



Histopathological Study of Upper Gastrointestinal Tract Endoscopic Biopsies in a Teaching Hospital

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Abstract: Background: When a patient has an upper gastrointestinal disorder-which frequently manifests as dyspepsia-upper gastrointestinal endoscopy is considered the preferred diagnostic procedure. Without a biopsy, endoscopy cannot be considered complete, and the most reliable method for diagnosing lesions seen during endoscopy is histopathology. **Methodology:** This retrospective study was conducted in the Department of Pathology at A.C.S Medical College and Hospital for one year duration from July 2022 to July 2023. A total of fifty-five endoscopic biopsy specimens were obtained; they were preserved in 10% formalin and regularly stained with hematoxylin and eosin. **Results:** The majority was found to be 45.4% (25/40) of those aged 61-70, 36.3% (20/55) of those aged 51-60, and 18.1% (10/55) of those aged 40-50. Thirty patients (18.7%) had duodenal lesions, 80 cases (50%) had stomach lesions, and 50 cases (31.2%) had oesophageal lesions. Most upper gastrointestinal tract endoscopic biopsies came from the stomach. **Conclusion:** Endoscopy is insufficient without biopsy, and the gold standard for diagnosing lesions seen during an endoscopy is histopathology. The particular location of mucosal lesions can be seen with the use of upper gastrointestinal tract endoscopy. Therefore, we may draw the conclusion that using these two approaches together offers a potent diagnostic tool for improved patient care.

Key Words: duodenal lesions; gastric lesions; oesophageal lesions

I. INTRODUCTION

Gastrointestinal illnesses constitute a significant burden in clinical practice, contributing to both morbidity and mortality [1]. Specimens obtained from the mucosa of the esophagus, stomach, and duodenum play a crucial role in diagnostic procedures. In the realm of surgery, endoscopy-guided biopsies are the recommended method, providing essential information for diagnosis and subsequent treatment decisions [2]. Histopathological diagnosis becomes particularly critical in cases involving polypoid lesions, ulcerative lesions, and ambiguous findings during endoscopy. Combined with biopsy, upper gastrointestinal (GI) endoscopy is indispensable for the early detection of GI neoplasms, offering various therapeutic options, including potential curative interventions [3]. The development of an appropriate treatment plan relies, in part, on histological confirmation of the final diagnosis of gastrointestinal lesions.

The esophagus and stomach are susceptible to a diverse range of conditions, including infections, inflammatory disorders, vascular issues, mechanical problems, and chemical

or physical reactions, such as radiation damage and neoplasms [4]. The current gold standard for evaluating individuals presenting with gastrointestinal symptoms involves endoscopic biopsy examination, a generally safe procedure followed by histopathologic assessment [5].

This study aims to characterize the spectrum of histopathological lesions affecting the gastrointestinal tract.

II. MATERIALS AND METHODS

This cross-sectional study was conducted in the Department of Pathology at A.C.S Medical College and Hospital over one year, from July 2022 to July 2023. The study included 55 individuals with gastrointestinal complaints who underwent endoscopic biopsies for diagnostic purposes.

INCLUSION CRITERIA

- Endoscopic biopsies from the stomach, duodenum, and esophagus in both male and female patients of all ages.

EXCLUSION CRITERIA

- Individuals with a history of prior treatment for gastrointestinal tract cancer.
- Pharyngeal and oral cavity biopsies.
- Recurrent malignancies of the upper gastrointestinal tract.
- Specimens from esophagectomy, colectomy, stomach resections, and colon resections.

III. METHODOLOGY

Upon receipt in appropriately labeled, securely sealed containers with 10% formalin, the biopsies underwent a thorough examination to assess their quantity and appearance. Following sufficient fixation, the entire sample underwent standard processing before being embedded in paraffin, with the mucosal surface positioned on top. Sections, five microns thick, were cut perpendicular to this surface using a rotating microtome, resulting in the preparation of three to four serial sections per slide. Sections were mounted with cover slips using Distyrene Plasticizer Xylene (DPX) as the mountant after being stained with Hematoxylin and Eosin. Special stains, such as Gomori's methenamine silver (GMS) and periodic-Schiff (PAS) stains for fungi, the reticulin stain for assessing the degree of atrophy in the stomach mucosa, and the Giemsa stain for identifying organisms like *Helicobacter pylori*, were used when necessary.

