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A Comprehensive Study of Histopathological Analysis in Upper Gastrointestinal Endoscopic Biopsies

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ABSTRACT

Background A variety of disorders affect the upper gastrointestinal tract. Endoscopy in combination with biopsy plays an important role in early diagnosis and management of these diseases. The aim of this study is to determine the spectrum of histopathological lesions of upper GI endoscopy and frequency of lesions in relation to age and gender.

Materials and Methods

A total of 232 endoscopic biopsy specimens from upper GI were studied retrospectively from January 2018 to December2022in the department of pathology, Viswabharathi medical college, Kurnool, AP.

Results

Esophagus was the most common biopsied site (51%), followed by stomach (46%) and duodenum (3%). In esophagus, majority were neoplastic (89%)of which squamous cell carcinoma (94%)was most common. Amongst gastric biopsies 79% are neoplastic lesions and adenocarcinoma being most common histological

type. Duodenal biopsies showed chronic non-specific duodenitis (62%), adenocarcinoma (38%).

Conclusion

In upper GI endoscopic biopsies, the most common site is esophagus and most common lesions are neoplastic. Predominantly males and persons of 6th decade were commonly biopsied. Upper GI endoscopy proves to be a reliable and fitting initial assessment for individuals experiencing upper GI symptoms. Histopathology stands as the gold standard for diagnosing lesions identified during endoscopic examination.

Keywords

Upper GI biopsies, endoscopic biopsies, UGI.

INTRODUCTION

The upper gastrointestinal (GI) pathology remains a subject of profound interest and clinical significance in modern gastroenterology. Within this domain, histopathological analysis of endoscopic biopsies emerges as a pivotal tool, unravelling the microscopic intricacies that underlie a spectrum of disorders affecting the esophagus, stomach, and duodenum.

This study aims to explore detailed findings from biopsies taken during upper gastrointestinal (GI) endoscopies. We will examine these histopathological findings to better understand and address various aspects of gastrointestinal diseases.

The goal is to provide a clear and straightforward explanation of the intricate details that influence how we comprehend and manage conditions affecting the digestive system. Endoscopy in combination with biopsy plays an important role in early diagnosis and management of these diseases. Accurate diagnosis and subsequent therapeutic interventions depend upon the precise characterization of these pathologies. The upper GI tract, encompassing the esophagus, stomach, and proximal duodenum, is susceptible to a variety of pathological conditions ranging from inflammatory to neoplastic.

This is a retrospective study conducted in the department of pathology, over a period of 5 years from January 2018 to December2022. A total of 232 endoscopic biopsy specimens from upper gastrointestinal tract were evaluated during this period.

Inclusion Criteria

- All endoscopic biopsies of upper GI tract.

Exclusion Criteria

- Lesions of the oral cavity and pharynx.
- Lesions below the second part of duodenum.

MATERIALS AND METHODS

These biopsies were received in properly labeled and tightly closed containers containing 10% formalin, which were then examined grossly for the number and appearance. Following sufficient fixation, the entire biopsy underwent standard processing and was embedded in paraffin, with the mucosal surface positioned upward. Sections, five microns thick, were then cut perpendicular to this surface utilizing a rotary microtome.2-3serial sections were prepared on each slide for each biopsy. Sections were stained with routine Hematoxyline and Eosin stain and mounted with cover slips using Distyrene Plasticizer Xylene.

ANALYSIS OF RESULTS

The study included 232 endoscopic biopsies from upper gastrointestinal tract. Site wise distribution of upper GI biopsies included 119 cases from esophagus (51%) and 105 cases from stomach (46%) and 8 cases from duodenum (3%).Among these 84% are neoplastic and 16% are non-neoplastic.

