International Journal of Clinical and Diagnostic Pathology

ISSN (P): 2617-7226
ISSN (E): 2617-7234
www.patholjournal.com
2020; 3(3): 176-181
Received: 22-06-2020
Accepted: 24-07-2020

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Analysis of histomorphological patterns of upper GI endoscopic biopsies in a tertiary care centre

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DOI: https://doi.org/10.33545/pathol.2020.v3.i3c.278

Abstract
Background: Upper gastrointestinal endoscopic biopsy is an established mode of investigation and Histopathological evaluation of these biopsies is mandatory particularly in the investigation of dysphagia, dyspepsia, GI bleeding, inflammatory conditions and carcinomas.
Aims and Objectives: To analyse the various histomorphological spectrum of endoscopic biopsies of upper GI lesions and document pattern of diseases in the tertiary care hospital.
Materials and Methods: Prospective study of 75 endoscopic biopsy specimens received in pathology lab at our tertiary care centre for one year.
Biopsies were immediately fixed in 10% buffer formalin & routine tissue processing done, sections were cut 3-5 µ, stained with haematoxylin & eosin and special stains wherever necessary
Results: Among the 75 biopsies studied 24 were from esophagus, 46 from stomach and 5 were from upper duodenum and the most common lesions encountered were chronic gastritis and esophageal squamous cell carcinoma, h pylori gastritis, adenocarcinoma of stomach and polyps, few rare lesions are celiac sprue and less common were duodenal lesions. The lesions commonly seen were from stomach in middle age group and detected in males frequently.
Conclusion: Histopathological evaluation of endoscopic biopsy not only permits the exact diagnosis but also early detection of pathologic process and institution of appropriate therapy. Chronic gastritis is the most common lesion detected in upper GI biopsies. Gastric carcinoma most commonly found in antrum.

Keywords: Endoscopy, adenocarcinoma, gastritis, barrets

1. Introduction
The histomorphological array of Upper gastrointestinal lesions especially malignant tumors in combination with endoscopic findings plays an significant portrayal in the diagnosis of upper gastrointestinal tract neoplasms and therefore guidance in their early management which significantly affects the prognosis [1].
The Upper Gastrointestinal tract lesions are the problematic ones which we come across in daily clinical practice which poses high degree of morbidity and mortality, Endoscopic examination and removal of biopsy is the routine procedure done in the hospitals to diagnose divergent lesions and categorise them into benign and malignant. Histopathological examination is considered gold standard to detect the endoscopic lesions [2, 3].
It is a simple and convenient outpatient procedure for the assessing the patients with gastrointestinal tract symptoms [4].
The combined outcome of Upper GI endoscopy and histopathological biopsy examination plays a significant role in the early diagnosis of malignancies of GIT and leads to an opportunity for a wide variety of treatment ranges and potential for a possible cure
Neoplastic lesions are most commonly encountered in the Upper gastrointestinal tract
Gastric adenocarcinoma is the second most common neoplasm Worldwide and esophageal carcinoma is positioned the sixth leading cause of death [5, 6].
In India, according to the National Cancer Registry of India declares that stomach and esophageal cancers are the cancers commonly found in males and esophageal cancer ranks third among females after breast and cervical cancer.

2. Aims and objectives
1. To analyse the various histomorphological spectrum of endoscopic biopsies of upper GI lesions and document pattern of diseases in the tertiary care hospital

2. To diagnose the lesions early in the pathological processes and better management which lowers the risk of advanced malignancies.

