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Histopathological spectrum of upper gastrointestinal endoscopic biopsies in a rural teaching hospital

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Abstract

Background: Gastrointestinal tract complaints are prevalent among individuals in rural settings, encompassing all age groups. This study aimed to examine histopathological lesions in the upper gastrointestinal tract through endoscopic biopsy and determine the frequency of various upper gastrointestinal lesions in relation to age, sex, and site.

Methods: The specimens included in our study comprise endoscopic biopsies of the upper gastrointestinal tract during October 2018 to October 2020. A total of 70 biopsies from the upper gastrointestinal tract were analyzed using endoscopy. All specimens were fixed in 10% formalin and processed following routine hematoxylin and eosin (HE) examination. Special stains were employed when necessary.

Results: Among the 70 upper gastrointestinal endoscopic biopsies studied during this period, 25 (35.71%) were from the esophagus, 35 (50.0%) were from the stomach, and 10 (14.29%) were from the duodenum. Of the 70 upper gastrointestinal endoscopic biopsies, 34 displayed inflammatory lesions, while 36 exhibited neoplastic lesions. There was a male predominance among the cases examined. Non-neoplastic lesions were observed in individuals aged from the second to the fifth decade, while neoplastic lesions were more prevalent in older age groups.

Conclusion: This research highlights the stomach as the predominant location for inflammatory and neoplastic lesions in the upper gastrointestinal tract. The study reveals a notable occurrence of gastric carcinoma among malignant upper gastrointestinal lesions. Thus, early detection and management of upper gastrointestinal lesions necessitate endoscopy and subsequent histopathological evaluation.

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Introduction

The upper gastrointestinal (GI) tract consists of the oral cavity, salivary glands, esophagus, stomach, and small intestine (duodenum, jejunum, and ileum) (1). Disorders affecting the upper GI tract often present with a similar group of symptoms, making clinical assessment challenging (2,3). Upper GI endoscopy, which provides visualization of the upper GI tract up to the duodenum, is an established diagnostic and therapeutic procedure for a wide range of upper GI conditions. It also allows for the biopsy of both neoplastic and non-neoplastic lesions. This procedure is simple, safe, well-tolerated, and offers direct visualization of the pathological site, enabling early detection of pathological changes and facilitating the initiation of appropriate treatment (3).

Endoscopic biopsy examination, followed by histopathological assessment, is a convenient and currently accepted gold standard for accurately and objectively evaluating patients with upper GI symptoms (4,5).

Upper gastrointestinal tract (GIT) disorders are among the most frequently encountered issues in clinical practice, often associated with significant morbidity and mortality. Endoscopic biopsy is a common procedure performed in hospitals to investigate a variety of benign and malignant lesions. Evaluating the upper GIT can provide critical information that informs decisions about future surgical interventions. Consequently, having a comprehensive understanding of the spectrum of lesions that can be diagnosed in these specimens is essential for making accurate diagnoses and improving patient management (6-11).

Therefore, the present study was conducted at our tertiary care center to assess the histopathological spectrum of various upper GIT lesions in relation to clinical and endoscopic findings. Additionally, we aimed to determine the frequency of occurrence of these lesions in relation to age and sex.

Methods

The present study was conducted at our tertiary care center and involved the examination of 70 patients to assess the histopathological spectrum of various upper GIT lesions in relation to clinical and endoscopic findings. The study also aimed to determine the frequency of occurrence of these lesions with respect to age and sex.

This prospective study spanned a period of 2 years and included 70 patients. Inclusion Criteria: The study encompassed all endoscopic biopsies of the upper GIT received in the Department of Pathology.

Exclusion Criteria: Biopsies of the oral cavity and pharynx, as well as biopsies beyond the second part of the duodenum, were excluded from the study.