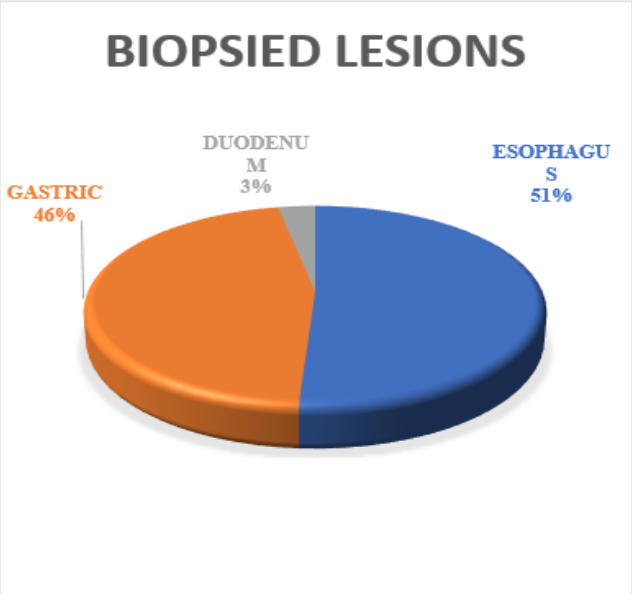

Fig. 1: Pie diagram shows anatomical distribution of upper GI lesions.

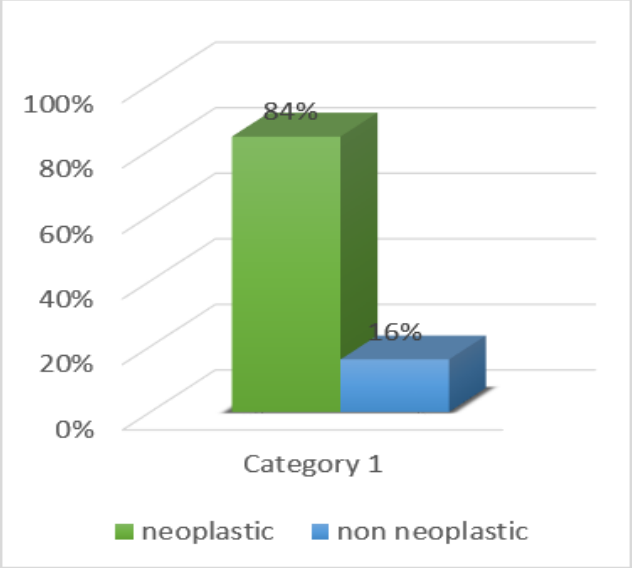

Fig. 2: Histogram shows neoplastic lesions vs non neoplastic lesions of Upper GI

The age of the patients varied from 28 to 77 years. The peak age incidence for gastric carcinomas preceded that of esophageal cancers by approximately a decade. The study also indicated a slight male predominance in overall upper gastrointestinal tract with 121(52%)male patients and 111(48%) female

patients. The male: female ratio was 1.1:1. The most common age group in neoplastic lesions was between 50- 70 years.

The most common presenting complaint for patients was dysphagia and weight loss esophageal carcinomas while patients with gastric carcinoma presented with dyspepsia and weight loss.

Esophagus: We received 119 cases of esophageal biopsies which account for 51% of total cases. There was slight female predominance (59.6%) in endoscopic esophageal biopsies. Majority of the biopsies were neoplastic (90%) of which squamous cell carcinoma (94%) was most common. Majority presented in the middle third of the esophagus (68%). In SCC of esophagus moderately differentiated SCC being the most commonly (68%). On endoscopy, the commonest type of presentation of SCC was polypoid growth (78%) followed by ulcerative (14%) and infiltrative (8%) lesions. Among the nonneoplastic lesions Barrett's esophagus (33%) was most common. Table 1 shows distribution of various non neoplastic lesions of esophagus in our study.

Table 1: Distribution of non-neoplastic lesions in oesophageal endoscopic biopsies

TYPE OF LESION	NO. OF CASES	PERCENTAGE
Barrets esophagus	4	33%
Acute esophagitis	2	17%
Chronic esophagitis	3	25%
Mild dysplasia	2	17%
Moderate dysplasia	1	8%
Total	12	100%

Stomach

We received 105 cases which constitute 46% of total cases of which neoplastic lesions account for84 cases (80%) and 21 non-neoplastic (20%). Most common type of neoplastic lesion being adenocarcinoma (88%). Table 2. shows distribution of neoplastic lesions in this study. There were 5 cases of poorly differentiated carcinomas of which 3 were signet ring cell type. In gastric biopsies the predominant no neoplastic lesion was chronic gastritis. Table 3. Shows various types of non-neoplastic gastric lesions encountered in our study. The commonest site of presentation of the gastric adenocarcinoma was the antrum, followed by the fundus and then the body.