3. Materials and Methods

A prospective study was conducted from January 2019 to December 2019 in the Department of Pathology at Shridevi Institute of Medical sciences and Research hospital, on all upper gastrointestinal endoscopic biopsies. 75 biopsies were taken during one year

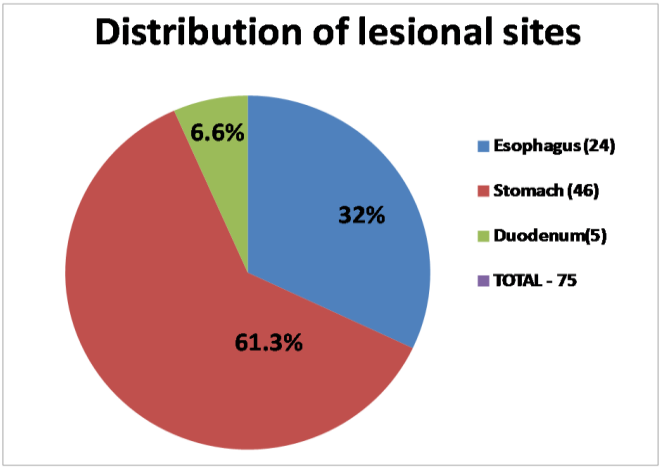
Patients of all ages and both sexes were included in the study who have undergone endoscopic biopsy. Individual patient details like age, sex, and clinical presentations along with the endoscopic biopsy report were taken and recorded.

All the biopsies received were fixed in 10% formalin and the number of fragments counted and regular tissue processing is done. The sections were cut and 3- 4 µ and stained with Haematoxylin and Eosin (H&E) stain. Special stains like Giemsa for confirming H pylori and PAS stain for candidal spores were done whenever necessary. The histopathological examination and reporting of neoplastic and non-neoplastic lesions on the H& E sections and of all the biopsies and special stains wherever necessary were done by a minimum of two Pathologists.

4. Results

4.1 Distribution of lesional sites

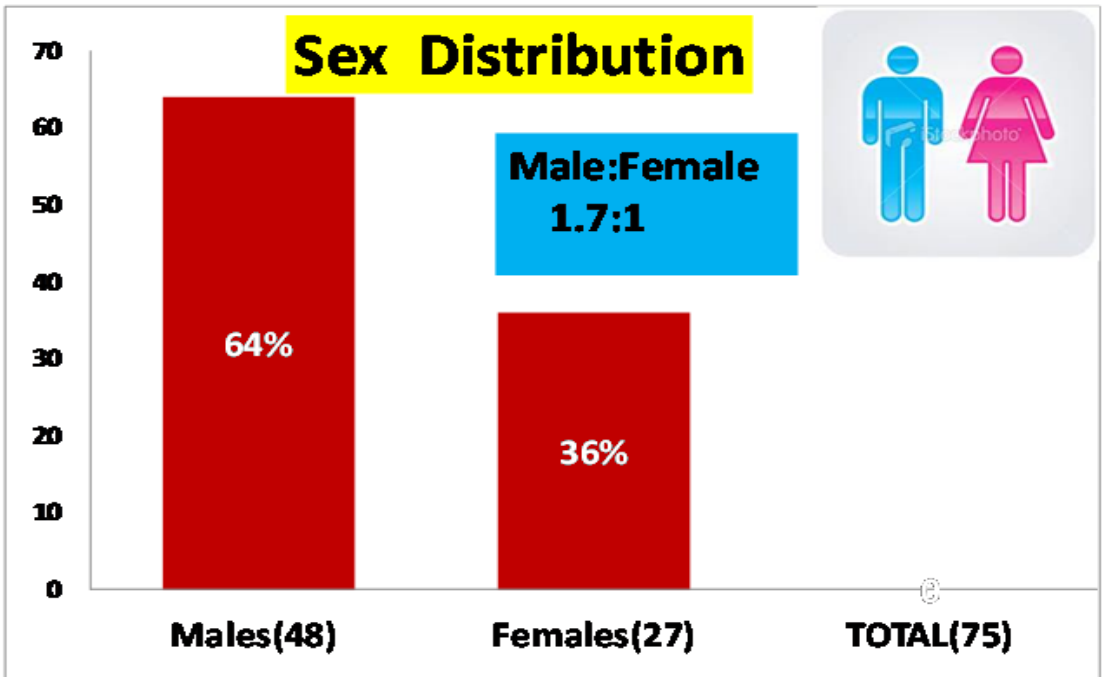
The study comprised of seventy-five upper gastrointestinal endoscopic biopsies, of which 24 (32%) cases were esophageal biopsies, 46 (68%) were gastric biopsies and only five cases (6%) were duodenal biopsies. Stomach is the most prevailed site for upper gastrointestinal endoscopic lesions followed by esophagus and few cases are from duodenum (Graph 1).



