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A Study on Endoscopic Guided Biopsy and Its Histopathological Spectrum of Lesions in Upper Gastrointestinal Tract

Dr. Aishwarya S [1], Dr. Eswari Varadarajan[*2]
[1]Post graduate, [2]Professor, Head of Department
Department of Pathology, Meenakshi Medical College Hospital and Research Institute, Enathur, Kanchipuram-631552, Tamilnadu, India

***Corresponding Author:**
Dr. Eswari Varadarajan
Professor and Head of Department, Department of pathology, Meenakshi Medical College Hospital and Research Institute.

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ABSTRACT

Introduction/Background

In a routine surgical practice gastrointestinal disorders are frequently confronted on day -to- day basis. It encompasses a range of disorders which mostly presents with similar complaints. Introduction of fibre-optic upper gastrointestinal endoscopy has been a leap forward in the diagnosis and treatment. This in mutual with histopathological examination of the endoscopic guided biopsy is the current gold standard for accurate diagnosis.

Materials And Methods

This is a retrospective and prospective study of endoscopic biopsies done between 2018 and 2021 at MMCH & RI for evaluation of lesions in upper gastrointestinal tract. The study includes 130 endoscopic biopsies of patients evaluated at Department of pathology, MMCH & RI for various associated symptoms such as abdominal pain, dysphagia, gastric outlet obstruction and anaemia.

Results

Out of 130 endoscopy guided upper gastrointestinal tract biopsies maximum number of cases were from gastric. Most of the patients presented with symptoms of gastric outlet obstruction.

Biopsies were most commonly done in males when compared to females. And the most common age group was from 4^{th} to 7^{th} decade. Most common malignancy reported was adenocarcinoma and the common endoscopy finding was ulceration.55 % of the cases were non neoplastic and 45% of the cases were neoplastic. 93 % of the cases were optimally diagnosed and 7% of the cases were inconclusive / inadequate.

Conclusion

Endoscopy and Histopathological assessment of the biopsy goes hand in hand. The only archetype for a confirmatory diagnosis of the upper gastrointestinal disorders is histopathological examination of the endoscopic guided biopsy.

Keywords: endoscopy, gastrointestinal disorders, histopathology, non -neoplastic & neoplastic.

INTRODUCTION

The upper gastrointestinal endoscopic biopsies include biopsies from oesophagus and up to the second part of duodenum. Symptoms like vomiting, dysphagia, heart burn, abdominal pain & constipation are frequently confronted in a clinic. These symptoms are seen both in neoplastic and non-neoplastic conditions. Due to analogous clinical picture, they impose a great trouble in diagnosis and treatment leading to increased morbidity.[1]

The diagnosis of gastrointestinal tract disorders has become easier after the introduction of fibre- optic endoscopy in 1986.It is effortless, safe and tolerated procedure with direct imaging of the pathological site which is accessible for biopsy taking.[2] This along with histopathological examination of the biopsy material is the current gold standard for accurate assessment.[3]

Endoscopy is also valuable for acknowledging the progress of the disease and used therapeutically. Now with various innovations like disposable endoscopy, chromo endoscopy, capsule endoscopy, video endoscopy, autofluorescence endoscopy and endoscopy guided fine needle aspiration it is creating a revolution in medicine. Endoscopic guided biopsies of upper gastrointestinal tract are most commonly suggested in case of dysphagia, unexplained weight loss, gastric outlet obstruction symptoms, dyspepsia, infections, inflammatory disorders, vascular disorders, mechanical conditions, toxic reactions including radiation injury and finally for neoplasms [2].

Oesophageal carcinomas and gastric carcinomas are more common in males than in females.

AIMS AND OBJECTIVES

To determine the histopathological spectrum of lesions in upper gastrointestinal endoscopic biopsies.

To establish the effectiveness of endoscopic biopsies in diagnosis and management.

