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Histopathological Study of Upper Gastrointestinal Endoscopic Biopsies-1 Year Prospective Study

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Abstract

Objective: Endoscopy of the gastrointestinal tract is a simple safe and well tolerated procedure, the visualisation of the site with biopsy leads to the early detection of the pathologic process and institution of appropriate therapy. The present study was done to find out the morphological pattern and frequencies of lesions reported in upper gastrointestinal tract endoscopic biopsy specimens.

Methods: This was a prospective study conducted on 200 Upper Gastrointestinal Tract endoscopic biopsies in the Department of Pathology from November 2015 to November 2016.

Results: Out of 200 endoscopic biopsies, Male to Female ratio was 1.5:1 and age range of 16-95 years was observed. There were 48 cases (24%) from esophagus, 22 (11%) cases from GE junction, 110 (55%) cases from stomach and 20 cases (10%) from duodenum. 13 cases revealed no pathology on histopathology. 93 cases (46.5%) cases were neoplastic and 107 (53.5%) were non neoplastic. On histopathologic examination Chronic Gastritis with 48 cases (24%) was the most common lesion found while Squamous cell carcinoma of esophagus with 35cases (17.5%) was the most frequently diagnosed malignant lesion.

Conclusion: Endoscopy is incomplete without biopsy, so combination of methods provides a powerful diagnostic tool for better patient management.

Keywords: Endoscopy; Upper GIT; Biopsy; Histopathology

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Introduction

Lesions of upper gastrointestinal tract are one of the most commonly encountered problems in clinical practise. Upper gastrointestinal lesions include those arising from the esophagus, stomach, and first and second part of duodenum [1]. Upper gastrointestinal endoscopy is regarded as the investigation of choice in patients with upper gastrointestinal tract disorders who present with dyspepsia [2].

The Gastrointestinal flexible fibre optic endoscope was first used in 1968 and proved to be a major breakthrough in the diagnosis of oesophagogastro duodenal lesions [3]. It offers the opportunity for biopsy of neoplastic and non-neoplastic lesions. Endoscopic biopsy examination followed by histopathologic assessment is relatively safe procedure and current gold standard to assess patients with symptoms of upper GIT [4]. The endoscopic biopsies are performed not only for the diagnosis of the disease but also for monitoring the course, determining the extent of a disease, as responses to therapy and for the early detection of complications. As a result, the reasons for obtaining mucosal biopsy from the upper gastrointestinal tract have increased and are no longer performed only for the detection of neoplasm [5]. Histopathological assessment of biopsy material is a major part of the workload of a histopathological laboratory [6].

The present study was done to find out the morphological pattern and frequencies of lesions reported in upper gastrointestinal tract endoscopic biopsy specimens.

Material and Methods

The present study was conducted in the Department of Pathology Government Medical College Srinagar. This was a prospective study conducted on 200 upper GI endoscopic mucosal biopsies over a period of one year from November 2015 to November 2016. Brief clinical data including age, sex and clinical symptoms from case records of patients were documented.

All the biopsy samples were counted for fragments of tissue and immediately put in 10% neutral formalin followed by conventional tissue processing and embedding. Five micron thick sections were cut and slides were prepared. Each section was stained with Haematoxylin and Eosin stain and studied. Additional sections were stained with Giemsa to observe *H. Pylori*, Alcian and Per-iodic Acid Schiff (PAS) stain were performed wherever necessary. Lesions were diagnosed as per WHO classification of gastrointestinal tumour and tumour like conditions.