Graph 1: Site wise distribution of Upper GI lesions

4.2 Sex wise distribution of upper GI Biopsies

Out of 75 patients with upper gastrointestinal tract endoscopic biopsies, 64% were males and 36% were females. This was also proved by study conducted by Shennak MM *et al*. and JC Paymaster *et al*. also favoured our results by presenting the male: female ratio was 2.03: 1. This concludes probably the fact that males are exposed to more risk factors than females (Graph 2)

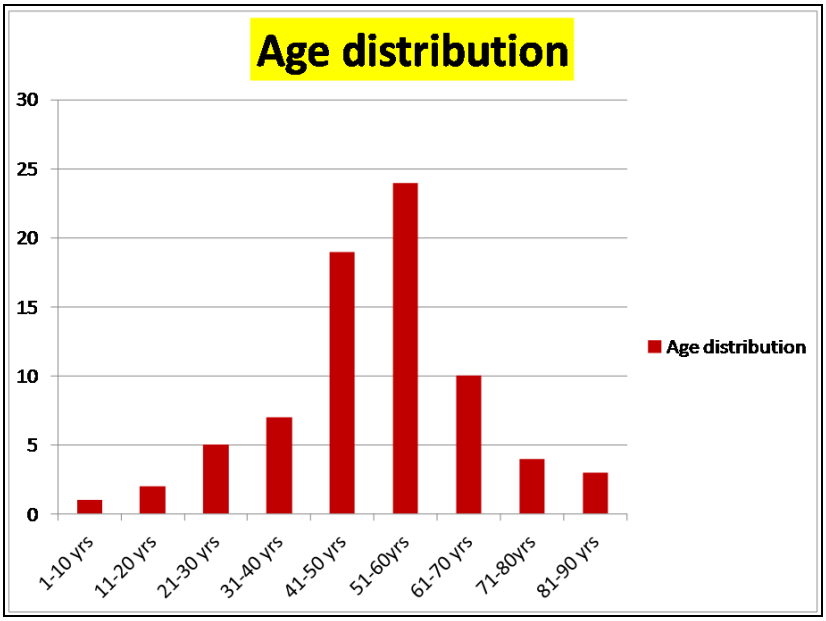


Graph 2: Sex distribution of Upper GI lesions

4.3 Age wise distribution of upper GI Biopsies

The most prevalent age group for this upper gastrointestinal tract disease is between 51-60 years accounting for 24%. The youngest patient in our study was 10 years old diagnosed with celiac sprue and the oldest patient was 85 years with esophageal carcinoma.

The possible cause maybe the variation in exposure to the risk factors (Graph 3)



Graph 3: Age wise distribution of Upper GI lesions

4.4 Spectrum of histopathological lesions in esophagus

Table 1: Distribution of various esophageal lesions

Distribution of esophageal lesions		
Type	**Lesion**	**Number of cases**
Inflammatory	Chronic esophagitis	4
Infections	Candidiasis	1
Metaplastic	Barrets esophaguas	1
Premalignant	Severe dysplasia and carcinoma *in situ*	1
Malignant	Squamous cell carcinoma Adenocarcinoma	16 1
Total		24

4.5 spectrum of histopathological lesions in stomach

Table 2: Distribution of various Gastric lesions

Distribution of gastric lesions		
Type	**Lesion**	**Number of cases**
Inflammatory	Chronic gastritis H Pylori gastritis	20 11
Metaplasia	Chronic gastritis with intestinal metaplsia	1
Polyps	Adenomatous polyp Hyperplastic polyp	1 2
Malignant	Adenocarcinoma Lymphoma	1 1
Total		46