To study the spectrum of various neoplastic and nonneoplastic lesions of upper gastrointestinal tract biopsies in correlation with frequency, age, sex, histological and morphological grading and to establish endoscopic biopsies as an effective tool in early diagnosis to aid in management of the patients

MATERIALS AND METHODS

This is a retrospective and prospective study of endoscopic biopsies taken between 2018 and 2020 at MMCH & RI for evaluation of lesions in upper gastrointestinal tract. The study includes 130 endoscopic biopsies of patients of all age groups and both the sex with upper GI symptoms were estimated at Department of pathology, MMCH & RI for associated symptoms such as abdominal pain, dysphagia, anaemia, gastric outlet obstruction.

Endoscopic biopsies were fixed in 10% of formalin and were habitually processed and examined with H&E stain. Special stains like PAS and Toluidine blue stain were used wherever vital.

Endoscopies were performed using a large channel endoscope Olympus HQ190 series. Biopsy specimens were obtained from the lesion site. The biopsy material was put in the filter paper and immersed in 10% formalin for fixation. After sufficient fixation entire tissue was routinely processed and embedded in paraffin. Four-micron thick sections were cut and three to four sections were prepared on each slide. Each section was stained with Haematoxylin & Eosin and studied microscopically. Other special stains were used where ever required. Adequacy of biopsy was assessed. An attempt was made to diagnose the lesion on gross visualization during endoscopy and to correlate them histopathologically. Tumours were diagnosed as per WHO histological classification of gastrointestinal tumours.

INCLUSION CRITERIA

All the endoscopic biopsies of upper GI tract.

EXCLUSION CRITERIA

All the lesions of mouth and pharynx

All the biopsies beyond 2nd part of duodenum

RESULTS

This study was done from January 2018 to March 2020, 130 biopsies were included. Overall, in the present study maximum biopsies (73%) were from persons in 4th to 7th decade of lives (Table-1) with male (63%) to female (37%) and ratio being 1.8: 1 (M: F). Gastric biopsy was maximum (62%), followed by oesophagus (25%) and duodenum (13%).

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AGE GROUPS	NO. OF CASES	PERCENTAGE
Oct-20	2	1.50%
20-30	7	5.50%
30-40	13	10%
40-50	27	21%
50-60	42	32%
60-70	26	20%
70+	13	10%

TABLE 1: Age distribution of the endoscopic guided biopsies.

OESOPHAGUS

In Oesophagus most of the biopsies were from the upper and middle oesophagus (69%) followed by lower oesophagus being (31%). Oesophageal biopsies were most frequently received from 4th to 7th decade (Table 2) and more commonly in males (60%) when compared to females (40%). Most common presentation for the oesophageal lesions was dysphagia, followed by dyspepsia, loss of appetite, weight loss, nausea, vomiting, and hematemesis. The endoscopic findings ranged from erosion to ulceroproliferative growth (Table 3). Neoplastic growth was suspected in 78% of the cases of which after histopathological study showed 72% was neoplastic.

In the present study among the oesophageal biopsies' neoplastic lesions (72%) were more commonly encountered than non-neoplastic lesions (28%). The commonest histopathological diagnosis in non-neoplastic lesions was dysplasia which accounted 13% (Table - 4). The study showed squamous cell carcinoma (47%) as more common than adenocarcinoma (12.5%) in oesophagus and poorly differentiated carcinoma being (12.5%). One case showed well differentiated squamous cell carcinoma with monilial esophagitis (fig 1) .

Age	Inflammatory lesions	Hyperplastic polyp	dysplasia	malignancy
40-49	1	1		7
50-59	1			5
60-69			1	7
70+	1	1	2	3

TABLE 2: Age wise distribution of Histopathological lesions in the oesophagus

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ENDOSCOPIC FINDINGS	NO OF CASES	PERCENTAGE
Ulcer	1	3%
Trachealization	1	3%
Polyp	3	10%
Erosion and white patch	2	6%
Noduloproliferative growth	6	19%
Ulceroproliferative growth	16	50%
Ulcerative growth	1	3%
Flattening of mucosa	2	6%

