Indian Journal of Forensic Medicine and Pathology
Volume 15, Number 2, April-June 2022.
doi: https://dx.doi.org/10.21088/ijfmp.0974.3383.15222.7

ORIGINAL ARTICLE

Histopathological Spectrum of Upper Gastrointestinal Tract Endoscopic Biopsies

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ABSTRACT

Introduction:

Upper GI diseases (lesions) are frequently seen in clinical practice. These are associated with mortality and morbidity in patients with GI lesions. Early diagnosis of inflammatory disorders, infectious diseases, physical, mechanical and toxic reactions and neoplasms of upper gastrointestinal tract is possible with endoscopic biopsies with its histopathological correlation.

Materials and methods: This prospective study was carried out on 162 patients in Dr. D.Y. Patil Medical college, Hospital and research centre, Pune for a period of 2 years from June 2019-2021. Biopsy specimens were fixed in 10% formalin and routinely processed in Haematoxylin & Eosin stain. Results: A total of 250 biopsy samples were obtained from 162 patients of which 188(75%) were from Stomach, 33 (13%) from Duodenum, 25(10%) from Esophagus and 2% from gastro esophageal junction. Maximum biopsies were carried out in the age group of 31-40 years. 149 (64.19%) of biopsies were from males and 101 (35.8%) were from females. Among the total cases, 140 (86.41%) were non neoplastic lesions whereas 22 (13.58%) were neoplastic lesions. Epigastric pain seen in 71 (43.8%) was the commonest symptom ofupper gastrointestinal lesions.

Conclusion: The upper GI endoscopy helps in early detection of several mucosal lesions, diagnosis of malignancies at early stages and of clinically suspected lesions leading to prompt treatment.

KEYWORDS | Upper Gastrointestinal tract lesions; Endoscopic biopsy; Histopathological examination; Squamous cell carcinoma; Adenocarcinoma.

Author's Credentials:

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Received on: *28.03.2022*

Accepted on: *25.04.2022*

How to cite this article:
Tushar Kambale, Sanjay Gaiwale, Rumaanah Khan, et al./ Histopathological Spectrum of Upper Gastrointestinal Tract Endoscopic Biopsies.Indian J Forensic Med Pathol.2022;15(2):111-119.

INTRODUCTION

Upper Gastrointestinal diseases (lesions) are frequently encountered in clinical practice and are associated with high morbidity and mortality in patients with gastrointestinal lesions. Ability to assess the gastrointestinal tract with the help of an endoscope has increased the accuracy and early his to logic determination of mucosal lesions.[1] It helps in generating biopsies from the sites that were previously inaccessible, without

the major surgeries. Several pathological lesions like inflammatory disorders, infectious diseases; physical, mechanical and toxic reactions and neoplasms can affect the upper gastrointestinal tract.[2] Endoscopic mucosal biopsies are regarded as effective modality of investigation as well as treatment for most patients with upper GI symptoms.[1] Early clinical diagnosis of the above mentioned lesions is possible with endoscopic biopsies along with its histopathological diagnosis. Now, Endoscopy has be comeincomplete without biopsy for histopathological examination.[3] It is thus considered as an excellent diagnostic tool in diagnosing various upper GI pathologies.[1-4]

The present study determines the spectrum of Histopathological lesions of up pergastrointestinaltract encountered at tertiary care hospital in urban industrial area and to determine endoscopic biopsiesasan effective tool in the diagnosis and treatment of various upper gastrointestinal lesions.

MATERIALS AND METHODS

This Prospective study was conducted in the Department of Pathology, Dr. D.Y. Patil medical college, hospital & Research centre, Pune from June 2019-2021 (2 years). Endoscopic procedures were performed by gastroenterologist and biopsies were obtained from esophagus, stomach till the second part of duodenum. A total of 250 upper gastrointestinal tract endoscopic biopsies from 162 patients were evaluated with complete personal details, history, clinical examination and endoscopic findings.

Inclusion Criteria: All the endoscopic biopsies of esophagus, stomach till the second part of duodenum.

Exclusion Criteria: 1. All the lesions of mouth and pharynx. 2. All the duodenal biopsies beyond 2nd part of Duodenum.

