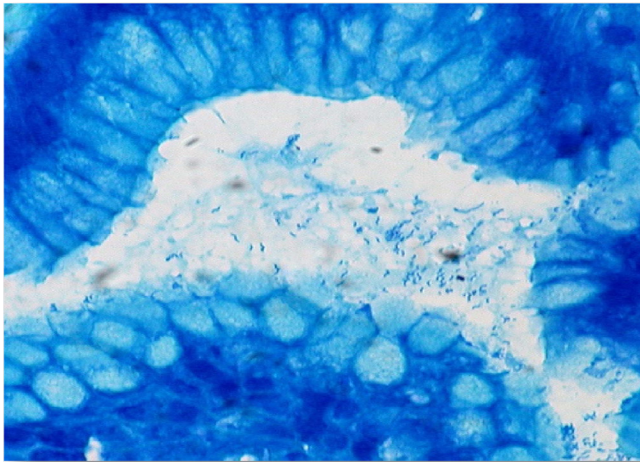


Photo micrograph of Gastritis with intestinal metaplasia
(H&E stain) 40X.
(Image-4)



Photomicrograph of Helicobacter Pylori organisms (Giemsa stain) 100X (Image-5)

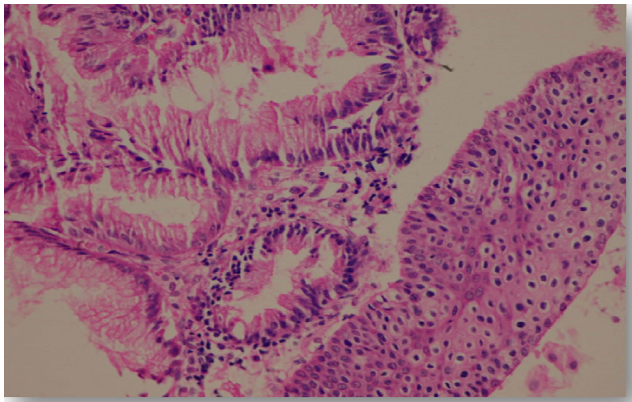


Photo micrograph of Barret's Esophagus (H&E stain) 40X (Image-6)

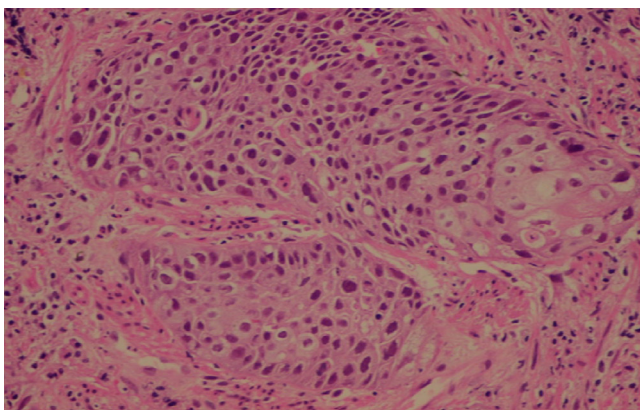


Photo micrograph of squamous cell carcinoma esophagus (H&E stain) 40 X (Image-7)

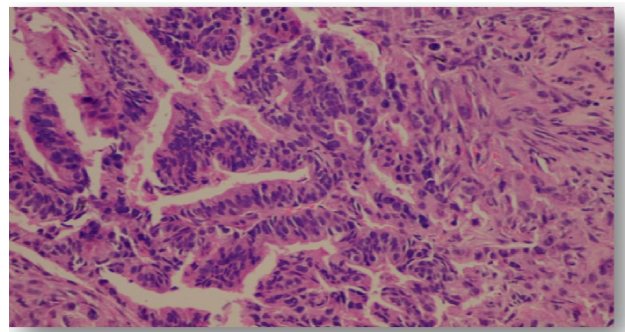


Photo micrograph of Well differentiated adenocarcinoma stomach (H&E stain) 40X (Image-8)

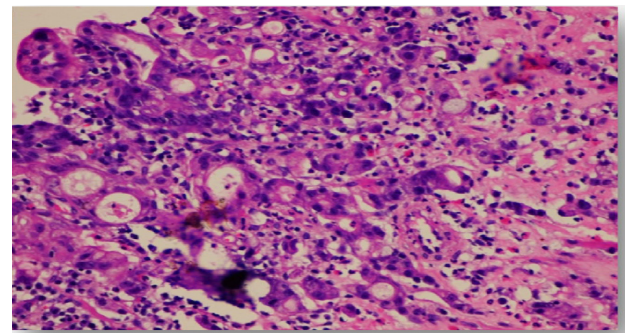


Photo micrograph of Poorly differentiated adenocarcinoma stomach (H&E stain) 40X (Image-9)

DISCUSSION

In the present study, a total number of 132 endoscopic biopsies from the upper gastrointestinal tract were received in the Post graduate Department of Pathology, at Government Medical College Srinagar. The present study was carried out for a period of 30 months, from 1st January 2011 to 30th June 2013.

