

Histopathological spectrum of upper gastrointestinal endoscopic biopsies

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Article Info

Received: 13th November, 2018

Accepted: 20th February, 2019

Published Online: 9th August, 2019

Keywords: Biopsy, Endoscopy, Histopathology, Upper GI lesions.

Abstract

Introduction: Wide spectrum of benign and malignant lesions can arise from upper gastrointestinal tract and most of the times histopathological evaluation of endoscopic biopsies gets us to definitive diagnosis. Henceforth the present study aims at finding out different patterns of endoscopic biopsies from upper GI tract.

Materials and Methods: The present descriptive study is conducted in a tertiary care hospital for a year from Oct 2014 to Sep 2015 and includes 70 endoscopic gastric biopsies. Study population includes both sexes with ages ranging from 20yrs to 80 yrs.

Results: The Upper GI Endoscopy includes 18 Esophageal of which 7 (38.9%) are neoplastic and 11 (61.1%) are non-neoplastic and particularly SCC is noticed in 5 (71.4%), mostly from the middle third of esophagus. Similarly Gastric biopsies showed 25(71.4%) non neoplastic and 10 (28.6%) neoplastic and the commonest presentation being Adenocarcinoma. H Pylori is present in 10 (40%) and absent in 15 (60%) of all gastric lesions and coming to 15 duodenal biopsies, 10 are non-neoplastic (66.7%) and 5(33.3%) are neoplastic and 4 are adenocarcinomas.

Conclusions: Through this study we summarize that the Upper GI Endoscopy and histopathological examination helps in early detection of mucosal lesions, both benign and malignant and particularly the malignant lesions will help in better management and preventing grave prognosis. Chronic gastritis is most frequently noticed in non-neoplastic lesions and are predominantly H pylori negative.

Introduction

Even though GI Endoscopy is an invasive procedure, it is widely accepted and better tolerated. It helps in direct visualization and accessing the abnormal site for biopsy for further studies. It has been employed in diagnosis of wide spectrum of benign and malignant lesions like infections, inflammatory disorders, vascular disorders, mechanical conditions, toxic and physical reactions including radiation injury and neoplasms.¹

Upper GI cancers are most prevailing cancers with Stomach cancer being 2nd most common cancer among men and 3rd most in females in Asia as well as worldwide.² Carcinoma esophagus which is ranked as 7th most common cancer worldwide has got a overall 5 year survival rate no better than 20%.³⁻⁵ Even in India, The National Cancer Registry says esophageal and gastric cancers are the most common cancers in men and particularly esophageal cancer ranks 3rd among women.⁶

The Upper GI flexible fiberoptic endoscope was first used in 1968 and proved a major breakthrough in the diagnosis of esophago-gastro-duodenal lesions and the histological confirmation of biopsy as most purposeful tool in definitive diagnosis.⁷⁻⁹

Materials and Methods

The present study is a cross sectional study involving 70 consecutive endoscopic biopsies of Upper GI tract and was carried out in the Department of Pathology from Kamineni Institute of Medical Sciences, Narketpally.

Inclusion Criteria

All endoscopic biopsies of the upper gastrointestinal tract (esophagus, esophagogastric junction, stomach and duodenum)

Exclusion Criteria

1. All lesions of the oral cavity.
2. All lesions below the duodenum

After properly identifying patient with personal details and taking brief clinical data, Endoscopic procedures were consummated by the Gastroenterologist and biopsies were taken from relevant places. The biopsy materials were taken in to a bottle with 10% formalin to allow rapid fixation without shrinkage. The fixed material is wrapped in a piece of filter paper and processed in a perforated cassette. Before processing, the samples were stained with eosin for their better & complete visualization & wrapped in a tissue paper

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<http://doi.org/10.18231/j.ijpo.2019.081>

to prevent dispersion & actual loss of tissue. All the bits were embedded together for ideal visualization.