Results

Out of 200GI endoscopic biopsies, 120 (63.54%) were males and 80 (36.46%) were females: male:female ratio being 1.5:1 (**Table 1**). Age of the patients ranged between 16-95 years with mean age of 56.63 .The youngest patient was 16 years old female with chronic gastritis while the oldest patient was 95 years old female with squamous cell carcinoma esophagus (**Table 2**). The site-wise distribution of endoscopic biopsies was Gastric 110 (55%), Esophagus 48 (24%), GE Junction 22 (11%) and Duodenum 20 (10%). There were 107 (53.5%) non neoplastic lesions and 93 (46.5%) were neoplastic (**Table 3**). Among neoplastic lesions there were 43 cases of adenocarcinoma, 35 squamous cell carcinoma, 1 case of neuroendocrine tumour, 1 case of GIST and 1 case of malignant melanoma.

Distribution of endoscopic biopsies

In **Table 4**, Of 110 Gastric biopsies, 76 (69.09%) were non neoplastic lesions and 34 (30.90%) were neoplastic. The most common non neoplastic lesion was chronic gastritis with 48 cases. (43.63%) (**Figure 1**) Out of these 26 (54.16%) were *H. Pylori* related (**Figure 2**). There were 14 cases of hyperplastic polyp (12.72%) (**Figure 3**). There was 1 (0.90%) case each of Gastric Xanthelsmas, Eosinophillicgastritis, Crohns disease and Metastatic Melanoma (**Figures 4-6**). Adenocarcinoma was the most common neoplastic lesion with 28 cases (25.45%). With respect to differentiation, moderately differentiated adenocarcinoma with 18 cases (64.28%) was slightly more than poorly differentiated lesions with 6 cases (21.42%) followed by well differentiated adenocarcinoma with 4 cases (14.28%). Antrum was the most common site of gastric carcinoma followed by body.

In **Table 5**, Out of 28 cases of adenocarcinoma of stomach, 11 cases (40%) presented with ulcerated growth on endoscopy followed by 10 cases (35%) of ulcer proliferative growth and 7 cases of (25%) ulcer infiltrative growth.

Out of 48 esophageal biopsies, 35 (72.91%) cases showed squamous cell carcinoma, 3 (6.25%) cases of chronic non-specific esophagitis 2 (4.16%) cases each of Barrets. Esophagus, esophageal dysplasia and hyperplastic polyp1 (2.08%) case of squamous papilloma. 3 cases showed non-specific pathology (**Table 6**).

All the malignant lesions of esophagus of were squamous cell carcinoma (**Figure 7**) with male female ratio of 1.18:1. Majority of squamous cell carcinoma were in the lower esophagus 23 (65.71%) followed by middle esophagus 7 (31.81%) and 5 cases in the upper esophagus (14.28%). Majority of esophageal squamous cell carcinoma were moderately differentiated 23 (65.71%) cases followed by 7 cases (20%) of well differentiated squamous cell carcinoma and 5 cases (14.28%) were poorly differentiated (**Figure 8**).

In **Table 7**, Out of 20 duodenal biopsies; there were 6 cases (30%) of non-specific duodenitis 3 cases (15%) of celiac sprue and 2 cases (10%) of duodenal ulcer. Among neoplastic lesions there were 3 cases of tubular adenoma (15%), 2 cases (10%) of adenocarcinoma and 1 case (5%) of carcinoid 3 were of non-specific pathology (15%). Among these 2 cases of celiac sprue were in the paediatric age group and 2 cases of non-specific duodenitis were also in the same age group (**Tables 8 and 9**). Out of 22 cases of GE Junction lesions, there were 13 (59.09%) cases of adenocarcinoma (**Figure 9**), 4 cases (18.18%) of hyperplastic polyp 3 cases of Barrets esophagus (13.63%). 1 case each of dysplasia (4.54%) and reflux esophagitis (4.54%).

Table 1 Site distribution.

Type of Lesion	M	F	Total	Percentage
Esophagus	25	23	48	24%
GE Junction	16	6	22	11%
Stomach	72	38	110	55%
Duodenum	11	9	20	10%
Total	**120**	**80**	**200**	**100%**

Table 2 Age distribution.

Age	No of cases	Percentage
20-Oct	6	3%
21-40	30	15%
41-60	86	43%
61-80	73	36.50%
>80	5	2.50%

Table 3 Frequency of neoplastic and non-neoplastic lesions.