The study included 37 esophageal biopsies, 13 gastroesophageal junction biopsies, 75 stomach biopsies and 7 duodenal biopsies.

Sex distribution of all cases:

Of the 132 patients with upper gastrointestinal tract endoscopic biopsies, 26.5% were females and 73.5% were males. This was also proved by another study done by Shennak MM et al¹⁰. The male: female ratio was 2.8: 1. This gender ratio favoring males could be reflective of the fact that males are exposed to more risk factors than females and gastrointestinal malignancies are more common in males according to JC Paymaster et al¹¹ or due to large number of male patients attending outpatient department of the hospital as compared to female patients.

TABLE 6: Incidence of SCC of the esophagus with genders

	Total No. of patients	Male:Female
Sons HU & Borchard F ¹²	171	1.6:1
Wang J et. al. ¹³	51	1.8:1
Ahmad Mohd Afroz et al ¹⁴	34	3.4:1
Present study	33	2:1

In the present study, sex distribution of squamous cell carcinoma esophagus correlates with the study Wang J et al¹³.

Table 7: Incidence of adenocarcinomas with genders

Author (Year)	Adenocarcinoma (M:F)
Leena Devi et al (1980) ¹⁵	3.5:1
Durrani et al (2009) ¹⁶	1.4:1
Sujata Metan et al ¹⁷	6:1
Present study.	5.5:1

Our incidence of gender ratio of adenocarcinomas matches with that of Sujata Metan et al¹⁷.

Table 8: Age range of adenocarcinomas in various studies

	Age in years
Vidyavathi K ¹⁸	51-60
Khan MI et. al. ¹⁹	24-82
Ahmad Mohd Afroz ¹⁴	45-80
Present study	41-60

Chief complaints of all cases:

In the present study the most common complaints were dyspepsia (37.9%), dysphagia (30.3%) followed by epigastric pain (18.2%), hematemesis (6.1%), recurrent vomiting (4.5%) post prandial distension (3%). Dysphagia was common symptom in patients of SCC (100%), same was reported by Kumar MK (1973)²⁰, Gadour et al (2004)²¹

Epigastric pain in patients of adenocarcinoma (35.9%), followed by dysphagia (17.9%), dyspepsia (15.4%), recurrent

vomiting (15.4%). Similar symptoms were reported by Gadour et al (2004)²¹, Sivagamani et al (1974).²²

Table 9: Relationship of H.pylori with Neutrophilic Activity

	Total No. of H. pylori positive cases.	Percentage of cases showing activity
E.J Kuipers et al (1995) ²³	58	29 (50.4)
Ohkuma et al (2000) ²⁴	101	101 (100)
Rajesh Kumar et al (2006) ²⁵	92	87 (94.5)
Present study	32	28 (87.5%)

Table 10: Relationship of H.pylori with Intestinal Metaplasia

	No. of H. Pylori positive cases	Percentage of intestinal metaplasia
M.E. Craanen et al (1992) ²⁶	289	135 (46.71)
E.J. Kuipers et al (1995) ²³	58	16 (28)
Ohkuma (2000) ²⁴	101	53 (32.5)
Present study	32	10 (31.25%)

Table 11: Relationship of H. Pylori with Glandular Atrophy

	Total No. of H. Pylori positive cases	Percentage of cases showing gastric atrophy
M.Rugge et al (1993) ²⁷	71	4 (5.6)
E.J. Kuipers et al (1995) ²³	58	16 (28)
Ohkuma (2000) ²⁴	101	64 (39.2)
Oksanen (2000) ²⁸	77	31 (40.2)
Present study	32	22 (68.75)

CONCLUSION

- Squamous cell carcinoma was a common malignancy histologically diagnosed from esophagus.
- Dysphagia was a common clinical presentation of squamous cell carcinoma cases.
- Adenocarcinoma was a common malignancy histologically diagnosed from gastroesophageal junction.

- Epigastric pain was a common clinical presentation of adenocarcinoma cases.
- Histologically diagnosed gastritis was common from stomach and dyspepsia was a common clinical presentation of gastritis cases.
- Histologically diagnosed chronic non-specific duodenitis was common from duodenum and dyspepsia was a common clinical presentation.
- Helicobacter pylori was seen in maximum number of gastritis and duodenal ulcer cases.
- Majority of H. pylori gastritis cases show mixed inflammation, neutrophilic activity and glandular atrophy.

Thus the endoscopic biopsy not only permits exact diagnosis of specific entity but also provide an opportunity to see H. pylori status and plans for specific medical or surgical therapy.

However histo pathological study detects gastric mucosal lesions at an early stage especially atrophy, intestinal metaplasia and dysplasia so as to prevent progress of these lesions to invasive cancer.

Conflict of interests

The author(s) have not declared any conflict of interests.

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