After adequate fixation entire tissue is routinely processed and embedded in paraffin with mucosal surface uppermost. Five micron thick sections are cut perpendicular to this surface and four to five sections are prepared on each slide. Each section is stained with H & E and studied microscopically. In cases of all gastritis, dysplasias and adenocarcinomas additional sections were stained with Giemsa stain to look for the presence of *H. pylori*. An attempt is made to diagnose the lesion on gross visualization during endoscopy and to correlate them histopathologically. Tumors are diagnosed as per WHO histological classification of gastrointestinal tumors.¹⁰

Results

Of the 70 Biopsies, 50% are taken from stomach, 25.7% from esophagus, 21.4% from duodenum and 2.9% from E-G junction. Frequent age group observed is 51-60 followed by 41-50 years. Esophageal neoplasms are seen mainly in 6th – 7th decade, gastric neoplasms in 6th decade and duodenal neoplasms in 5th decade. The study showed male preponderance with 61.5% of total, making Male to Female ratio at 1.59: 1. There were total 23 neoplastic lesions in total with 15 male (65.2%) and 8 female (38.5%) keeping the ration at 1.87:1.

Esophageal Biopsies

Among total 18 esophageal biopsies, 11 (61.1%) are non neoplastic and 7 (38.9%) are neoplastic lesions. The most common endoscopic presentation was congested mucosa (39%) which on histological examination with H & E staining showed the features of GERD/ Esophagitis. One

exophytic growth on endoscopy turned out to be Adenocarcinoma and Two lesions which presented as constricting growth with strictures turned out to be Squamous cell carcinomas.

Subsite of Esophageal Lesions

For esophageal lesions, the commonest site of presentation was the lower one third of esophagus which accounted for 9 out of 18 cases (50%) followed by the middle one-third i.e., 7 /18 cases (38.9%) and upper one third i.e., 2/18 cases (11.1%). Commonest site of esophageal neoplasms is the middle one third (4/7) of the esophagus accounting to 57% of the total malignancies.

Gastric Biopsies

Of 35 biopsies from stomach, 25 (71.4%) were non neoplastic and 10 (28.6%) are neoplastic. The predominant endoscopic finding was erythema/hyperemic patch (36%) followed by polypoidal mucosa (24%) and Erosive mucosa (24%). In non neoplastic lesions, major group 48% showed chronic gastritis followed by Hyperplastic / inflammatory polyp (20%) and gastric ulcers which accounted to 12%. 4 out of 6 biopsies that presented as polypoidal mucosa endoscopically, turned out to be Hyperplastic/Inflammatory polyp histologically and 4out of 6 that presented as erosive mucosa turned out to be chronic gastritis.

The neoplastic lesions were diagnosed as per the WHO classification of gastric tumors. 5 out of 10 neoplasms (50%) were tubular adenocarcinoma, 3/10 (30%) were signet ring carcinomas, 1/10(10%) was papillary adenocarcinoma and the remaining 1(10%) was neuroendocrine/carcinoid tumor.

Table 1: Endoscopic presentation and histopathological diagnosis of esophageal biopsies (n=18)

Endoscopic presentation	Malignant SCC	Adeno	Indefinite for dysplasia	Barret's esophagus	GERD	Total %
Constricting growth as stricture	2	0	0	0	0	2 (11.1%)
Ulcerative	1	0	2	0	1	4(22.2%)
Exophytic	0	1	0	0	0	1(5.5%)
Polypoidal	2	1	0	1	0	4(22.2%)
Congested mucosa	0	0	1	1	5	7(39%)
Total	5	2	3	2	6	18(100%)

Table 2: Endoscopic presentation and histo pathological diagnosis of Gastric biopsies

Endoscopic finding	Chronic gastritis	Gastric ulcer	Hyperplastic polyp	Indefinite for dysplasia	Intestinal metaplasia	Hamartomatous polyp	Total %
Erythema/hyperemic patch	5	0	1	2	1	0	9(36%)
Ulcerative	2	2	0	0	0	0	4(16%)
Polypoidal mucosa	1	0	4	0	0	1	6(24%)
Erosion	4	1	0	0	1	0	6(24%)
Total	12	3	5	2	2	1	25(100%)

The commonest type of endoscopic presentation among the gastric neoplasms observed is an ulcerative type of growth (50%) followed by polypoidal growth (30%) and infiltrative type of growth (20%) which were later diagnosed as carcinomas histologically. Out of 10 cases of gastric neoplasms, 6 are males, and 4 are females with a M:F ratio of 1.5:1 and peak incidence was noted in 6th – 7th decades.

Regional Distribution of Gastric Biopsies

Out of 35 gastric biopsies, 18 (51.4%) were from the antral and pyloric regions, 13(37.2%) were from the body of the stomach and the remaining 4 (11.4%) were from the fundus of the stomach.