Lesion	Number	Percentage
Neoplastic lesion	93	46.50%
Non neoplastic lesions	107	53.50%
Total	**200**	**100%**

Discussion

Upper gastrointestinal endoscopy is regarded as the investigation of choice in patients with upper gastrointestinal disorders which often present with dyspepsia. Endoscopy is incomplete without biopsy and histopathology is the gold standard for the diagnosis of endoscopically detected lesions [4].

Good clinical and endoscopy information is a fundamental part of adequacy and this strongly reflects how a biopsy should be read. However the precise diagnosis becomes more certain on histopathological examination [4].

The present study was conducted on 200 upper GI tract endoscopies that were received in our department from Nov 2015 to Nov 2016. Most common site for upper endoscopic biopsy was from stomach, followed by esophagus and duodenum. A male to female ratio of 1.5:1 was observed in our study, with majority of patients in the fourth to sixth decade of life (43%) The results of our study were similar to the study carried out by Shennak et al. [7] and Jayshreea [1]. This gender ratio favouring males could

Table 4 Histopathology of gastric lesions.

	Type of Lesion	Male	Female	Total	Percentage
1	Chronic Gastritis				
1a	Chronic Non Specific Gastritis	6	3	9	8.18%
1b	Chronic Superficial Gastritis	8	5	13	11.81%
1c	Chronic Active Gastritis With H Pylori	14	12	26	23.63%
2	Gastric Ulcer	3	1	4	3.63%
3	Gastric Xanthelsmas	1		1	0.90%
4	Eosinophillic Gastritis	1		1	0.90%
5	Crohns Disease	1		1	0.90%
6	Hyperplastic Polyp	9	5	14	12.72%
7	Adenoma	2	1	3	2.72%
8	Intramucosal Carcinoma	1		1	0.90%
9	Adenocarcinoma	21	7	28	25.45%
10	Gist	1		1	0.90%
11	Metastatic Melanoma	1		1	0.90%
12	No Specific Pathology	3	4	7	6.36%
	Total	**72**	**38**	**110**	**100%**

Table 5 Endoscopic and histopathological findings of gastric carcinoma.

Endoscopic Findings	Adenocarcinoma	Percentage
Ulcerative Growth	11	40%
Ulceroproliferative Growth	10	35%
Ulceroinfiltrative	**7**	**25%**
Total	**28**	**100%**

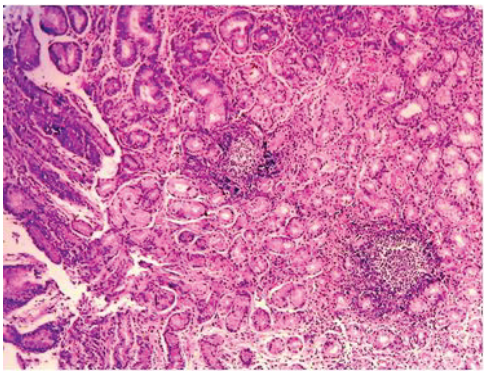

Figure 1 Photoicrograph of chronic gastritis with lymphoid follicle formation (10x).

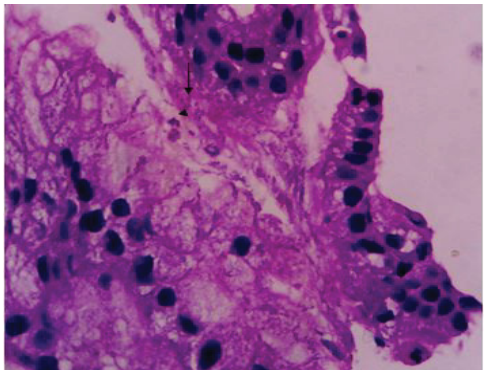

Figure 2 Photomicrograph of *H. Pylori* induced chronic gastritis (40x).