Table 2: Histopathological patterns of neoplastic lesions in gastric biopsies

Neoplastic lesions	No. of cases	Percentage
Adenocarcinoma	74	88%
Squamous cell carcinoma	2	2%
Non-Hodgkin lymphoma	2	2%
Poorly differentiated carcinoma	5	5.8%
adenoma	1	1.2%
Total	84	100%

Table 3. Histological patterns of non-neoplastic lesions in gastric biopsies

Non neoplastic lesions	No. of cases	Percentage
Chronic gastritis	13	62%
Acute gastritis	2	9.5%
Active ulcer	1	4.7%
Active ulcer+ MALT	1	4.7%
Dysplasia	1	4.7%
Hyperplastic polyp	1	4.7%
Parietal cell hyperplasia	1	4.7%
Foveolar hyperplasia	1	4.7%
Total	21	100%

Duodenum

Out of total 8 duodenal biopsies, 5 (62%) were non neoplastic and 3 (38%) were neoplastic. Most common endoscopic presentation of duodenal lesions is multiple nodules (50%). All the non-neoplastic lesions showed chronic non-specific duodenitis, whereas all neoplastic lesions were adenocarcinomas. Of total 8 duodenal biopsies, peak incidence is in 6th decade. Male: Female ratio was 1.6:1.

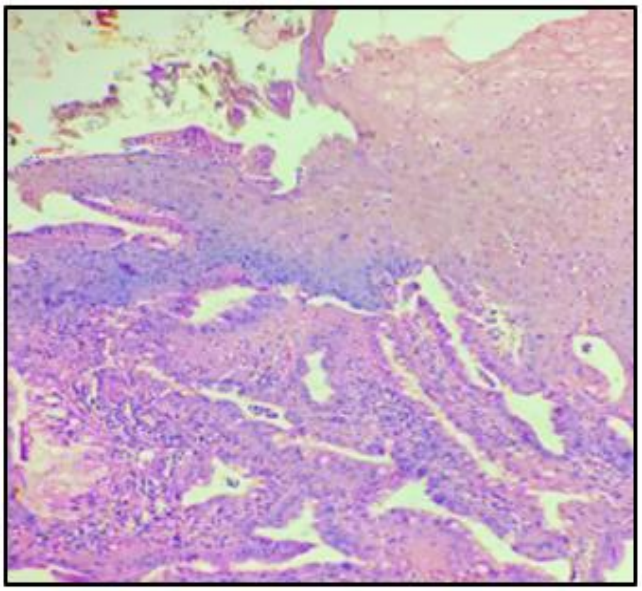

Fig. 3: Squamous epithelium showing intestinal metaplasia, exhibiting goblet cells in Barrets esophagus

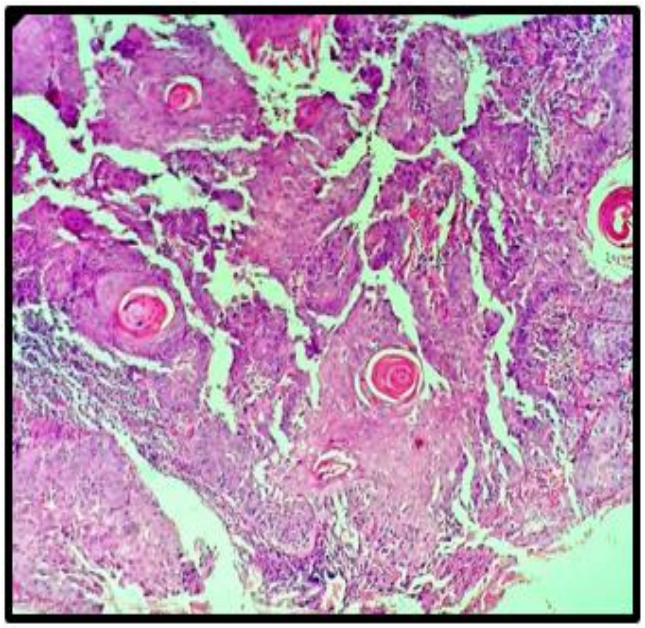

Fig. 4: Well differentiated squamous cell carcinoma of esophagus.