Esophago - gastric Junction

The lesions in the Esophago- gastric junction were recorded separately (i.e., not included in either esophageal or gastric lesions). Of the 2 lesions from esophago gastric junction, 1 was non neoplastic and other one was neoplastic - squamous cell carcinoma.

Duodenal Biopsies

Out of total 15 duodenal biopsies, 10 (66.7%) were non neoplastic and 5 (33.3%) were neoplastic. Most common endoscopic presentation of duodenal lesions is multiple nodules (73.3%). 5 out of 11 duodenal lesions that presented

as multiple nodules endoscopically were diagnosed as chronic nodular duodenitis histologically. One duodenal ulcer presented as ulcer and two lesions which presented as ulcerative growth in endoscopy were diagnosed as adenocarcinomas on histology. Among 5 neoplastic lesions of the duodenum, 4 (80%) were diagnosed as adenocarcinoma and 1 (20%) was neuro endocrine tumor. Of total 15 duodenal biopsies, peak incidence is in 3rd and 4th decades followed by 6th decade. Male: Female ratio was 2:1.

H.pylori positivity

Out of total 25 lesions stained for H.pylori, 10(40%) showed positive staining and 15 (60%) showed negative staining.

Discussion

Endoscopic biopsy and subsequent histopathological study stands as one of the best diagnostic modality in making diagnosis of GIT lesions – Neoplastic and Non Neoplastic. The aim of present study is also to demonstrate the same importance with precise statistical study. We have attempted to compare our data with other established studies in literature. Table 5 below depicts the comparison of the site distribution of all the endoscopic biopsies with the other studies.

Table 3: Endoscopic presentation and morphologic spectrum of duodenal lesions (n=15).

Endoscopic finding	Chronic nodular duodenitis	Duodenal ulcer	Brunner gland hyperplasia	Adenocarcinoma	Neuroendocrine tumor	Total
Multiple nodules	5	0	3	2	1	11(73.3%)
Ulcer	0	1	0	0	0	1(6.7%)
Polyp	1	0	0	0	0	1(6.7%)
Ulcerative growth	0	0	0	2	0	2(13.3%)
Total	6(40%)	1(6.7%)	3(20%)	4(26.7%)	1(6.7%)	15(100%)

Table 4: Incidence of H Pylori positivity among lesions of stomach and duodenum (n=25)

Lesion	H.pylori +ve	H.pylori -ve	Total
Chronic gastritis	5	7	12(48%)
Gastric ulcer	2	1	3(12%)
Duodenal ulcer	1	0	1(4%)
Adenocarcinoma of stomach	2	7	9(36%)
Total	10(40%)	15(60%)	25(100%)

Table 5: Comparison of site distribution of endoscopic biopsies with other studies.

Study	Esophagus	Stomach	Duodenum	E-G junction
Sheik BA et al ¹¹ 2015 (n=196)	25.5%	64.8%	2.04%	7.65%
Krishnappa R et al ¹² 2013 (n=100)	25%	68%	7%	-
Panjeta et al ¹³ 2012(n=192)	6.25%	84.05%	3.64%	-
Shennak et al ¹⁴ 1997 (n=1605)	22%	69.8%	8.2%	-
Present study (N=70)	25.7%	50%	21.4%	2.9%

The peak incidence of endoscopic biopsies in the present study was in the 5th and 6th decades. This finding was confirmed by Katiyar V et al¹⁵ and Krishnappa R et al¹² in their study.

Shennak MM et al¹⁴ study showed that peak age incidence was in 4th decade. This difference in the age groups may be because of the geographical variation of the study and the Male: Female ratio of endoscopic biopsies in

the present study is 1.59:1. This finding is similar to those in studies conducted by Katiyar V et al,¹⁵ Krishnappa R et al,¹² Sheik et al,¹¹ Panjeta S et al¹³ and Shennak MM et al¹⁴ which also showed a male preponderance of the endoscopic biopsies. In the study conducted by Krishnappa R et al¹² and Katiyar et al,¹⁵ the male patients were more than two times the female patients.