4.6 Spectrum of histopathological lesions in duodenum

Table 3: Distribution of various duodenalal lesions

Distribution of Duodenal lesions		
Type	**Lesion**	**Number of cases**
Inflammatory	Chronic duodenitis	2
Malabsorption syndrome	Celiac sprue	1
Polyps	Adenomatous polyp	1
Malignant	Adenocarcinoma	1
Total		5

5. Discussion

5.1 Histomorphological spectrum of Esophageal lesions

Esophageal lesions were more common in age group above 40 years and most of them were males. Neoplastic lesions (17/24) were more common than non- neoplastic lesions (7/24) and were more common in lower 1/3rd of esophagus

Chronic nonspecific esophagitis is the most common non neoplastic lesion followed by candidiasis and barrets esophagus which was also similar to the study conducted by Rashmi. *et al.* [7]

Our study showed that majority of neoplastic lesions are squamous cell carcinoma except we had only one case of adenocarcinoma. Although there is rise in incidence of adenocarcinoma in many other countries including India, our study did not have enough evidence to prove that mainly due to bounded number of biopsies studied. The Esophageal carcinoma most commonly occurred in the middle third and few cases in lower third Which was confirmed by two studies by khadam et.al and Sandhya *et al.* [8, 9]

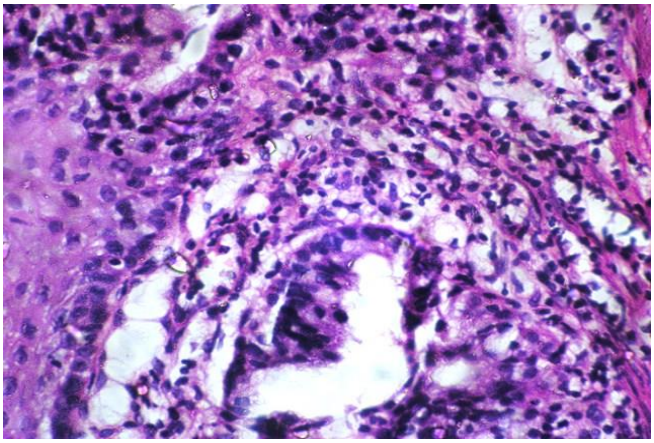


Fig 1: H& E 40X: Barrets esophagus: Intestinal metaplasia showing columnar epithelium & goblet cells

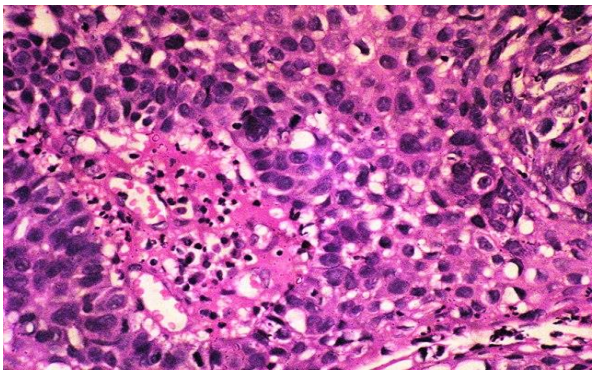


Fig 2: H& E 40X: Moderately differentiated Squamous cell carcinoma esophagus showing Moderate pleomorphism & atypia with few mitoses

5.2 Histomorphological analysis of Gastric lesions

Gastric lesions were more common in age group 40-70 years. Inflammatory lesions (35/46) were more common than neoplastic lesions (11/46) The gastric biopsies are most commonly done to encounter various types of gastritis and, gastric ulcers and divergent tumors.

5.2.1 Distribution of gastric biopsy site

The majority of our upper GI endoscopic biopsies were taken from the Stomach identical to the study by Shennek MM *et al*. The antral part of the stomach followed by the body of the stomach was biopsied in large numbers and few biopsies were taken from the cardia and fundus. Of the total 46 patients biopsied for gastric pathology, 32patients (69.5%) were categorized into inflammatory lesions and 14 patients (24%) showed benign and malignant lesions. Among the non-neoplastic lesions of the stomach, chronic non-specific gastritis is the most common diagnosis which is followed by H pylori gastritis and few cases with metaplastic changes. Gastritis related to Helicobacter pylori shows positive among eleven patients.