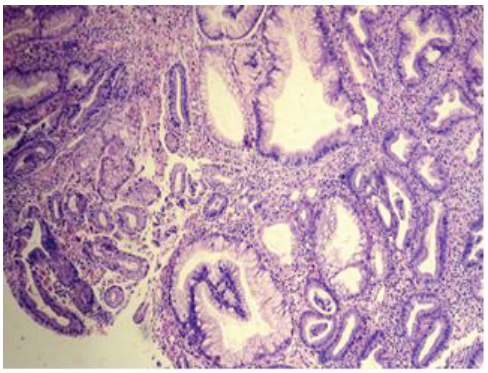

Figure 3 Photomicrograph of gastric hyperplastic polyp showing elongated tortuous glands (10x).

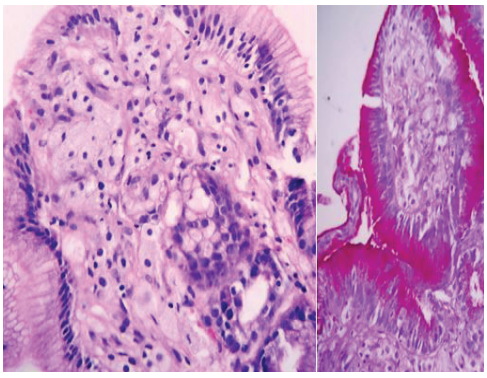

Figure 4 Photomicrograph of gastric xanthelamsas showing lipid laden macrophages in lamina propria (Inset showing PAS negative macrophages) 10x.

be due the fact that males are exposed to more risk factors than females and gastrointestinal malignancies are more common in males. The age related difference could be due to the variation in the risk factors among the different age groups.

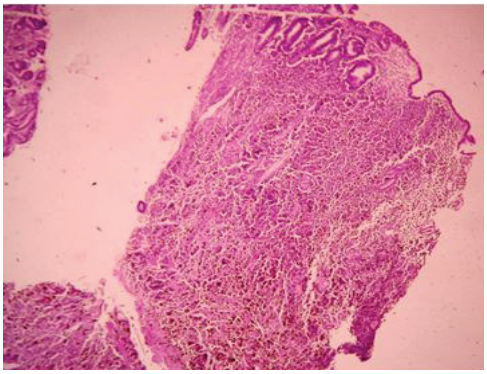

Figure 5 Photomicrograph of metastatic malignant melanoma -stomach showing densemelanin pigment (10x).

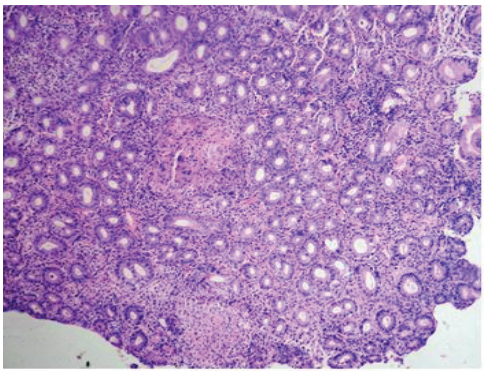

Figure 6 Photomicrograph of chrohns disease stomach showing non caseating epitheloid cell granulomas (Arrows) (10x).

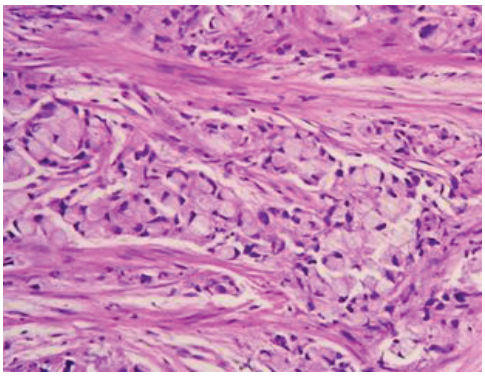

Figure 7 Photomicrograph of signet ring cell carcinoma stomach (40x).