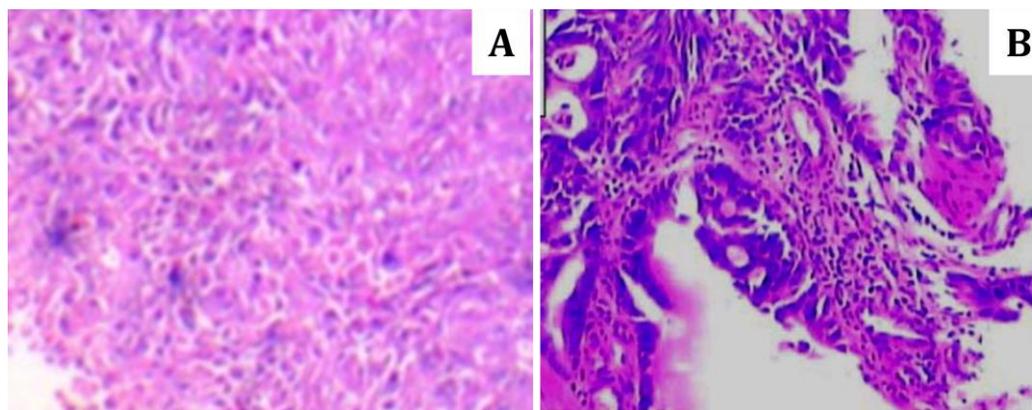


Fig. 1 A: Moderately differentiated Squamous cell carcinoma of esophagus showing pleomorphic cell nests and occasional epithelial pearl formation. (H & E, 10 x); **B:** Adenocarcinoma Esophagus with cells arranged in glandular pattern (H &E, 10 x)

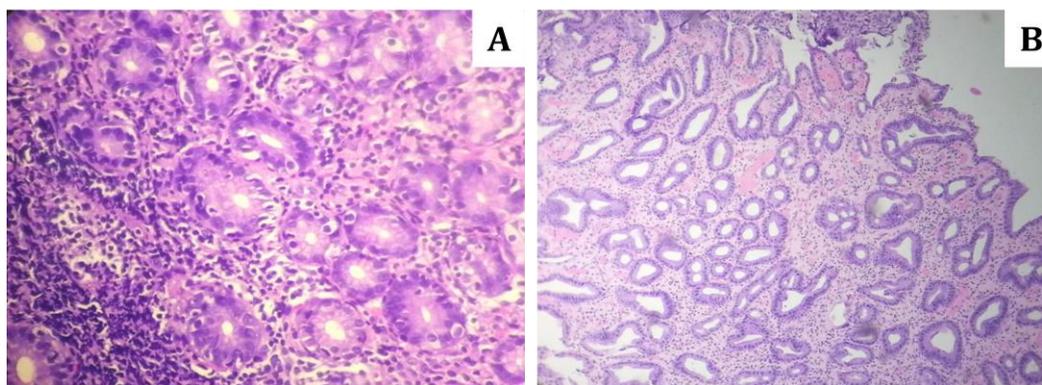


Fig. 2: A: Chronic non specific gastritis showing inflammatory infiltrate in the lamina propria (H &E, 40x); **B:** Gastric polyp showing closely packed glands lined by normal columnar epithelium with mild chronic inflammation in the lamina propria. (H & E 10x).

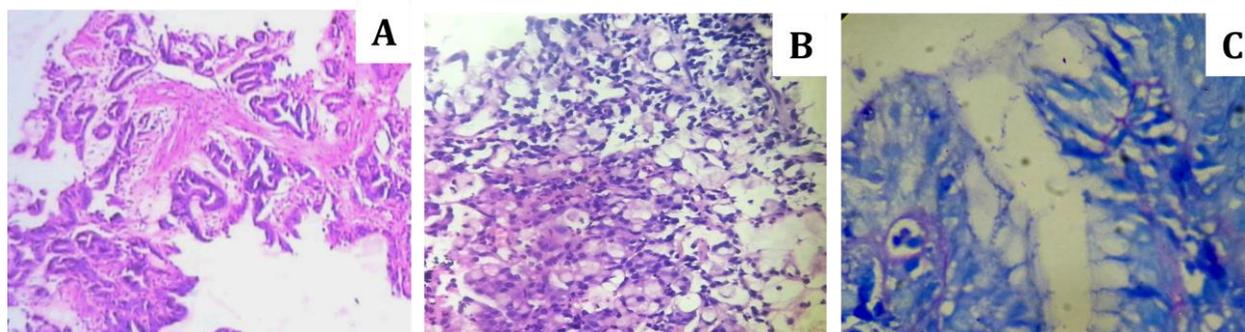


Fig. 3 A: Tubular carcinoma of stomach showing irregular tubules lined by pleomorphic cells (H &E, 40x); **B:** Signet ring carcinoma of the stomach showing atypia, pleomorphism and signet ring cells. (H & E, 40x); **C:** Gastric antral mucosa demonstrating *H. pylori* in the crypts of the gland. (Giemsa stain, 40x)