TABLE 3: Spectrum of endoscopic findings in the oesophagus

HPE Diagnosis	NO OF CASES (32)	PERCENTAGE
Non neoplastic	**7**	
Inflammatory lesions	2	6%
Monilial esophagitis	1	3%
Hyperplastic Polyp	1	3%
Mild dysplasia	2	6%
Moderate dysplasia	1	3%
Neoplastic	**23**	
Squamous cell carcinoma	15	47%
Poorly differentiated carcinoma	4	12.50%
Adenocarcinoma	4	12.50%
Inadequate	**2**	6%

TABLE 4: Spectrum of Histopathological lesions in the oesophagus

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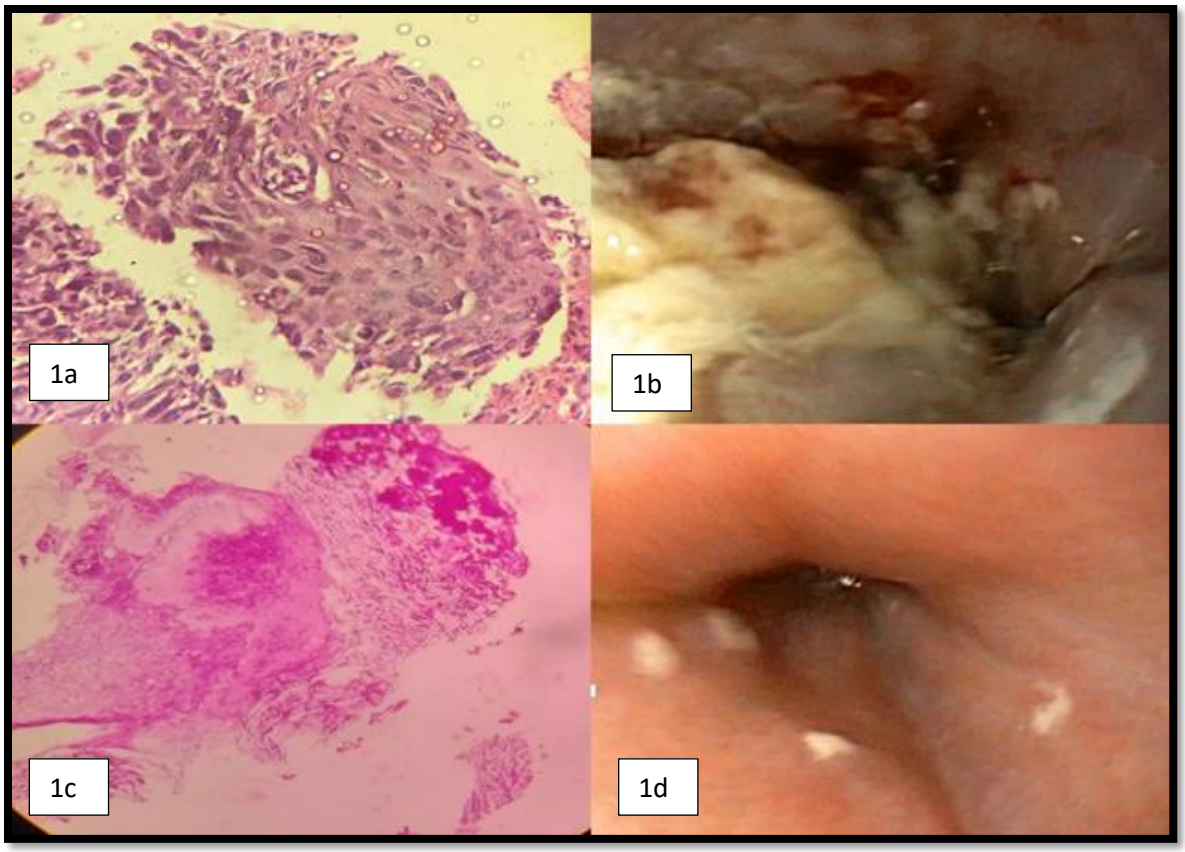

Figure 1 (a, b, c & d) figure 1a - showing a photomicrograph of squamous cell carcinoma oesophagus (H &E in magnification 40x), figure 1b showing endoscopic image of an ulceroproliferative growth, figure 1c showing a photomicrograph of monilial esophagitis (PAS stain in magnification 10x) & figure 1d showing a endoscopic image of monilial esophagitis

GASTRIC

Gastric biopsies were most frequently obtained in 5th and 6th decade (61.50%) with M:F ratio being 1.7:1. The most common site where lesions were noticed was antrum and pylorus (Fig 2) (fig 3).