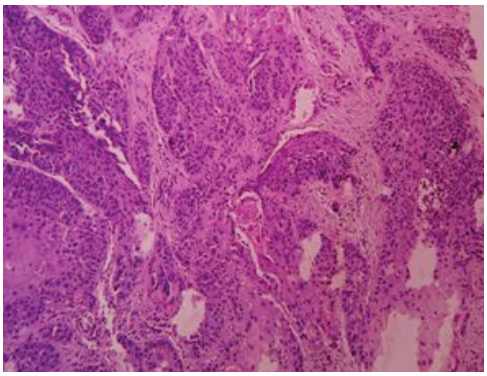

Figure 8 Moderately differentiated squamous cell carcinoma-Esophagus (10x).

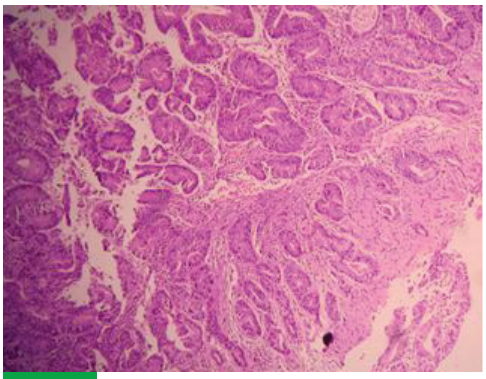

Figure 9 Photomicrograph of well differentiated adenocarcinoma-stomach (10x).

Distribution of Gastric biopsies

In the present study gastric biopsies constituted the majority of upper gastrointestinal cases 110 (43%) with 76 (69.09%) being non neoplastic. Study by Rashmi et al. [5] also showed similar results with 60% being non neoplastic and 40% being neoplastic Chronic gastritis was the most common lesion with 48 cases (43.63%), with 26 cases being with *H. Pylori* related. *H. Pylori* negative chronic gastritis could be due to therapy for *H. Pylori* eradication or failure to see *H. Pylori* in tissue sections [8]. Adenocarcinoma

Table 6 Histopathology of Esophageal lesions.

Type of Lesion	Male	Female	Total	Percentage
Chronic Non Specific Esophagitis	2	1	3	6.25%
Barrets Esophagus	1	1	2	4.16%
Hyperplastic Polyp	1	1	2	4.16%
Esophageal Dysplasia	1	1	2	4.16%
Squamous Papilloma	1		1	2.08%
Squamous Cell Carcinoma	19	16	35	72.91%
Nospecific Pathology		3	3	6.25%
Total	**25**	**23**	**48**	**100%**

Table 7 Histopathology of duodenal lesions.

Type of Lesion	Males	Females	Total	Percentage
Celiac Sprue	1	2	3	15%
Non Specificduodenitis	3	3	6	30%
Duodenal Ulcer	1	1	2	10%
Adenoma	2	1	3	15%
Carcinoid	1		1	5%
Adenocarcinoma	2		2	10%
No Specific Pathology	1	2	3	15%
Total	**11**	**9**	**20**	**100%**

Table 8 Histopathology of GE junction lesions.

Type of Lesion	Male	Female	Total	Percentage
Barrets Esophagus	2	1	3	13.63%
Reflux Esophagitis	1		1	4.54%
Hyperplastic Polyp	3	1	4	18.18%
Dysplasia	1		1	4.54%
Adenocarcinoma	9	4	13	59.09%
Total	**16**	**6**	**22**	**100%**

Table 9 Endoscopic and histopathological findings of Esophageal carcinoma.