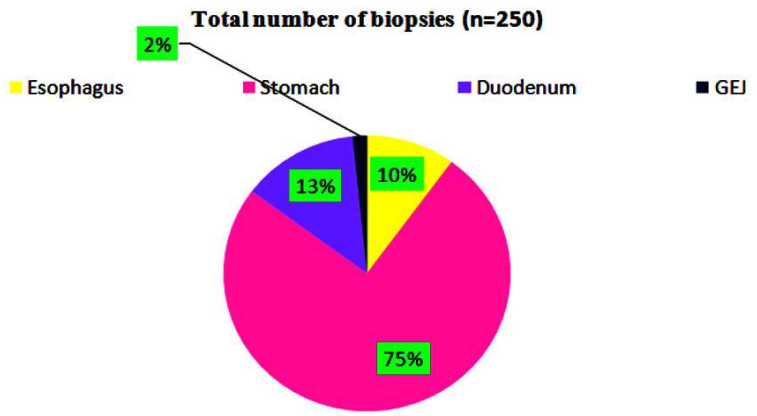
RESULTS

All the biopsy samples were fixed in 10% formalin, followed by conventional tissue processing and embedding. 4 micron thick sections were cut and slides were prepared. Serial sections were stained with haematoxylin and eosin and examined. Additional sections were stained with Giemsa stain to observe H. Pylori. IHC was performed wherever required. Lesions were classified according to Histopathological examination and WHO grading & other classifications were applied whenever necessary.

Written informed consent was obtained from all the patients. This study with Ref. No. I.E.S.C./285/2019 was approved by the Institutional Ethics Sub-Committee.

In this present study, atotal of 250 biopsies were obtained from162 patients, out of which 74 patients had as inglebiopsy sample and 88 patients had more than one biopsy sample. 188 (75%) biopsies were from stomach, followed by 33(13%) biopsies from duodenum, 25(10%) biopsies from esophagus and 4(2%). biopsies from Gastro esophageal Junction (Chart no 1).

Chart 1: Site wise distribution of upper GI endoscopic biopsies:(n=250).



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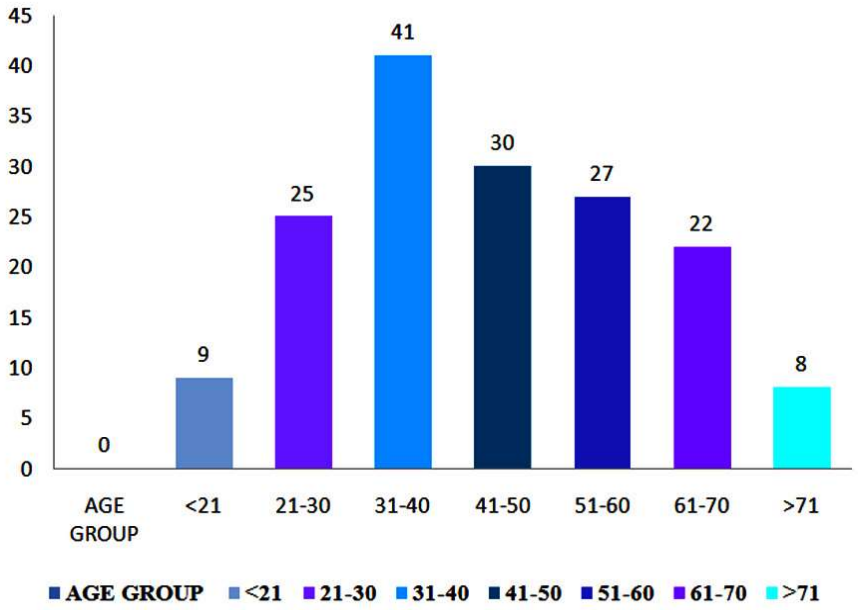
Among 162 patients, 41(25.3%)patients were in the age group of 31 - 40 years followed by 30 (18.51%) patients in the age group 41 - 50 years. Age group of <21 years had 9 (5.55%) patients, whereas age group >71 years had 8(4.93%) patients making them the least common age groups (Chart no 2).

Chart 2: Distribution of upper GI endoscopic biopsy according to Age (n=162).



Of the total 250 biopsies, 149 (60%) were from males and 101 (40%) from female patients showing a higher male preponderance. Male: Female ratio is 1.79:1 (Table no 1).

Table 1: Distribution of upper giendosc copicbiopsy according to Gender (N=162)

Gender	Number	Percentage %
Males	104	64.19
Females	58	35.8
Total	162	100

Epigastric pain was the commonest presentation in 71 (43.8%) patients. Nausea was the next common presentation seen in 43 (26.5%). Weakness was the least common symptom seen in 10 (6.17%) patients (Table no 2).