In the gastric biopsies received 46 cases were non neoplastic lesions making it the majority and neoplastic lesion was 34 cases (fig 3). Among the non-neoplastic lesions, the most common finding was gastritis (34%) which varied from acute gastritis to chronic atrophic gastritis with metaplasia. Helicobacter pylori associated gastritis was encountered in 5 cases (19%) (Fig 4). Malignant lesions in gastric biopsy were 42% of the cases (fig 3).

Majority of the patients with malignant lesions (60%) presented with the symptoms of gastric outlet obstruction. The most common endoscopic finding for malignant lesion ranged from flattening to ulceroproliferative growth (table 5).

Noduloproliferative growth was the most common endoscopic finding. Most common site for gastric malignancy was antrum and pyloric region of stomach (60%) with the majority of patients in their 5th and 6th decades of lives and in males. Among the malignant lesion of stomach, the most common was well differentiated adenocarcinoma (17.2%) (Table 6).

Other cases encountered were gastrointestinal stromal tumour (Fig 5), poorly differentiated carcinoma including signet cell carcinoma (fig 6) & Lymphoma.

Neoplastic lesion was suspected in 50% of the cases after endoscopic evaluation among that following histopathological examination only 40% was regarded as neoplastic, rest were non neoplastic.

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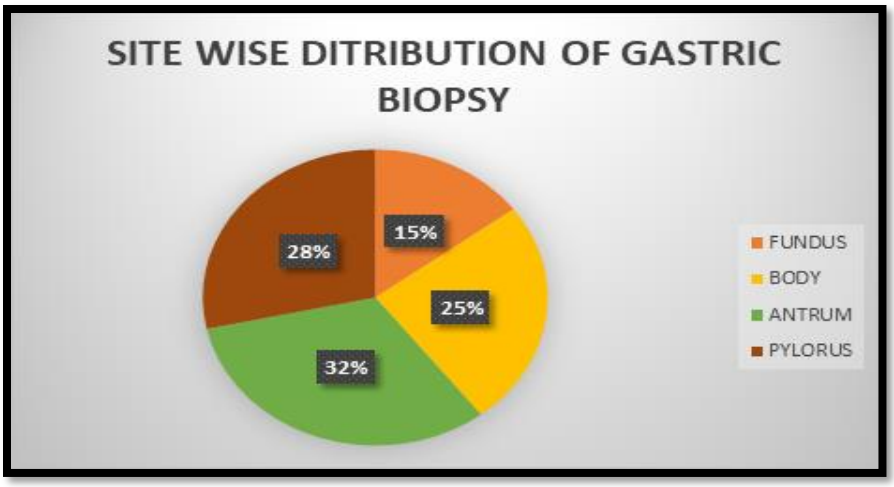