IV. STATISTICAL ANALYSIS

The collected data were compiled in a master chart, and analysis and computations were performed as required. Quantitative and qualitative variables were represented as percentages.

V. RESULTS AND OBSERVATION

The age range of the participants in this study varied from 20 to 70 years. The majority, 45.4% (25/40), belonged to the 61-70 age group, followed by 36.3% (20/55) in the 51-60 age group and 18.1% (10/55) in the 40-50 age group.

In this study, 81.8% of the participants were male (45/55), while 18.1% were female (10/55).

A total of 55 biopsy samples from the Upper Gastrointestinal Tract (UGIT), including those from the esophagus (27.2%, 15/55), stomach (54.5%, 30/55), and duodenum (18.1%, 10/55), were examined.

The majority of patients in the third decade underwent esophageal and stomach biopsies, with a higher frequency of biopsies from both sites in males than in females. In the fourth decade, duodenal biopsies were performed on patients most frequently, with men predominating over women in this setting as well.

DISTRIBUTION OF CASES BASED ON THE SITE

Thirty patients (18.7%) had duodenal lesions, 80 cases (50%) had stomach lesions, and 50 cases (31.2%) had esophageal lesions. The majority of UGIT endoscopic biopsies originated from the stomach (Table 1).

Non neoplastic Esophageal lesions (10)	No. of cases	Percentage
Normal study	2	13.3
Chronic non specific esophagitis	8	53.3
Neoplastic Esophageal lesions (5)		
Low grade dysplasia	1	1.8
High grade dysplasia	1	1.8
Squamous cell carcinoma	2	13.3
Adenocarcinoma	1	1.8
Total	15	99.9%

TABLE 1: Distribution of Esophageal Lesions

Non neoplastic Gastric lesions (20)	No. of cases	Percentage
Acute gastric ulcer	3	10
Chronic peptic ulcer	5	16.6
Chronic non-specific antral gastritis	10	33.3
Hyperplastic polyp	2	6.6
Neoplastic Gastric lesions (10)		
Gastric adenocarcinoma	7	16.6
Signet ring cell adenocarcinoma	3	16.6
Total	30	99.9%

TABLE 2: Distribution of Gastric Lesions

In the present study, among oesophageal biopsies, 66.6% (10/15) were non-neoplastic, and 33.3% (5/15) were neoplastic. Among the non-neoplastic lesions, 53.3% (8/15) had persistent non-specific esophagitis. Neoplastic lesions included adenocarcinoma and high-grade dysplasia. Two cases (13.3%) of squamous cell carcinoma of the oesophagus were identified, exhibiting cellular characteristics of malignancy and penetration into the underlying stroma.

The distribution of biopsy sites in the oesophagus was as follows: middle esophagus (20%), upper esophagus (14%), and lower end of the esophagus (66.6%). The majority of esophageal biopsies were taken from individuals in their sixth decade (35%) and seventh decade (10%), with a male-to-female ratio (M:F) of 2:1 (Table 2).

In the present study, among gastric biopsies, 66.6% (20/30) were non-neoplastic, and 33.3% (10/30) were neoplastic. Among the non-neoplastic lesions, 10% (3/30) were acute gastric ulcers at the body, 16.6% (5/30) were chronic peptic ulcers at the pylorus, 33.3% (10/30) were chronic non-specific antral gastritis at the antrum, and 6.6% (2/30) were hyperplastic polyps at the pylorus. Neoplastic lesions included three cases (1%) of signet ring cell adenocarcinoma and seven (23.3%) cases of stomach adenocarcinoma (Table 3).