Table 2: Chief Complaints of Patients with Upper Gi Lesions (N=162)

Mainbiopsysite	Chief Complaints				
	Nausea	Epigastricpain	Weakness	Looses tools	Loss of weight
Esopahgus	6	8	0	0	11
GEJ	1	1	0	0	2
Stomach	36	54	0	1	9
Duodenum	0	8	10	13	2
Total	43 (26.5) %	71(43.8%)	10 (6.172%)	14(8.6)%	24(14.81%)

In our study, there were 140 (86.41%) non neoplastic lesions and 22 (13.58%) neoplastic lesions. Of the 140 non neoplastic cases, 89 (63.57%) caseswere from males and 51 (36.42%) cases were from females. Of the total 22 neoplastic cases, 15 (68.18%) cases were from Males and 7 (31.81%) cases were from females (Table no 3). Among 22 neoplastic cases, 14 (63.63%) patients had a mixed diet and 8 (36.36%) patients were vegetarians.

Table 3: Distribution of Type of Lesion According Togender (N=162)

Gender (n=162)	Type of Lesion		Total(n)
	Non Neoplastic	Neoplastic	
Males	89(63.57%)	15(68.18%)	104
Females	51(36.42%)	7(31.81%)	58
Total	140(86.41%)	22(13.58%)	162

Esophageal biopsies

Of total 25 esophageal biopsies, 15(60%) were from males and 10 (40%) were from females. 15 (60%) cases were non neoplastic and 10 (40%) cases were neoplastic. 9 (36%) cases showed squamous cell carcinoma, Chronic nonspecific esophagitis was seen in 8 (32%) cases (Table no 4). All esophageal carcinomas were observed in patients above 61 years of age. The most common endoscopic presentation was mucosal erythema seen in 14 (56%) cases that showed features of GERD/ Esophagitis on histological examination. Congestion of mucosa was seen in one case of Barrett's esophagus. All cases of carcinoma showed an ulceroproliferative growth on endoscopy (Table no 4)

9 cases of Squamous cell carcinoma were found in the middle 1/3rd esophagus and 1 case of Aden carcinoma was seen in the lower 1/3rd of esophagus.

Table 4: Histopathological and Endoscopicfindings of Esophagus: (n=25)

Histopathological findings	Endoscopic findings			Total no. of cases
	Mucosal erythema	Congestion of mucosa	Ulceroproliferative growth	
Barrett's Esophagus	0	1	0	1 (4%)
Reflux Esophagitis	6	0	0	6 (24%)
Chronic nonspecific Esophagitis	8	0	0	8 (32%)
Squamous cell carcinoma	0	0	9	9 (4%)
Adenocarcinoma	0	0	1	1 (4%)
Total	14	1	10	25

Gastric biopsies

Of the total 100 gastric cases, 64 (64%) were from males and 36 (36%) from female patients. Among these, 91 (91%) cases were non neoplastic and 9 (9%) cases were neoplastic. Of the total 91 non neoplastic cases, 89 (89%) cases showed chronic gastritis followed by 1 (1%) caseeach of peptic ulcer and hyperplastic polyp. Among the 9 neoplastic lesions, 8 (88.88%) cases of Adenocarcinoma and 1 (11.11%) case was signet ring cell Adenocarcinoma were reported on Histopathological examination (Table no 5). In the present study, gastric carcinomas were observed in 5 (56%) male and 4 (44%) female patients.

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Table 5: Histopathological and Endoscopicfinding of Stomach (n=100)

Histopathological findings	Endoscopic findings					Total
	Mucosal erythema/Erosion	Ulceroproliferative growth	Polypoidal mass	Ulcerative growth	Proliferative growth	
Chronic Gastritis	89	0	0	0	0	89
Adenocarcinoma moderately differentiated	0	1	0	1	0	2
Adenocarcinoma well differentiated	0	2	2	1	1	6
Signet ring Adenocarcinoma	0	1	0	0	0	1
Peptic ulcer	1	0	0	0	0	1
Hyperplastic polyp	0	0	1	0	0	1
Total	90	4	3	2	1	100

Out of a total 89 cases of chronic gastritis, 55 (61.7%) cases were chronic nonspecific gastritis followed by 17 (19.1%) cases of Chronic H.Pylori gastritis. Among these, 63 (40.38%) biopsies were from antrum and 60 (38.4%) biopsies were obtained from body of stomach (Table no 6). Mucosal erythema/erosion was the most common endoscopic diagnosis in our study seen in 89 (89%) cases of chronic gastritis. A polypoidal mass was seen in 1(1%) case of hyperplastic polyp. Adenocarcinoma showed ulcerative, ulceroproliferative or a polypoidal growth on endoscopy (Table No 5). 7 (78%) malignant cases were from Antrum and 2 (22%) from pylorus.