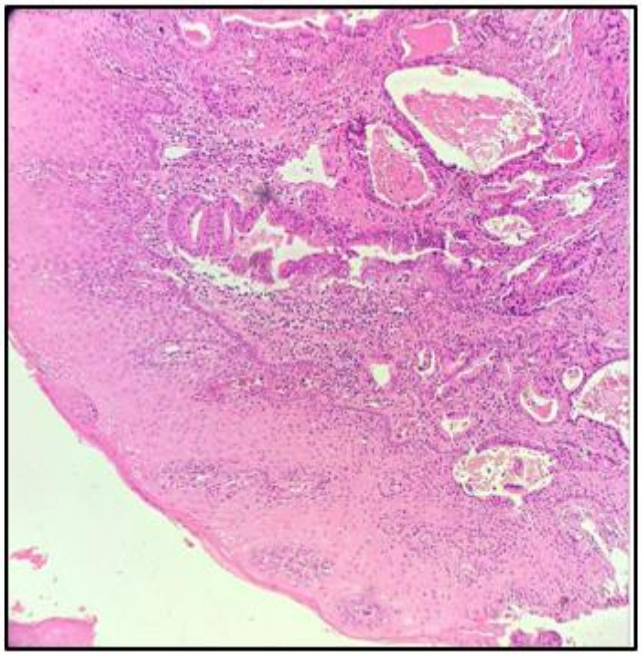

Fig.5: Adenocarcinoma of esophagus showing atypical glands underlying the squamous epithelium

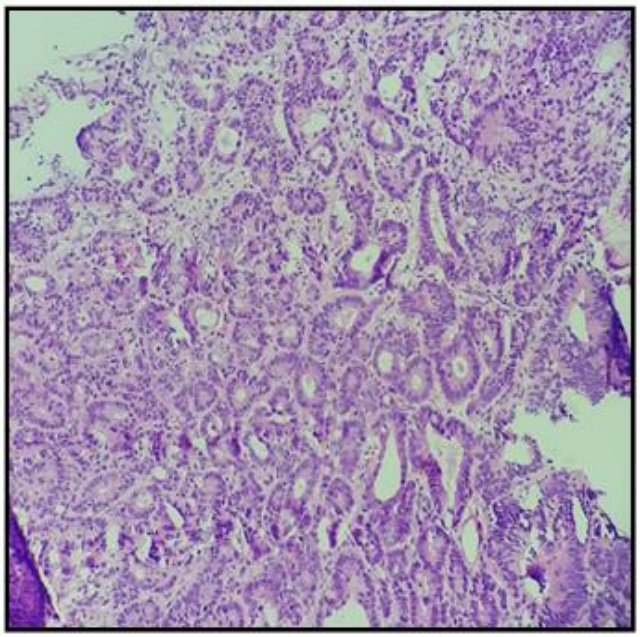

Fig.6: well differentiated adenocarcinoma in gastric epithelium.

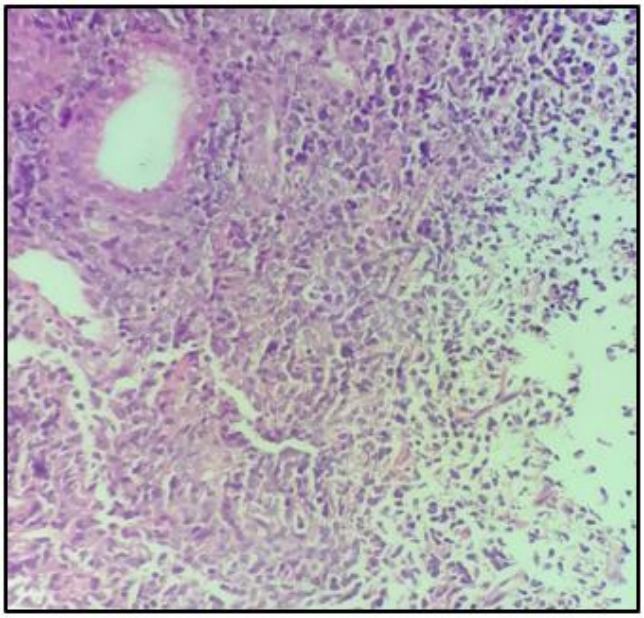

Fig.7: Monomorphic sheets of atypical lymphocytes in Non-Hodgkin lymphoma in gastric biopsies

DISCUSSION

Endoscopic biopsy, coupled with subsequent histopathological analysis, emerges as a foremost diagnostic modality for discerning both neoplastic and non-neoplastic gastrointestinal lesions with precision.