Methodology: Following approval from the Institutional Ethics Committee (Reference No. IEC 531 dated 10/10/2018), valid informed consent was obtained from all participants. Once enrolled, patients underwent a thorough history and physical examination according to a predefined form. Relevant patient information, including age, registration number, presenting signs and symptoms, as well as past medical history and endoscopic findings, were recorded. The collected biopsies were placed in properly labeled and tightly sealed containers containing 10% formalin. These specimens were grossly examined to assess their number and appearance. After adequate fixation, the entire biopsy was processed routinely and embedded in paraffin with the mucosal surface positioned uppermost. Thin sections, approximately 4-5 microns thick, were cut perpendicular to this surface using a rotary microtome, with 3-4 serial sections prepared on each slide. Subsequently, these sections were stained with hematoxylin and eosin (H&E). Special stains, such as Giemsa, were applied when necessary. The histopathological classification of tumors followed the recommendations of the World Health Organization (WHO).

Results

The present study is a prospective analysis of 70 consecutive upper GI endoscopic biopsies received in the Department of Pathology at our college. It aimed to determine the spectrum of upper GI lesions through endoscopic biopsies. Below are the results of the analysis of these seventy cases.

Out of the 70 upper GI endoscopic biopsy samples studied during the period, 25 (35.71%) were from the esophagus, 35 (50.0%) from the stomach, and 10 (14.29%) from the duodenum.

The highest number of biopsies were performed on patients between 51 and 60 years and 61 to 70 years (21.4%), followed by 41 to 50 years (15.7%). The lowest incidence was observed in the age group of 11-20 years (1.7%), followed by 31 to 40 years (11.8%). Among the patients, there were 47 males and 23 females, resulting in a male-to-female ratio of 2.1:1.

Among the patients, 72.80% presented with dyspepsia, while 64.20% reported dysphagia. Other chief complaints included abdominal pain, retrosternal burning, vomiting, loss of appetite, weight loss, and nausea. (Figure1)

Upon histopathological examination of endoscopic biopsies from the upper GIT, it was observed that inflammatory lesions were the most common (48.57%), followed by malignant lesions (38.58%). Benign lesions accounted for 12.85% of the cases. (Table1)

Result shows that non-neoplastic lesions accounted for 48.57% of all upper GI biopsies in the present study. Gastric lesions (24.28%) were the most commonly found, followed by esophageal lesions (12.85%) and duodenal lesions (11.42%). The most commonly encountered non-neoplastic lesions were esophagitis, chronic gastritis, and chronic duodenitis.

Premalignant lesions accounted for 7.20% of all biopsies and were primarily observed in the esophagus. Dysplasia in the esophagus accounted for 1.50% of all biopsies, while dysplasia was not seen in biopsies from the stomach and duodenum. Barrett's esophagus (Figure 2a) was seen in 5.20% of all esophageal biopsies.

In terms of neoplastic lesions in the upper gastrointestinal (GI) tract, the study identified four cases (5.20%) of benign polyps, comprising three hyperplastic gastric polyps and one inflammatory polyp.

A total of 27 cases (38.57%) of upper GI malignancies were identified, with 15.71% in the esophagus (Figure 2b), 20% in the stomach, and 2.85% in the duodenum. Male predominance was observed in all malignancies. (Table 1)

Out of 32 patients suspected of having malignancy on endoscopy, 27 (38.57%) of them showed malignancy on histopathology. The remaining 5 cases (7.14%) were benign on histopathology. Among the 10 (14.28%) patients suspected of having benign lesions on endoscopy, 9 cases (12.85%) turned out to be benign, while 1 (1.42%) was malignant histopathologically. Twenty-eight (40%) patients had different endoscopic findings, such as ulceration, hyperemia, reddish mucosa, and whitish worms. These were non-neoplastic lesions histopathologically.

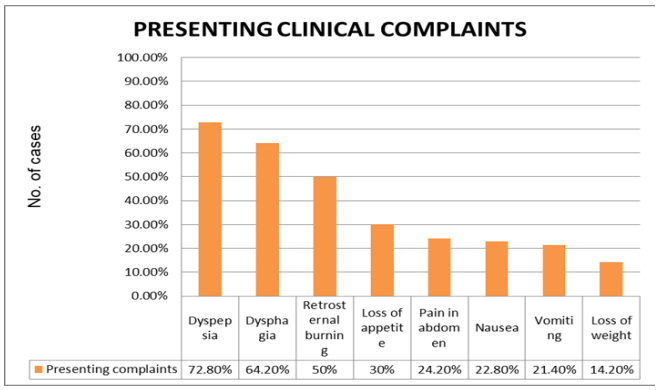

Figure 1. Clinical presentation of the upper gastrointestinal endoscopic biopsies

