



“Study of Endoscopic and Histopathologic correlation in Upper Gastrointestinal lesions in a Tertiary Care Hospital”

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Introduction:

The upper gastrointestinal tract starts from buccal cavity and continues uptill the duodenum where the suspensory muscle demarcates between upper and lower gastrointestinal tract. Diseases of the upper gastrointestinal tract includes neoplastic and non neoplastic lesions. Upper gastrointestinal tract is a common site for neoplastic lesions, especially malignant tumors. Gastric cancer, is the fourth-most-common type of cancer and the second highest cause of death due to cancer globally.

Aims & Objectives:

1. To determine the spectrum of histopathological lesions both non-neoplastic and neoplastic lesions in patients undergoing upper gastrointestinal biopsy and correlate them with clinical presentation, age and sex.
2. To establish endoscopic biopsies as an effective tool in proper diagnosis and management of various lesions.

Methodology:

This was one year observational study carried out between January 2019 to January 2020 in Dhiraj Hospital.

Results:

In our study, 166 cases of endoscopic biopsies were studied. Peak incidence was seen in the age group of 45-65 years, with higher male predominance. Dysphagia was the most common presenting symptom. Stomach was the most common site with 46 % of incidence. Gastritis was most common type of lesion

followed by adenocarcinoma. Second most common site was duodenum (29%), with duodenitis being the common presentation.

Conclusions:

Endoscopic biopsy permits exact diagnosis along with providing opportunity to see the lesion status and helps in deciding specific therapy. Histopathological study helps to detect mucosal lesions at an early stage like atrophy, intestinal metaplasia and dysplasia to prevent its progression into invasive cancers.

KEY WORDS:

Esophagogastroduodenoscopy, Gastric Ucler, Helicobacter Pylori, Polyp, Scalloping.

Introduction

Human gastrointestinal tract is long and tortuous. It is a common site for lesions like congenital, inflammatory and neoplastic conditions.^{1,2,3} An endoscope helps us to see the regions that our hands cannot reach and see the world your eyes cannot see.⁴ Upper GI endoscopy utilizes a lighted, flexible, fibre-optic or video endoscope for visual examination of the upper gastrointestinal tract.⁵ When Esophagogastroduodenoscopy is performed to evaluate a specific symptom and if an etiological structural lesion is observed, biopsy is taken from the lesion.⁶ It allows direct vision of the lesion for taking biopsy which arises an opportunity for improved correlation of histologic features with gross features of the disease in both early and advanced phases.^{7,8,9}

Qualified pathologist examine the specimens obtained by endoscopy as a regular & dire part of handling patients with ailments of the alimentary tract.¹⁰ Gastroenterologists rely on the results of the biopsy for correct diagnosis.³ Therefore histopathological study is an essential complement to endoscopic examination for GI lesions.³ It has been aptly described that we may now be merely scratching the surface of what lies ahead in the marriage of microscopy and endoscopy.¹¹ There are not many studies showing correlation between endoscopy and histology. The endoscopic biopsies not only help in the diagnosis of the disease but also help in monitoring the course and determining the extent of a disease along with response to therapy and for the early detection of complications.^{12,13,14,15}

This study highlights correlation of endoscopic and histopathological diagnosis of neoplastic and non-neoplastic upper gastrointestinal lesions.

Material and method

The present study included gastric endoscopic biopsies received in the Histopathology Department, at Dhiraj Hospital. The study was an observational study and 166 patients were included in the study over a period of 1 year.

Inclusion Criteria:

- Patients presenting with ulcers, abnormal growths and precancerous conditions.

Exclusion Criteria:

- Inadequate biopsy in terms of absence of glands or presence of only fibrocollagenous tissue.
- Patients presenting with lesions in the oral cavity and pharynx.
- Patients presenting with lesions beyond the second part of duodenum (D2).

Brief clinical data was noted from the case records, which included relevant habits, if any, presenting symptoms and endoscopic findings after which presumptive clinical diagnosis was made. The endoscopic biopsy specimens obtained were put in saline, placed on the filter paper with mucosal surface facing upwards and 10% formalin was used for fixation. All the tissue bits were embedded together for ideal visualization. Then, sections measuring 4-6 microns were stained routinely with Haematoxylin and Eosin. Other special stains were done as and when required. The neoplastic lesions were diagnosed as per WHO classification of tumors. An attempt was made to diagnose the lesion on gross visualisation during endoscopy and to correlate them histopathologically.