Endoscopic findings	Squamous cell carcinoma	Percentage
Proliferative	6	17.14%
Ulceroproliferative	10	28.57%
Ulcerative	7	20%
Ulceroinfiltrative	6	17.14%
Stenosing	6	17.14%
Total	**35**	**100%**

was the next most common lesion with 28 cases (25.45%). Antrum was the most commonest site of gastric carcinoma followed by body of stomach similar to other studies. Study by Abhilesh [9] also showed similar results. Adenocarcinoma was the most common neoplastic lesion in their study with major subsite being pyloric antrum. In our study adenocarcinoma of stomach endoscopically presented as ulcerative growth 40% followed by ulcer proliferative growth 35% proliferative growth 15% and ulcer infiltrative growth 10% Study by Rashmi et al. [5] showed similar results.

Esophageal lesions; among the esophageal biopsies, 7 were non neoplastic lesions ad 38 were neoplastic lesions. Squamous cell carcinoma was the most common malignant lesion in our study. The results of our study differed from other studies in which non neoplastic lesions of esophagus predominated the overall picture [7,9]. The higher incidence of esophageal cancer in this geographical region may probably be due to interplay of various environmental; likely dietary factors with underlying poor nutritional status. Salted tea, prepared by brewing green tea leaves with sodium bicarbonate is a favourite drink among Muslims in Kashmir. It shows high methylating activity upon *in vitro* nitrosation. In addition, other dietary items containing substantial amounts of N-nitroso compounds, such as sun dried vegetables dried fish and red chillies are substantially consumed by this population [10].

Esophageal carcinoma was most commonly seen in lower end (25) 71.42% in our study followed by middle oesophagus (7) 20% and upper oesophagus (3) 8.57%. The finding of our study were similar to the study of Rumana et al. [11] where they studied the changing pattern of esophagogastric cancer in Kashmir and found that there was a trend towards an increase in frequency of cancer at lower end of esophagus and gastroesophageal junction. Squamous cell carcinoma of esophagus endoscopically presented as uceroproliferative in 10 cases (28.57%) ulcerated in (7) 20% cases ulcer infiltrative, stenosing/stricture and proliferative lesion in 6 cases each (17.14%) (Table 9).

Gastroesophageal junction lesions; Of 22 G/E Junction biopsies, 18 were adenocarcinoma which together with squamous cell carcinoma of lower end of oesophagus constituted 43.90% of all malignant lesions of upper GI Tract. Study of Rumana et al. [11] Sheikh et al. [12] and also found an increase in the number of malignancies of the lower end of esophagus and GE Junction 39.8% and 24.36% respectively. There were 4 cases of hyperplastic polyp and 3 cases of Barrets esophagus and 1 case of reflux esophagitis in our study.

Duodenal lesions in upper gastrointestinal tract biopsies; Duodenum has a rich rapidly regenerating epithelial lining which can easily be affected by any inflammatory insult [13] of patients with duodenal biopsies involving first two part of duodenum, 6 cases were nonspecific duodenitis, 3 cases were adenoma and celiac sprue 2 were adenocarcinoma and duodenal ulcer. There was one case of carcinoid in our study. The results of our study was similar to the study done by Abhilesh et al. [5,9] Histopathology was particularly diagnostic in a case of duodenal ulcer

Endoscopic findings in this case was that of an ulcerated lesion-neuroendocrine tumour. But on histopathology it proved out to be a duodenal ulcer with dense inflammation in the wall. So histopathology is considered gold standard in diagnosing upper gastrointestinal lesions.

Conclusion

Endoscopy with assisted biopsy is the gold standard in the diagnosis of upper gastrointestinal tract lesions. Limitations in diagnostic interpretation are encountered at times due to tiny biopsy material, handling and processing artefacts. However, multiple bits of endoscopic biopsies from abnormal looking mucosa are recommended to establish a definitive diagnosis. Endoscopic biopsies can detect changing patterns in the spectrum of lesions besides detecting upper GI mucosal lesions at an early stage especially atrophy intestinal metaplasia and dysplasia so as to prevent progress of these lesions to invasive cancer. We therefore conclude that endoscopy is incomplete without biopsy and so the combination of methods provides a powerful diagnostic tool for better patient management.

Acknowledgements

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