Table 1. The incidence of Upper Gastrointestinal Lesions in the present study

Histopathological diagnosis	Number	%
Acute esophagitis	5	7.20%
Chronic esophagitis	4	5.20%
Barret's esophagus	4	5.20%
Moderate dysplasia of the esophagus	1	1.50%
Squamous cell carcinoma of the esophagus	7	10%
Adenocarcinoma of esophagus	4	5.20%
Acute gastritis	1	1.50%
Chronic gastritis	8	11.45%
Helicobacter pylori gastritis	2	2.85%
Superficial gastritis	3	4.30%
Eosinophilic gastritis	3	4.30%
Hyperplastic gastric polyp of stomach	3	4.30%
Inflammatory polyp of stomach	1	1.50%
Non-Hodgkin lymphoma of the stomach	1	1.50%
Signet ring cell carcinoma of the stomach	3	4.30%
Adenocarcinoma of stomach	10	14.30%
Acute duodenitis	1	1.50%
Acute duodenal perforation	1	1.50%
Chronic duodenitis	5	7.20%
Parasite- Ancylostoma duodenale	1	1.50%
Adenocarcinoma of the duodenum	2	2.90%
Total	70	100%

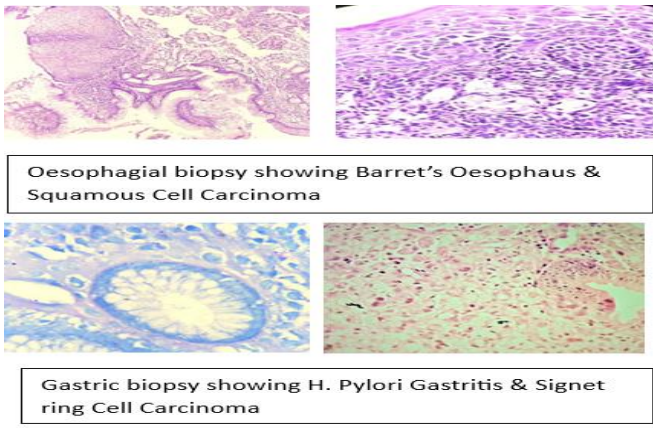

Figure 2. Histopathological images of interesting cases

Discussion

The present study was conducted at our tertiary care center on 70 patients to assess the histopathological spectrum of various upper GIT lesions in relation to clinical and endoscopic findings, as well as to determine their frequency of occurrence based on age and sex.

In the present study, the most common site for biopsy was the stomach (50%), followed by the esophagus (35%) and duodenum (15%). This finding aligns with the studies conducted by Jaynul Islam SK et al. (12), Ganga H et al. (13), Somani NS et al. (14), Mohan B et al. (15), Rashmi K et al. (3), Sharma et al. (16), Aparajita A et al. (17), Bhat N et al. (18), Syed Imtiyaz Hussain et al. (19), and Veenaa Venkatesh et al. (20).

In our study, most of the cases were between 50-70 years of age. This finding is consistent with the studies conducted by Jaynul Islam SK et al. (12), Somani NS et al. (14), Aparajita A et al. (17), Siddiqui et al. (21), Syed Imtiyaz Hussain et al. (19), and Mittal T et al. (22).

In the present study, a male preponderance was observed, with a male-to-female ratio of 2.1:1. This finding is in line with the studies conducted by Jaynul Islam SK et al. (12), Ganga H et al. (13), Somani NS et al. (14), Rashmi K et al. (3), Sharma et al. (16), Patil AS et al. (23), Aparajita A et al. (17), Bhat N et al. (18), Siddiqui et al. (21), Sahu PR et al. (24), Puturaju S et al. (25), Syed Imtiyaz Hussain et al. (19), Mittal T et al. (22), Thapa R et al. (26), and Veenaa Venkatesh et al. (20).