Table 6: Incidence and Distribution of Gastritis According to Biopsy Sites (n=89)

Histopathological diagnosis	Biopsy sites				Total no. of biopsies
	Fundus	Body	Antrum	Pylorus	
Chronic Gastritis with H.Pylori positive (9)	1	1	8	8	18
Chronic atrophic gastritis (7)	0	5	7	2	14
Chronic nonspecific gastritis (55)	12	45	33	0	90
Chronic superficial gastritis (17)	2	8	14	8	32
Eosinophilic gastritis (1)	0	1	1	0	2
Total cases : 89	15	60	63	18	156

Duodenal lesions

Of a total 33 duodenal biopsies, 22 (66.66%) were from males and 11 (33.33%) were from females. 31 (93.9%) cases were non neoplastic and 2 (6.06%) were neoplastic. 23 (69.69%) cases of Chronic duodenitis contributed to be the commonest non neoplastic lesion in the study followed by 7 (21.12%) cases of Celiac disease cases and 1 (3.03%) case of Brunner Gland hamartoma. Among the neoplastic lesions, 1 (3.03%) case each of Duodenal adenocarcinoma and Neuroendocrine carcinoma were reported (table no 7). Mucosal erythema or mucosal ulceration was the commonest endoscopic finding seen in 23 (69.6%) cases followed by Scalloping of folds seen in all 7 (21.21%) celiac disease cases. Polypoidal growth was present in a case that was diagnosed as Adenocarcinoma whereas, multiple nodules were seen in neuroendocrine carcinoma endoscopically (Table no 7).

Table 7: Histopathological and Endoscopicfindings of Duodenum(n=33)

Histopathological findings	Endoscopic findings				Total
	Mucosal erythema / ulceration	Scalloped Duodenal fold	Polypoidal growth	Multiple nodules	
Chronic duodenitis	23	0	0	0	23
Celiac disease	0	7	0	0	7
Brunner gland hamartoma	0	0	1	0	1
Adenocarcinoma	0	0	1	0	1
Neuroendocrine carcinoma	0	0	0	1	1
Total	23	7	2	1	33

Among the 4 biopsies taken from GEJ, 3 (75%) cases of Barrett's esophagusand 1 (25%) case of Adenocarcinoma were seen. Most common endoscopic finding of congestive mucosa was noted in all 3 (75%) cases of Barrett's Esophagus and ulceroproliferative growth was seen in 1 (25%) case of Adenocarcinoma.

DISCUSSION

Several lesions can affect the upper gastrointestinal tract including congenital anomalies, infections, inflammation, polyps, benign and malignant neoplasms. Before the emergence of endoscope, direct access to the lesions of gastrointestinal tract was difficult which resulted in inadequate diagnosis and management. As stated by National cancer registry the incidence of gastric and esophageal carcinomas are gradually increasing and have poor prognosis in late stages according to Globocan.[5,6] Endoscopy directly visualizes the lesions and more biopsies can be obtained from suspected areas to detect the lesions earlier for the diagnosis and definitive management.[7,8]

The present study comprising of 250 biopsies from 162 patients had 75% (188) biopsies from stomach, 13% (33) from duodenum, 10% (25) from esophagus and 2% (4) from Gastroesophageal junction (Chart no 1). In our study, maximum numbers of biopsies were from stomach, followed by duodenum, Esophagus and Gastroesophageal junction. The present study is comparable to a study conducted by Sharma A et al where out of a total 200 upper GI endoscopic biopsies, 130 (65%) biopsies were from stomach, 44 (22%) from duodenum and 26 (13%) biopsies were from esophagus.[9] Our findings were also similar to a study done by Margaret TJ et al wherein out of 152 Upper GI biopsies 113 (74%) biopsies from stomach, 22 (15%) from esophagus and 17 (11%) from Duodenum.[10] This result can also be compared to a study carried out by Mohan B wherein out of a total 106 biopsies, 60% were from stomach, 22% from esophagus ans 17% from duodenum.[11]