Statistical Analysis

This was a descriptive study to correlate endoscopic appearances or diagnosis of upper GI lesions with the final histopathologic diagnosis. Hence the data collected was analyzed as percentage of concordance of the two. Frequency distribution of various parameters were performed. Data were plotted in tabulated form.

Result

16 biopsies were excluded out of 166 biopsies obtained, as they contained only fibro collagenous tissue, scanty material & non-specific findings. Among 49 (32.6%) neoplastic lesions, the most common was Squamous cell carcinoma of esophagus summing to 30 cases (20%) followed by 19 cases of adenocarcinoma of stomach (8.6%).(Table 1) The most common age group affected was 45-65 years for both squamous cell carcinoma & adenocarcinoma. (Table 2) The non-neoplastic lesions which included gastritis, duodenitis, villous atrophy, polyp and lymphangectasia were commonly seen in males accounting for 101 cases (67.3%).

TABLE 1: INCIDENCE OF DIFFERENT UPPER GASTROINTESTINAL LESION ACCORDING TO HISTOPATHOLOGY

Lesions	No. of Cases	Percentage
Esophagus		
1.Chronic Nonspecific Esophgitis	06	4%
5. Carcinoma	30	20%
Stomach		
1.Chronic gastritis	28	18.6%
2.H.Pylori infection	10	10%
3.Benign gastric ulcer	11	7.3%
4.Dysplasia	03	2%
5. Carcinoma	13	8.6%
6. Polypoidal lesion	05	3.3%
Duodenum		
1.Duodenitis	17	11.3%
2.Other Non –specific lesions	21	14%
3.Tumors	06	4%
Total	150	

TABLE 2: AGE & SEX WISE DISTRIBUTION OF UPPER GASTRO -INTESTINAL LESIONS

Age in years			21-30	31-40	41-50	51-60	61-70	71-80	81-90
Esophagus	Esophagitis	M	0	0	1	2	1	1	1
		F	0	0	0	0	0	0	0
	Esophageal Carcinoma	M	1	2	5	6	2	3	1
		F	2	0	1	2	3	1	1
Stomach	Gastritis	M	2	3	4	4	3	1	2
		F	2	1	1	2	1	1	1
	Gastric Malignancy	M	1	1	3	2	1	1	1
		F	0	0	1	1	0	0	1
	Others	M	3	1	2	4	3	2	2
		F	1	2	2	2	3	2	1
Duodenum	Duodenitis	M	1	2	2	1	2	1	2
		F	1	1	1	1	0	2	0
	Duodenal Malignancy	M	0	1	2	2	0	0	0
		F	0	0	0	1	0	0	0
	Others	M	2	2	4	3	1	1	1
		F	1	0	2	3	1	0	0

TABLE 3: CHIEF COMPLAINTS IN THE STUDIED PATIENTS

Chief complaints	Frequency	Percentage
Dyspepsia	18	12%
Dysphagia	58	38.6%
Epigastric Pain	25	16.6%
Hematemesis	07	4.6%
Loss of weight	20	13.3%

Recurrent vomiting	18	12%
Total	150	97.1%

Dysphagia is the most common complaint followed by epigastric pain and loss of weight.

TABLE 4: CORRELATION OF ENDOSCOPIC AND HISTOLOGICAL DIAGNOSIS IN ESOPHAGEAL BIOPSIES

Endoscopy	Histology			Percentage of concordance (%)
	Esophagitis	Squamous cell carcinoma	Total	
Erythema	4	01	05	80%
Growth	2	29	31	93.5%
Total	6	30	36	83.3%

Endoscopic and histological correlation of 36 esophageal biopsies shows that 1 out of 5 cases of esophagitis, was diagnosed as carcinoma upon endoscopy and remaining 4 were diagnosed as esophagitis in both, yielding 80% concordance. Similarly, out of 30 cases of carcinoma, 29 were malignant on both endoscopic and histological examination, whereas 1 case was documented as esophagitis on endoscopy, yielding to 93.5% concordance. (Table 4)