The most common clinical symptom in the present study was dyspepsia (72.85%), followed by dysphagia (64.8%). This finding is consistent with the studies conducted by Somani NS et al. (14), Mohan B et al. (15), Qureshi N A et al. (27), and Syed Imtiyaz Hussain et al. (19).

In the present study, the most common non-neoplastic esophageal lesion was esophagitis (12.40%), followed by a neoplastic lesion, squamous cell carcinoma (10.0%). These findings align with studies conducted by Jaynul Islam SK et al. (12), Ganga H et al. (13), Somani NS et al. (14), Mohan B et al. (15), Rashmi K et al. (3), Qureshi N A et al. (27), and Sharma S et al. (28).

The most common site for esophageal malignancy in the present study was the middle one-third (32.0%) of the esophagus. Squamous cell carcinoma (10%) was the predominant lesion, while adenocarcinoma was seen in 5.20% of cases. These findings were consistent with studies done by Jaynul Islam SK et al. (12), Mohan B et al. (15), Rashmi K et al. (3), Somani NS et al. (14), and Ganga H et al. (13), where squamous cell carcinoma was the most common malignancy, occurring predominantly in the middle third of the esophagus.

In the present study, the most common lesions found in the stomach were inflammatory (48.5%), followed by malignant lesions (40%), while benign lesions constituted 11.5%. The most common non-neoplastic lesion was chronic gastritis (28.58%), and 2.85% of cases showed *Helicobacter pylori*-associated gastritis. The most common malignant lesion in gastric biopsies was adenocarcinoma (28.58%), followed by signet-ring cell carcinoma (8.58%). Endoscopically, malignant lesions showed predominantly ulcerative proliferative growth and polypoidal growth. These findings are consistent with studies conducted by Jaynul Islam SK et al. (12), Ganga H et al. (13), Somani NS et al. (14), Mohan B et al. (15), Qureshi N A et al. (27), Sharma S et al. (28), Rashmi K et al. (3), and Shilpi Sahu et al. (29).

In the present study, the most common lesions found in the duodenum were chronic duodenitis (50%) and adenocarcinoma (20%). These findings are consistent with studies conducted by Mohan B et al. (15) and Veenaa Venkatesh et al. (20).

Out of all biopsies done in the present study, the most common malignancies observed were from the stomach (20.10%), followed by the esophagus (15.20%) and duodenum (2.90%). This is comparable to findings in studies by Somani NS et al. (14), Veenaa Venkatesh et al. (20), and Syed Imtiyaz Hussain et al. (19).

Conclusion

Biopsy sampling of the upper GI mucosa during diagnostic endoscopy provides valuable information. Endoscopy, when combined with biopsy, becomes a powerful diagnostic tool that significantly contributes to improved patient management. Histopathology is considered the gold standard for diagnosing lesions detected through endoscopy. Biopsy offers an excellent opportunity for clinicians and histopathologists to correlate clinical data, endoscopic findings, and pathological lesions.

The present study underscores the importance of upper GI endoscopic biopsy in early detection of malignant lesions, screening for premalignant lesions, and differentiation between non-neoplastic and neoplastic lesions. This, in turn, aids in appropriate patient management.

In conclusion, fiberoptic diagnostic upper GI endoscopy is a relatively less invasive, simple, safe, and well-tolerated procedure. It is cost-effective and provides a high diagnostic yield for confirming various upper GI lesions. In routine clinical practice, histopathology remains the gold standard for definitively diagnosing a wide range of lesions.

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Upper GI endoscopic biopsies are routinely performed for diagnosing and managing patients who present with complaints such as dyspepsia, dysphagia, nausea, vomiting, and retrosternal burning. All the necessary instruments were available in the hospital's histopathology laboratory, and no additional funding was required for this study.

Ethical statement

Approval was obtained from the Institutional Ethics Committee (Reference No. IEC 531, dated 10/10/2018), and valid informed consent was obtained from each patient to participate in the study.

Conflicts of interest

The authors declare that they have no competing interests.

Author contributions

RL collected, analyzed, and interpreted the patient data regarding clinical, endoscopic, and histopathological findings of upper GI endoscopic biopsies. SB performed the histological examination of the upper GI endoscopic biopsies and was a major contributor to writing the manuscript. Both authors have read and approved the final manuscript.

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