The Helicobacter pylori (H. pylori) organisms are more frequently detectable within the mucus layer and in the gastric pits visible on Hematoxylin and Eosin staining and meager numbers are more readily seen with the help of Giemsa stain. More precisely Warthin Starry Stain demonstrates H. pylori but is expensive and rarely used in routine work [8, 12]

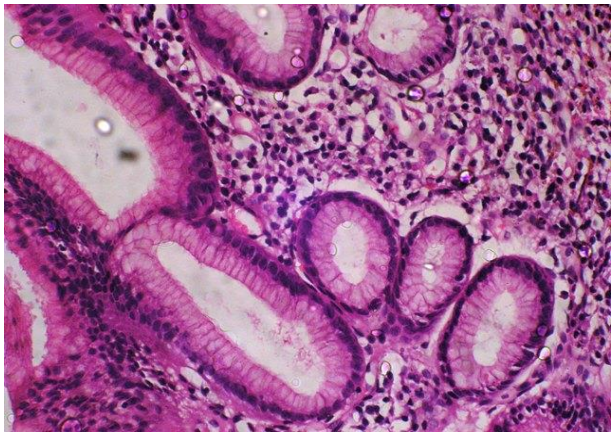


Fig 3: H& E 40X: Chronic nonspecific gastritis showing Chronic inflammatory infiltrate – lymphocytes, plasma cells and eosinophils

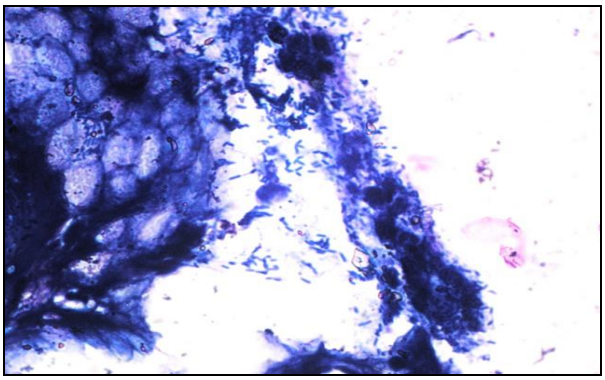


Fig 4: Giemsa stain 40X Gastric mucosa showing H Pylori organisms

5.2.2 Spectrum of neoplastic lesions of the stomach

Among 14 neoplastic lesions of the stomach, about 11 cases were malignant and three cases showed benign morphology. This has also substantiated by an ample number of studies, which implies that malignant neoplasm is more prevalent than benign tumors.

Appertaining to the total number (46) gastric lesions studied, 33 were males and 13 females. This shows that males were affected more commonly than females. Malignant lesions outnumbered benign lesions in both the sexes.

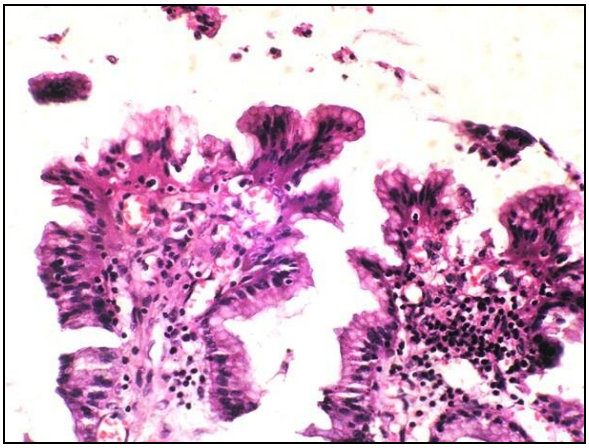


Fig 5: H& E 10X Hyperplastic polyp: Cork screw shaped foveolar glands composed of mature absorptive & mature goblet cells, basal nucleus & abundant cytoplasm filled with mucin