TABLE 5: CORRELATION OF ENDOSCOPIC AND HISTOLOGICAL DIAGNOSIS IN GASTRIC BIOPSIES

Endo-scopy	Histology							
	Gastritis	H.Pylori	Ulcer	Polyp	Dysplasi a	Carcinoma	Total	% of con- cordance
Erythema	28	03	01	00	00	00	32	87.5%
Erosion	00	07	10	00	00	01	18	94.4%
Polypoidal lesion	00	00	00	05	00	02	07	71.4%
Growth	00	00	00	00	03	10	13	76.9%
Total	28	10	11	05	03	13	70	-

Endoscopic and histological correlation of 70 gastric biopsies shows that the most common lesion on endoscopy was erythema which was diagnosed as gastritis on histopathological examination with a concordance of 87.5%. The concordance between endoscopy and histopathological diagnosis of ulcer was 94.4% and out of 13 histologically diagnosed gastric carcinoma cases, 10 presented with growth on endoscopy showing concordance of 76.9%. (Table 5)

TABLE 6: CORRELATION OF ENDOSCOPIC AND HISTOLOGICAL DIAGNOSIS IN DUODENAL BIOPSIES

	Histology						
Endoscopy	Duodenitis	Intra-epithelial lymphocytosis	Villous atrophy	Lymphangectasia	Carcinoma	Total	% of concordance
Erythema	15	00	00	00	00	15	100%
Scalloping with loss of folds	02	03	16	01	00	22	73%
Polypoidal lesion	00	00	00	01	00	01	100%
Growth	00	00	00	00	06	06	100%
Total	17	03	16	02	06	44	-

Endoscopic and histological correlation of 44 duodenal biopsies shows that the most common discordant lesion on endoscopy was scalloping with loss of folds whereas one case of lymphangectasia was diagnosed to be a polypoidal lesion upon endoscopy. Scalloping lesions accounted for 73% concordance between the two diagnostic methods. Duodenitis and carcinomas showed 100% concordance in our study. (Table 6)

TABLE 7: STATISTICAL ANALYSIS OF UPPER GASTROINTESTINAL LESIONS

Kappa Statistic (Correlation)	84%
Sensitivity	91.8%
Specificity	95.2%
Positive Predictive Value	90%
Negative Predictive Value	96.1%

Histopathological study has 95.2% specificity for diagnosis of gastrointestinal neoplasms and 91.8% of sensitivity for the same. 90% of the cases were diagnosed truly for having neoplastic lesion on endoscopy as well as histopathologically yielding a correlation of 84%. (Table 7)

Discussion

Gastric symptoms like dyspepsia, vomiting, abdominal pain, ulcers etc. are very common cause of discomfort amongst patients & are the common reasons for referral for endoscopic examination. The modern endoscope has evolved from a rigid hollow metal tube to a light, flexible fiberoptic system using self-illumination. It not only allows visual inspection of the GI tract, but also permits access to suspected tissue area with the aid of a biopsy needle.

Endoscopic 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. Expertisation on the part of endoscopist in choosing the appropriate site are therefore needed, along with proper processing of biopsy tissue and meticulous reporting by the histopathologist for interpretation of endoscopic biopsies.

Ultrasound can be performed with the help of an endoscope in selected cases whose biopsies are negative for malignancy but have suspicious findings on endoscopy and have atypical presentation like profound weight loss, advanced age, short duration of symptoms etc.^{16,17}

TABLE 8: COMPARATIVE INCIDENCE OF UPPER GASTROINTESTINAL MALIGNANCY BY ENDOSCOPY

Authors	Site			
	Esophagus	Stomach	Duodenum	Others
Lal et al ¹⁸	84%	12%	4%	-
Paymaster J C et al ¹⁹	66.5%	16.1%	-	17.4%
Devi KR et al ²⁰	54.3%	22.5%	-	23.2%
Prabhakar et al ²¹	44.9%	6.17%	-	48.93%
Sauerbruch et al ²²	46.4%	50.7%	2.9%	-
Present Study	61.2%	26.5%	4%	-

The percentage of esophageal carcinoma in the present study was 61.2% which was almost similar to Paymaster J C et al and lower than that of Lal et al. (Table 8).^{18,19,20,21,22} The percentage of gastric malignancy was 26.5% which was higher than other studies^{18,19,21,22} except that of Sauerbruch *et al*²² (Table 8). In our study, duodenal malignancies constituted 4% which was similar to other studies.