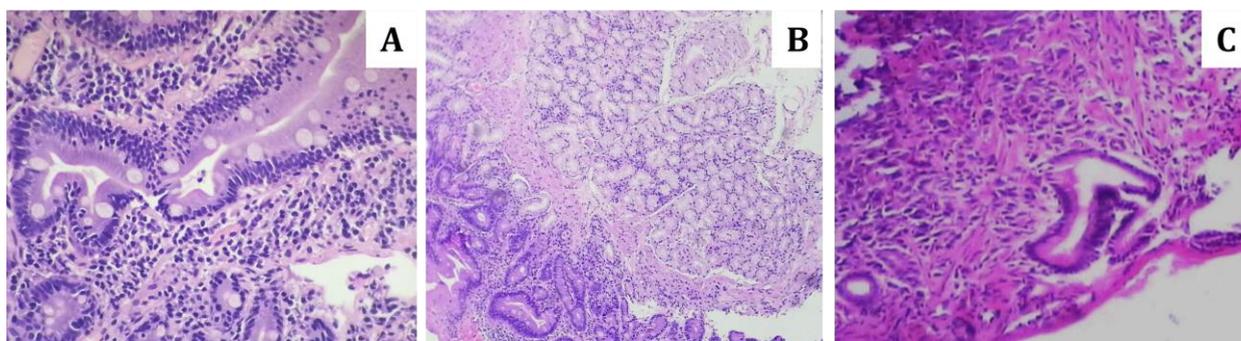


Fig. 4: **A:** Chronic nodular duodenitis showing intense chronic inflammatory infiltrate in the lamina propria. (H & E, 40x); **B:** Brunner gland hyperplasia showing brunner glands arranged in lobules separated by fibrous septae. (H & E, 10x) **C:** Adenocarcinoma duodenum showing groups and singly scattered pleomorphic cells (H & E, 40x)

Esophageal Biopsies

Among the esophageal lesions, 61.1% were non neoplastic and 38.9% were neoplastic.

These findings are in comparison with the findings of studies conducted by Krishnappa Rashmi et al¹² and Sandhya Panjeta et al¹³ which also showed that the non neoplastic lesions outnumbered the neoplastic lesions. This finding is in contrast with the findings in the study conducted by Bukhari U et al¹⁶ which showed a high incidence of neoplastic lesions when compared to the non neoplastic lesions. This may be attributed to the geographical variation. 5 (71.4%) out of 7 neoplastic lesions of esophagus, were Squamous cell carcinoma constituting the majority of the neoplasms. This observation was confirmed by Krishnappa R et al,¹² Bukhari U et al¹⁶ and Khan N A et al⁴ in their studies.

In the present study, most of the patients of esophageal cancer were seen in the 6th and 7th decades. This observation is compatible with those in the studies conducted by Krishnappa R et al,¹² Khan N A et al,⁴ Panjeta S et al.¹³ Neoplastic lesions of esophagus showed a male preponderance with the Male: Female ratio of 2.5:1. This observation was confirmed by Krishnappa R et al¹² and others in their studies. In the present study, the most common site of esophageal neoplasm is middle 1/3rd. 4 out of 7 esophageal neoplasms i.e., 57.1% were from the middle 1/3rd. This finding was confirmed by Katiyar et al¹⁵ and Krishnappa R et al¹² in their studies which also showed that the middle 1/3rd was the commonest subsite. The remaining 3 lesions (42.9%) were from the lower 1/3rd. None of them were located in the upper 1/3rd of esophagus.

Stomach Biopsies

12 Out of 25 (48%) non neoplastic lesions were diagnosed to be chronic gastritis. 5 of them (20%) were hyperplastic/inflammatory polyps, 3 (12%) were gastric ulcers, 2 (8%) indefinite for dysplasia, 2 (8%) intestinal metaplasia and 1(4%) was a hamartomatous polyp. The studies conducted by Thapa R et al,⁸ Sheik BA et al¹¹ and Krishnappa R et al¹² also showed a higher number of non neoplastic lesions.