In our study, it was observed that a majority of the patients, constituting eighty percent (8/10), exhibited chronic duodenitis, whereas a smaller proportion, specifically two percent (2/10), presented with *H. pylori*-associated duodenitis. Notably, in the fourth decade, duodenal biopsies were most frequently conducted, and a notable male predominance

Duodenal lesions	No. of cases	Percentage
Chronic duodenitis	8	80
H pylori duodenitis	2	20
Total	10	100

TABLE 3: Distribution of Duodenal Lesions

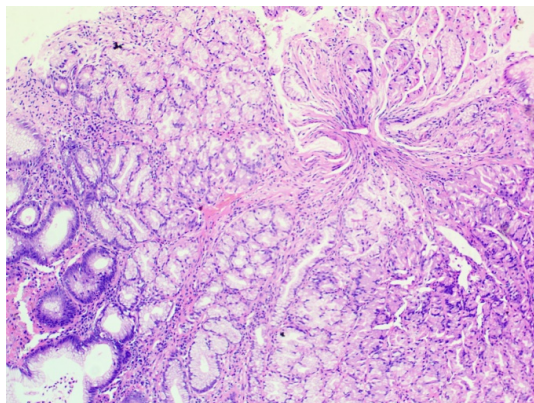


FIGURE 1: Chemical Gastritis. Lamina Propria Expansion with Fibromuscular Hyperplasia. (4X, H & E)

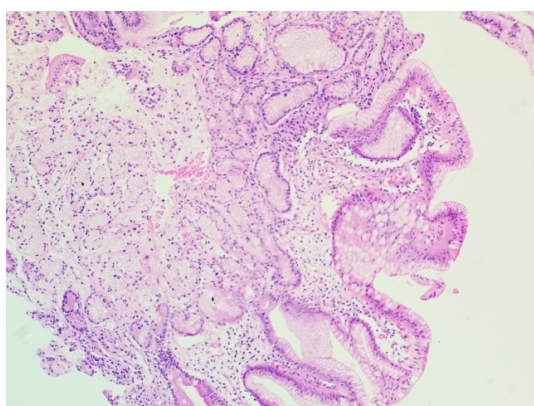


FIGURE 2: Chronic Duodenitis. Foveolar Metaplasia and Brunner Gland Hyperplasia. (10X ,H & E)

over females was evident in this demographic context.

VI. DISCUSSION

The upper gastrointestinal system is a frequent site for various abnormalities, particularly malignant tumors. Globally, esophageal carcinoma ranks as the sixth leading cause of

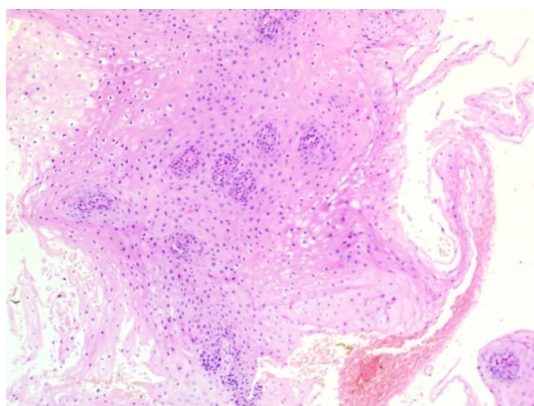


FIGURE 3: Reflux Esophagitis. Inflammatory Cells in the Squamous Epithelium. (40X ,H& E)

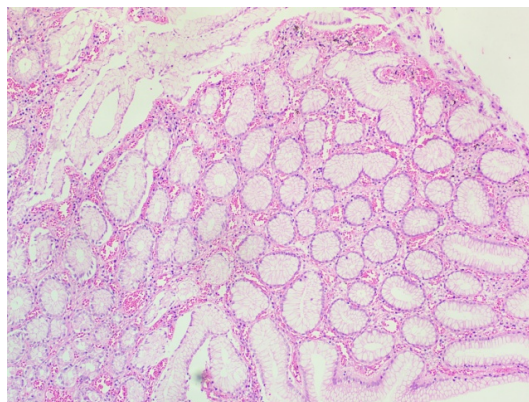


FIGURE 4: Hyperplastic Polyp. Edematous Lamina Propria with Inflammation and Congestion. (40X, H&E)