The present study showed 41 (25.3%) patients of upper GI endoscopic biopsies in a age group 31-40 years followed by 30 (18.51%) patients in the age group 41-50 years. The lowest incidence was observed in age groups >71 years and<21 years which had 8 (4.93%) and 9 (5.5%) patients respectively (Chart no 2). In the present study, maximum patients were seen in 3rd to 5th decade. Our result was similar to a study conducted by Margaret TJ et al, wherein the commonest age group for upper GI endoscopic biopsy was 31-40 years.[10] Our result was also comparable to a study done by Hirachand et al wherein the maximum patients were in the age group 41-50 years. Differences in the age group dominance can be explained due to geographical, cultural and ethnical diversity.[12]

Out of 162 patients, 104 (64.19%) were males and 58 (35.8%) were females with a male female ratio of1.79:1 (Table no 1). Our findings are similar to other studies carried out by Hirachand et al where the male female ratio was 1.76:1[12] Our result was almost similar to another study done by Sheikh et al wherein the ratio observed was 1.92:1.[13] Similarly JC Paymaster et al had a ratio of 2.8:1.[14] The female genderis less preponderant and could

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be observed because of social obligations as compared to males who have ahigherexposure to risk factors.

In our study of 162 patients, Epigastric pain was the commonest chief complaint seen 71 (43.8%) patients followed by nausea seen in 43 (26.5%) patients and weakness seen in 10 (6.17%) patients (Table no 2). Similar results were seen in a study done by Patel KS et al that had 53(53%) patients with epigastric pain and 18(18%) patients with nausea as their chief presenting complaint.[15] Our findings were almost similar to a study done by Ainapure et al where out of a total 322 patients, 160 (49.68%) patients presented with epigastricpain.[16]

Our study had 140 (86.41%) non neoplastic lesions and 22 (13.58%) neoplastic lesions (Table no 1). More number of non-neoplastic lesions were present in our study. Our finding was almost similar to the study done by Margaret TJ et al where the non-neoplasticlesions were137 (90.13%) and neoplasticlesions were 15 (9.87%).[10] another study done by Rani et al reported 54% of non-neoplastic and 40% neoplastic lesions.[17] In contrast to our study, Mohan B et al reported more number of neoplastic than non-neoplastic lesions.[11] These differences in the result may be due to genetic, environmental, personal and nutritional factors in an individual.

Histopathological Spectrum of Esophageallesions: Out of total 25 cases, 15 (60%) cases were non-neoplastic and 10 (40%) were neoplastic lesions. (Table no 2) Chronic nonspecific Esophagitisseen in 8 (32%) patients was the commonestnon - neoplasticlesion which was similar to another study done by Kothari et al where there were 12 (24%) cases of chronic nonspecific esophagitis.[18] Out of the 10 neoplastic lesions in our study, all 9 (36%) cases of squamous cell carcinoma were present in the middle one third esophagus and was the commonest malignancy. 1 (4%) case of Adenocarcinoma was present in the lower 1/3rd of esophagus. This finding was consistent withotherstudiesd one by Ganga et al and Mohan B et al wherein middle 1/3rd was the commonest site for esophageal malignancy.[11,19] All cases of esophageal malignancies were found to be in theolder age group (>61 years). A study conducted by Malkan G et al reported ahigherincidence of esophageal carcinomain the6th decadein India.[20] Maximum number of esophagealcarcinoma patients had a mixed diet. A similar finding was reported in another study done by Samasaram I et al where squamous cellcarcinoma was seen in patients whose diet is low in fruits and vegetables.[21] The most common endoscopic presentation was mucosal erythema seen in 14 (56%) cases followed by 10 (40%) cases showing ulceroproliferative growth. (Table no 4) In the present study, all 10 (100%) carcinoma cases presented as growth on endoscopy. Our finding was comparable with another study done by Rani D et al wherein, out of a total 30 cases, 25(83.3%) cases of carcinoma presented with growth on endoscopy.[17] Our result is also comparable to a study done by Karre S et al wherein 39% cases had mucosal erythema and 61.1% cases had growth on endoscopy.[22]