The Commonest endoscopic presentation of gastric neoplasms in our study is ulcerative growth i.e., 5 out 10 (50%) followed by ulcero proliferative growth. of the

neoplasms presented as ulcerative growths endoscopically, 3 of them (30%) presented as polypoidal growths and 2(20%) as infiltrative lesions. Pailoor K et al⁹ in their study confirmed that 55.17% of neoplasms showed ulcerative growth, 34.48% showed ulceroproliferative growth and only 6.9% showed proliferative growth whereas Krishnappa et al¹² in their study observed 37% of gastric neoplasms to be ulcerative, 32% ulceroproliferative and 21% to be proliferative growths endoscopically.

18 out of 35 (51.4%) of the stomach lesions were located in the antrum or pylorus regions. This was followed by body of the stomach where 13 lesions (37.2%) were located and fundus where 4 lesions (11.4%) were located. This finding is compatible with those in studies conducted by Mimir P et al,¹⁷ Sheik BA et al¹¹ and Thapa R et al.⁸

5 out of 10 gastric carcinomas i.e., 50% were seen in patients of age group 51 – 60 years. 3 (30%) were seen in the age groups 61 – 70 years. This observation is in comparison with the other studies.

Present study showed male preponderance of stomach neoplasms with the Male: Female ratio of 1.5:1. This finding is compatible with the findings in the studies conducted by Thapa R et al,⁸ Pailoor K et al⁹ and Krishnappa R et al¹² which also showed a male preponderance in the stomach neoplasms.

Duodenal Biopsies

Non neoplastic lesions are more common than neoplastic lesions in duodenum. This observation is in comparison with the findings in the studies conducted by Sheik BA et al¹¹ and Krishnappa R et al.¹² Chronic nodular duodenitis was the predominant finding among the non-neoplastic lesions. 4 out of 5 neoplastic lesions were adenocarcinoma (80%) which constituted the majority of duodenal neoplastic lesions. The other neoplastic lesion was neuro endocrine tumor / carcinoid accounting to 20%. This finding was confirmed by Sheik BA et al¹¹ in their study which also showed that adenocarcinoma is the commonest neoplastic lesion of duodenum.

H.pylori Association

Table 6: Comparison of H.Pylori association in endoscopic biopsy.

Study	Percentage
Hemalatha et al ¹⁸ 2013 (n=400)	37.5%
Venugopal et al ¹⁹ 2013(n=111)	27.7%
Present study (n=70)	40%

In the present study, a total of 25 biopsies were stained with Giemsa stain for detection of H.pylori. 12 out of these 25 biopsies (48%) were chronic gastritis, 9 (36%) were adenocarcinoma of stomach, 3(12%) were gastric ulcer and 1 (4%) was duodenal ulcer. Out of 12 chronic gastritis lesions, 7 biopsies were stained negative and 5 showed positive staining for H.pylori. Out of 9 adenocarcinomas of stomach, 7 stained negative and 2 showed positive staining for H.pylori. 1 out of 3 gastric ulcers stained negative and the other 2 showed a positive staining. 1 duodenal ulcer showed positive staining for H.pylori. Thus, a total of 10 out of 25 biopsies (40%) stained for H.pylori showed a positive staining result and the remaining 15 (60%) showed a negative staining result.

Conclusion

In the present study we observed that the most common site of endoscopic biopsies is stomach (50%). Males in the 5th and 6th decades are commonly affected by the upper gastrointestinal lesions. Chronic gastritis is the most frequent endoscopic finding among the gastric non neoplastic lesions which presented as erythemic patch endoscopically and tubular adenocarcinoma is the commonest gastric neoplastic lesion which frequently presented as an ulcerative growth endoscopically. Most common neoplastic lesion of oesophagus is squamous cell carcinoma which presented usually as a growth endoscopically and among the duodenal lesions the commonest is chronic duodenitis that presented on endoscopy as multiple nodules. H.pylori negative gastritis is more common than H.Pylori positive gastritis. Thus we conclude that the upper GI endoscopy helps in early detection of mucosal lesions, diagnosis of the carcinoma at early stage and confirmation of clinically suspected cases leading to early clinical management.

Conflict of Interest: None.

Source of Funding: None.

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How to cite this article: Jonnalagadda K, Karre S, Thungaturthi SR, Gorrela VDPK. Histopathological spectrum of upper gastrointestinal endoscopic biopsies. *Indian J Pathol Oncol* 2019;6(3):422-7.