In the present study, it is evident that majority of the upper GI endoscopic biopsies were from esophagus, where as studies reported by Rashmi et al[8], Memon et al[9], and Abilash SC et al [5], show gastric

are more common.

Overall, older patients underwent endoscopic biopsies as compared to young, majority were in the age group of 5th to7th decade of life in the present study. The results are almost comparable to the study by Rashmi et al[8], Abilash SC et al[5], and Shanmugaswamy et al[6]. This is because the likelihood of malignancy rises with age, and any suspicious findings during endoscopy in elderly patients necessitate histopathological analysis. The present study M:F ratio is 1.1:1.

ESOPHAGUS

In the present study, majority of the malignancies were seen arising in the middle esophagus (47.83%), followed by lower esophagus (43.48%), and then, upper esophagus (8.69%). The results were comparable to the study by Khuroo et al[9], Rashmi et al[3], and Abilash SC et al[5].

Neoplastic lesions (90%)were more commonly encountered in esophagus than non-neoplastic lesions. Our findings were similar to the study done by Somani et al(1).The present study showed the most common histological type of malignancy in esophagus to be squamous cell carcinoma.The same results were seen in the study by Rashmi et al[8], Mchembe et al[12], Abilash SC et al[5] and Shanmugaswamy et al[6].

Majority of them are moderately differentiated squamous cell carcinoma accounting to 68 %, followed by well and poor differentiation. One biopsy showed sarcomatoid differentiation.The other malignant neoplasms encountered was Adeno carcinoma(4%) Poorly differentiated carcinoma (1%)and Hodgkin lymphoma(1%).

Most patients with esophageal carcinoma were found to be in the 6th-7th decades of lives.The other studies by Gulia et al[2], and Khandige et al[11] showed slightly early presentation of esophageal malignancy in the 5th-6th decade.Esophageal cancer often presents at a later age primarily because the absence of serosa and the distensibility of the esophagus delay symptom manifestation until the tumor has progressed significantly.Females were predominantly affected in esophageal malignancies, i.e, male to female ratio is 0.68:1.

STOMACH

In our study Neoplastic lesions are more common than non-neoplastic lesions in stomach. Our findings were similar to that of Sheikh et al[4].In this study, the reduced incidence of non-neoplastic lesions could stem from a tendency to provide symptomatic treatment for clearly non-neoplastic cases.Among the non-neoplastic lesions, highest number of cases in gastritis fell under the group of chronic non-specific gastritis accounting for 61% cases. Similar observation was made by Rashmi et al[8] (37% cases) while Jawalkar et al[13] reported 65.22% cases.

Majority of the gastric malignancies arise in the antrum and pylorus region of stomach. Similarly, higher involvement of antrum and pylorus by gastric malignancies was seen in the study by Rashmi et al[8] and Sheikh et al[4].

In the present study, most common histological type of gastric malignancy was adenocarcinoma which was seen in 74 cases (88%) out of 84 cases,and others were poorly differentiated carcinoma,squamous cell carcinoma, Non hodgkin lymphoma and adenoma.there were 3 cases of signet ring cell carcinoma.Rashmi, et al [8] and K C Shiva Raj et

al[15] also found adenocarcinoma as most common histological type.

Majority of the people having gastric malignancy were in the age group of 50-60 years, which is similar to the study by Khandige et al[11] and Mabula et al[14] .Males were predominantly affected in gastric malignancies with M:F ratio of 1.8:1.Similar male predominance was seen in the study by Khuroo et al[10], Mabula et al[14], and Sheikh et al[4].

DUODENUM

In the present study, out of the 8 cases 5 (62%) of duodenal biopsies showed chronic non-specific duodenitis.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 al[4] and Krishnappa R et al [2].

All the 3 neoplastic lesionsof duodenum were adenocarcinoma (100%).This finding was confirmed by Sheik BA et al [4] in their study which also showed that adenocarcinoma is the commonest neoplastic lesion of duodenum. Most common age group affected was between 44-68yrs.Out of 3 neoplastic lesions 2 cases were female and 1 was male.

CONCLUSION

Most common location for upper GI endoscopy is esophagus.The most common lesion among upper GI biopsies is neoplastic. Upper GI endoscopy proves to be a reliable and fitting initial assessment for individuals experiencing upper GI symptoms. Histopathology stands as the gold standard for diagnosing lesions identified during endoscopic examination.

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