In the present study, the peak incidence of the esophagogastrroduodenal lesions was in the age group between 45-65 years. The mean age was of 55.5 years which almost simulates a study conducted by Behar *et al*²³ and Bogomeltz *et al*²⁴ The youngest patient was 27 years old and the oldest patient was 84 years old. It was almost similar to a study by Bogomeltz *et al*²⁴ and Lal *et al*¹⁸. Male to female ratio of esophagogastrroduodenal lesions in our study was 2.2:1. Kumar *et al*²⁵, Misra *et al*²⁶. And Paymaster *et al*¹⁹ had a similar observation in their studies. Whereas, contrast findings were observed by Devi *et al*.²⁰ Also the highest incidence of carcinoma was between 45-65 years which was almost similar to all the other studies. (Table 9)

TABLE 9: AGE RANGE OF CARCINOMAS IN VARIOUS STUDIES

Author(year)	Age in years
Vidyavathi K. ³¹	51-60
Khan MI et al ³²	24-82
Admad Mohd Afroz ³³	45-80
Present study	45-65

Of 150 patients with upper gastrointestinal tract endoscopic biopsies, 48 were females and 102 were males. The male to female ratio was 2.2:1, similar to study done by Shennak MM et al.²⁷. In the present study, sex distribution of squamous cell carcinoma esophagus correlates with the study Wang J et al.²⁸. (Table 10) And incidence of gender ratio of adenocarcinomas matches with that Leena Devi et al²⁹. (Table 11) 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 al¹⁹ or due to large number of male patients attending outpatient department of the hospital as compared to female patients.

TABLE 10: INCIDENCE OF SCC OF ESOPHAGUS WITH GENDERS

Author(year)	Total no. of patients	Male:Female
Sons HU & Borchard F ³⁰	171	1.6:1
Wang J et. Al. ²⁸	51	1.8:1
Ahmad mohd Afroz et al ³¹	34	3.4:1
Present study	30	2:1

Table 11 : INCIDENCE OF ADENOCARCINOMAS WITH GENDERS

Author(year)	Adenocarcinoma(M:F)
Leena Devi et al (1980) ²⁹	3.5:1
Durani et al (2009) ³²	1.4:1
Sujata Metan et al ³³	6:1
Present study	3.3:1

In the present study the most common complaints are dysphagia followed by epigastric pain and dyspepsia. Dysphagia is common symptom in patients of SCC, same was reported by Kumar MK(1973)³⁴, Gadour et al(2004)³⁵. Epigastric pain in patients of adenocarcinoma, followed by dysphagia, dyspepsia, recurrent vomiting. Similar symptoms were reported by Gadour et al(2004)³⁵, Sivagamani(1974)³⁶.

Out of 13 cases studied, 10 cases diagnosed endoscopically as gastric carcinoma correlated with those of histopathological diagnosis as Adenocarcinoma with concordance of 76.9% . Our study showed good correlation in the cases of carcinoma. Our study findings were similar to the studies conducted by Hecker et al, 21 Sharma S. et al.13. Our study is similar to the studies conducted by Pailoor K. et al, Qizibash AH et

al^{37,38} and incidence of carcinoma increased with increase in age similar to the study done by Sharma S et al³⁹.

Histopathological study also helps in detecting mucosal lesions like atrophy, intestinal metaplasia and dysplasia at an early stage so as to prevent progress of these lesions to invasive cancers. Endoscopic examination is incomplete without biopsy and histopathology which are considered as gold standard diagnostic procedure among patients suspected for carcinoma. The necessity for diagnostic laprotomy is eliminated with the advent of endoscopic biopsy and histopathological correlation.

CONCLUSION:

The conclusion of the study was that endoscopic examination alone might miss out in diagnosing majority of the lesions. So, histological examination in adjunct with endoscopy should be considered as much more valuable diagnostic tool rather than endoscopy alone.

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