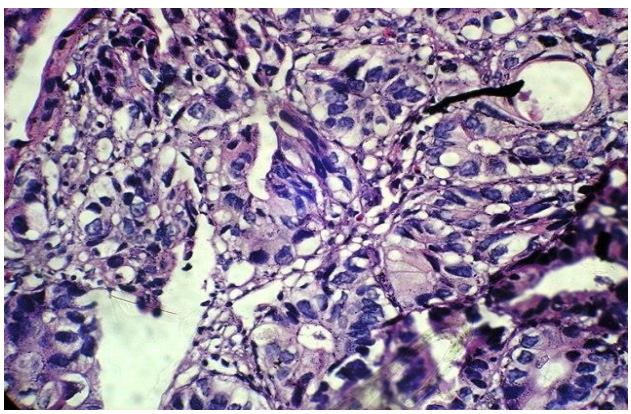


Fig 6: H& E 40X Adenocarcinoma intestinal type showing glands lined by columnar epithelium and signet ring cell

5.2.3 Site wise distribution of gastric carcinoma

The current study, the distribution of gastric carcinoma is as follows: Pylorus with 48% in the pylorus, cardia 23%, body with 24% each followed lastly by fundus with 5%, which is similar to other studies done by Morson *et al*. In the present study, the majority of carcinoma of the stomach endoscopically presented as ulcerative and ulceroproliferative growth, few cases presented as flattened and erythematous and showed microscopic morphology of poorly differentiated adenocarcinoma which was slightly more common than well and moderately differentiated (44%) adenocarcinoma.

5.3 Varieties of lesions were documented in the duodenal endoscopic biopsies.

Duodenal lesions in upper gastrointestinal tract biopsies: Only five patients with duodenal lesions involving the upper parts of duodenum were biopsied among which two patients had chronic nonspecific duodenitis followed by one patient each with celiac sprue, Adenomatous polyp and adenocarcinoma of duodenum.

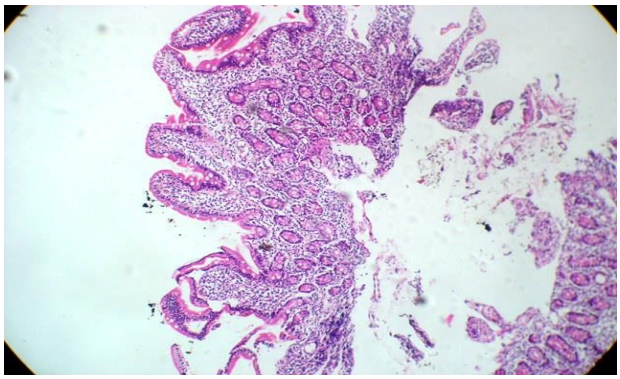


Fig 7: H& E 10X celiac sprue showing blunting and atrophy of villi & lymphoplasmacytic infiltrate in lamina propria with intraepithelial lymphocytes.

6. Conclusion

The upper GI endoscopic biopsy is proved to be a considerable breakthrough in the diagnosis of esophageal-gastroduodenal lesions.

The age range is from 10-85 years, the youngest patient 10 years male with celiac sprue while the oldest (85) presented with squamous cell carcinoma of the esophagus.

Chronic gastritis is the most common lesion detected in upper GI biopsies and gastric carcinoma most commonly found in the antrum.

Diagnosis of endoscopic Upper GI lesions were well correlated with the histopathological diagnosis. Gastric malignancies which presents mostly as ulcers or flat lesions may lead to misconception endoscopically. Hence, utmost care should be taken not to misinterpret any premalignant and malignant lesions, while taking biopsy along with sufficient clinical history, with proper fixation and processing of the tissue and reporting by the pathologist

The histopathological examination followed by endoscopic biopsy shows a significant portrayal of the diagnosis and treatment of upper GI lesions.

Histopathological evaluation of endoscopic biopsy not only permits the exact diagnosis but also early detection of pathologic processes like atrophy, dysplasia, and metaplasia and can also forbid the advancement of these lesions to invasive cancers by appropriate therapy.

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