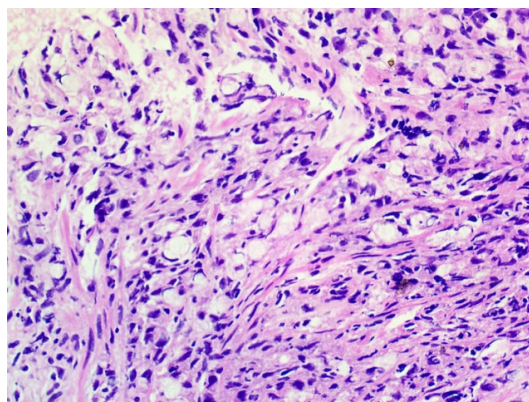


FIGURE 5: Gastric Biopsy Showing Signet Ring Cell Carcinoma. Signet Cells having Cytoplasmic Mucin with an Eccentrically Placed Nucleus. (40X, H&E)

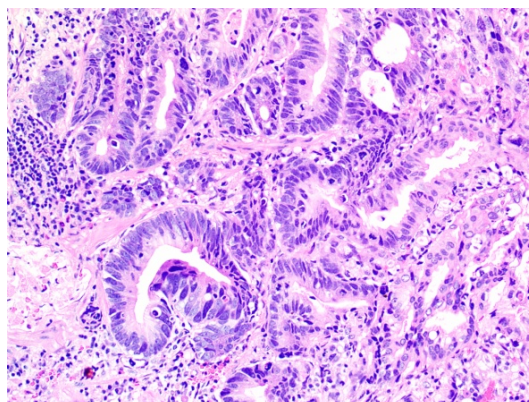


FIGURE 6: Gastric Biopsy showing Adenocarcinoma. Tubular Neoplastic Glands Invading the Muscle. (40X, H&E)

death, and stomach carcinoma is the second most common type of cancer. Early cancer detection significantly enhances patients' chances of survival, and upper GI endoscopy, coupled with biopsy, is the most precise and sensitive diagnostic technique for identifying gastric, duodenal, and esophageal cancers [6].

COMPARATIVE STUDIES RELATED TO AGE DISTRIBUTION

In our research, participants aged between 20 and 70 years were included, with the majority falling in the 61-70 age group (45.4%, 25/40), followed by the 51-60 age group (36.3%, 20/55) and the 40-50 age group (18.1%, 10/55). Males constituted 81.8% (45/55) of the participants, while females comprised 18.1% (10/55). In a study by Nazrin *et al.* [7], out of 135 cases, 61.14% were males, and 38.86% were females, with a male-to-female ratio of 1.6:1. The mean age of the study population was 53.20, ranging from 18 to 85.

COMPARATIVE STUDIES RELATED TO CLINICAL SYMPTOMS

In our study, dysphagia, vomiting, and abdominal pain were the most common clinical symptoms. Similar findings were reported by Nazrin *et al.* [7]. In the study by Mathew *et al.* [8], dysphagia was the most prevalent symptom, followed by nausea, stomach discomfort, vomiting, dyspepsia, lack of appetite, and weight loss.

COMPARATIVE STUDIES RELATED TO DISTRIBUTION OF CASES BASED ON THE SITE

In our study, 30 patients (18.7%) had duodenal lesions, 80 cases (50%) had stomach lesions, and 50 cases (31.2%) had esophageal lesions, with the majority of UGIT endoscopic biopsies originating from the stomach. In Nazrin *et al.*'s study [7], the distribution of lesions was as follows: esophagus 39.25%, gastroesophageal junction 4.45%, stomach 45.18%, and duodenum 11.12%. Sahu *et al.*'s study [9] included 64 patients with upper gastrointestinal tract biopsies, where 37.5% had esophageal biopsies, 32.82% had duodenal biopsies, and 29.68% had stomach biopsies.