Histopathological spectrum of Gastriclesions: In this study, of a total 100 cases, 90 (90%) are non-neoplastic cases and 10 (10%) are neoplastic. This result was comparable with the other studies done by Margaret TJ et al wherein out of a total 113 gastric cases, 104 (92%) were non-neoplastic 9 (8%) cases were neoplastic.[10] Our finding was also comparableto a study conducted by Karre S et al where 71.4% were non-neoplastic lesions and 28.6% were neoplastic[22] Chronic gastritis was the commonest lesion accounting for 89 (89%) cases (Table no 5). Most of the patients with chronic gastritis belonged to age group 31-40 followed by 41-50 years and were mostly male patients. Chronic smoking and alcoholusecauseslow pyloric pressure in the adult population it may lead to bile reflux and damage the gastric mucosal barrier.[15] Our study reported 9 (10.11%) cases of Chronic H Pylori gastritis which was almost comparable to a study done by Kothari et al who reported 6(12%) chronic H. Pylori gastritis cases.[18] Our finding was also comparable to a study conducted by Rashmi et al who reported 3 (7%) cases of Chronic H. Pylori Gastritis.[4] The low incidence of H. Pylori gastritis could be due to availability of new ergeneration of

antibiotics and improved non invasive tests for detection of H. Pylori. Out of a total 9 gastric carcinoma cases, 7 (78%) cases were from Antrum whereas 2 (22%) cases were from pylorus. This was similar to studies conducted by Rashmi et al who reported 8 (43%) cases in pylorus.[4] The antrum is the commonest site of gastric carcinoma as most atrophic gastritis occurs in this region. Over the years, there is development of a condition known as achlorhydria which could lead to reduction and nitrates and formation of carcinogenic N-Nitro so compounds which could be one the factors causing gastric carcinoma.[23] In our study, 90 (90%) cases had mucosal erythema as their endoscopy finding which included 89 (89%) cases of gastrit is and 1 (1%) case of pepticulcer. This was inconsensus withot her studiesd one by Memon et al where 80.6% gastric cases showedmucosalery the maduringen do scopicexamination.[2]

Histopathological spectrum of Duodenallesions: In duodenum, 31 (93.93%) cases were non neoplastic whereas 2 (6.06%) cases were neoplastic cases (Table no 7). A study conducted by Suvarna S et al had 20 (80%) non neoplastic cases and 5 (20%) neoplastic cases.[24] Our result is also similar to a study done by Mohan B et al wherein 89% were non-neoplastic and 11% were neoplastic lesions.[11] There was 1 (3.03%) case of Adenocarcinoma in the current study, which was almost similar to a study by Ganga et al where there were 2 (5.88%) cases of Adenocarcinoma.[19] The incidence of duodenal malignancy is higher in older age groupbecause of late diagnosis of the condition due to nonspecific symptoms and symptoms resembling closely to that of aduodenal ulcer.[25] 1 (3.03%) Neuro endocrine tumor was reported in our study and was similar to another study conducted by Kothari et al who also reported a 1(1%) case of neuro endo crinecarcinoma.[18] All 7(100%) cases of celiac disease had scalloping of mucosa on endoscopic examination (Table no 7) which was similar to another study done by Rani et al wherein 12 (85.7%) cases of celiac disease had Scalloping present.[17] Endoscopically, multiple nodules were seen in neuroendocrine carcinoma (Table no 7) which was similarly observed in another study carried out by Karre S et al.[22]

CONCLUSION

In the present study, there were 4(2%) cases from GEJ (Chart no 1). This finding was similartoa study done by Gangaetal who had a total of 5(3%) GEJ cases.[19]

Regarding concordance with endoscopic diagnoses, in our study 95.67% of histologically confirmed cases were clinically/ endoscopically diagnosed or suspected by the clinician.

Conflict of Interest: No potential conflicts of interest to disclose.

In our present study we observed morenonneo plastic than neoplastic cases with higher incidence of non-neoplastic lesions inpatients less than 50 years of age. Stomach was the commonest site of endoscopic biopsies. Chronic gastritis was the most common non neoplastic lesion of stomach which presented as mucosal erythema on endoscopy. Squamous cell carcinoma was the commonest esophageal lesion having ulceroproliferative growth on endoscopy. In contrast to this, neoplastic lesions were seen in the olderage group.

Hence we conclude that the upper GI endoscopyhelps in early detection of several mucosal lesions, diagnosis of malignancies at early stages and of clinically suspected lesions leading to prompt treatment.

Conflict of Interest:
The author has made no acknowledgment in this article.
Ethical Clearance
Taken from VIMS, Bellary
Source of Funding:
The author declares that this is a self-funded research project.

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