COMPARATIVE STUDIES RELATED TO ESOPHAGEAL LESIONS

In our study, 33.3% (5/15) of esophageal biopsies were neoplastic, while 66.6% (10/15) were non-neoplastic. Among the non-neoplastic lesions, 53.3% (8/15) were persistent non-specific esophagitis. Neoplastic lesions included two cases (13.3%) of squamous cell carcinoma and one case each of high-grade dysplasia and adenocarcinoma. In Nazrin *et al.*'s study [7], out of 53 esophageal biopsies, 84.92% had neoplastic lesions, with 73.60% being squamous cell carcinoma and 11.32% adenocarcinomas. Mathew *et al.* [8] reported that neoplastic lesions (69.20%) were more common in the esophagus than non-neoplastic lesions (30.80%). The majority of non-neoplastic lesions were due to reflux esophagitis. Sahu *et al.*'s study [9] observed instances of

reflux esophagitis and Barrett's esophagus among esophageal biopsies, with adenocarcinomas being present. Rani *et al.*'s study [10] revealed that 93.3% of esophageal biopsies were neoplastic, with various types of squamous cell carcinoma being predominant.

COMPARATIVE STUDIES RELATED TO GASTRIC LESIONS

In our study, 33.3% (10/30) of gastric biopsies were neoplastic, while 66.6% (20/30) were non-neoplastic. Non-neoplastic lesions included acute gastric ulcers, chronic peptic ulcers, chronic non-specific antral gastritis, and hyperplastic polyps. Neoplastic lesions comprised three cases (1%) of signet ring cell adenocarcinoma and seven cases (23.3%) of stomach adenocarcinoma. In Nazrin *et al.*'s study [7], 55.74% of stomach biopsies had non-neoplastic lesions, while 44.26% had neoplastic lesions, including squamous cell carcinoma and adenocarcinoma. Ganga and Indudhara [11] reported various lesions in stomach biopsies, including H. pylori-associated gastritis, fundic gland polyps, hyperplastic polyps, and adenocarcinomas. Sahu *et al.*'s study [9] found chronic atrophic gastritis, acute on chronic gastritis, and other lesions in stomach biopsies, with cases of adenocarcinoma. Rani *et al.*'s study [10] noted both neoplastic and non-neoplastic lesions in gastric biopsies, with H. pylori gastritis, fundic gland polyps, and adenocarcinomas being prevalent.

COMPARATIVE STUDIES RELATED TO DUODENAL LESIONS

In our study, 80% (8/10) of duodenal biopsies showed chronic duodenitis, and 20% (2/10) had H. pylori-associated duodenitis. In another study [11], malignant lesions of the duodenum included adenocarcinomas and carcinoids. Sahu *et al.*'s study [9] found various lesions in duodenal biopsies, including eosinophilic enteritis/duodenitis, chronic non-specific inflammatory inflammation, celiac disease, tropical sprue, and granulation of ulcer. Rani *et al.*'s study [10] reported neoplastic and non-neoplastic lesions in duodenal biopsies, including celiac disease, adenocarcinoma, and normal histology.

VII. CONCLUSION

Histopathology is the gold standard for the diagnosis of endoscopically detected lesions and endoscopy is incomplete without biopsy. The particular location of mucosal lesions can be seen with the use of upper gastrointestinal tract endoscopy. Therefore, we may draw the conclusion that using these two approaches together offers a potent diagnostic tool for improved patient care.

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CONFLICT OF INTERESTS

The authors declare no conflicts of interest.

AUTHORS' CONTRIBUTIONS

All authors contributed equally to this paper. They have all read and approved the final version.

CONSENT

Informed consent was obtained from all participates in the study as needed.

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