Figure 2 -site distribution in gastric biopsies

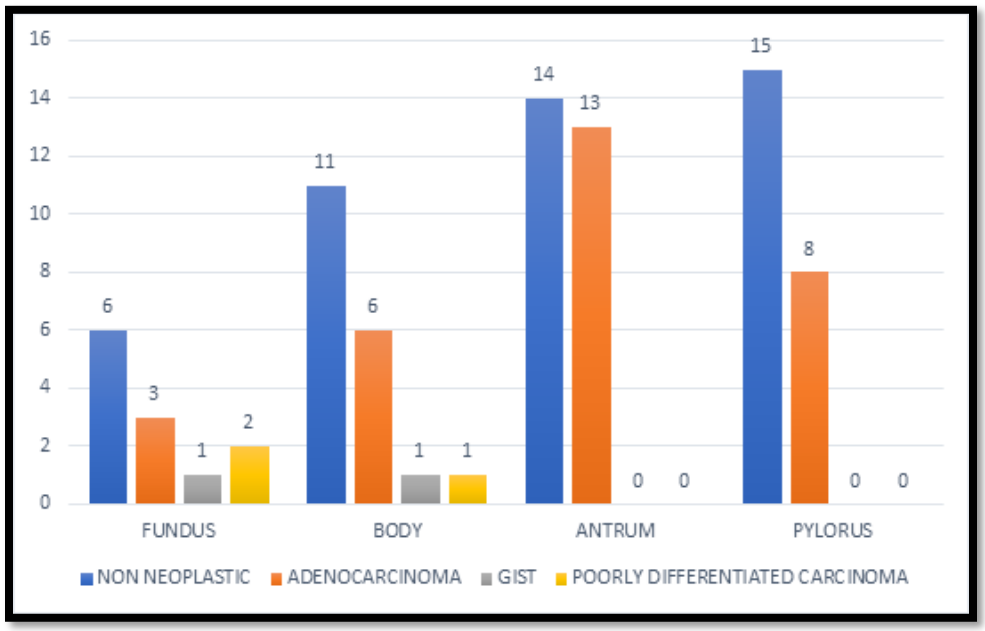

Figure 3- Site wise distribution of histopathological lesion in gastric biopsy

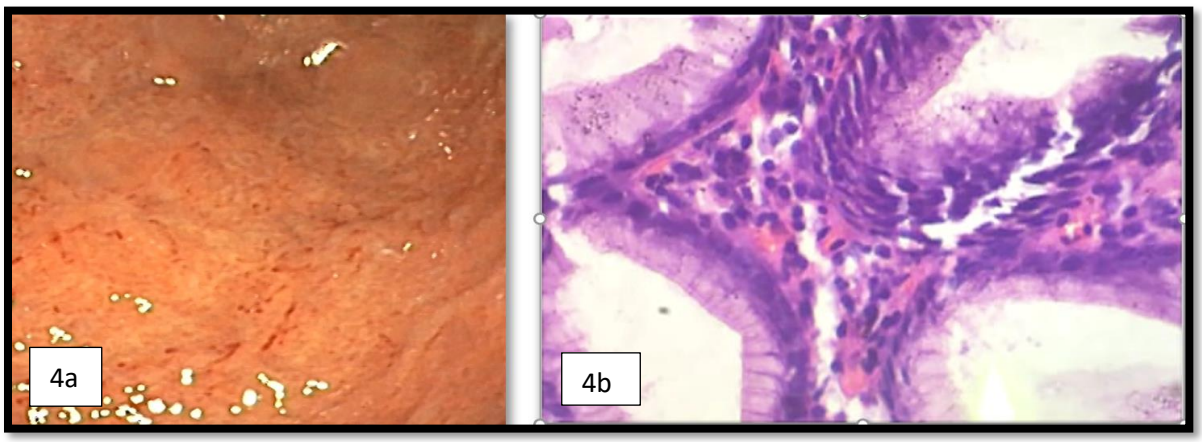

Figure 4 (a & b) -Figure 4a: Endoscopic imagen which shows gastritis, figure 4b: photomicrograph showing helicobacter pylori in H&E stain (magnification x100),

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ENDOSCOPIC FINDINGS	NO OF CASES (81)	PERCENTAGE
Ulcer	23	28.30%
Granular mucosa	1	1.23%
Polyp	14	17.20%
Inflammation and Erosion	9	11.10%
Atrophic mucosa	1	1.23%
Noduloproliferative growth	19	23.45%
ulceroproliferative growth	6	7.40%
Flattening growth	3	3.70%
Ulcerative growth	3	3.70%
Nodular growth	2	2.40%

TABLE 5: Spectrum of endoscopic findings in the gastric

HPE Diagnosis	NO OF CASES (81)	PERCENTAGE
Non neoplastic		
Chronic Gastritis and chronic atrophic gastritis with metaplasia	21	25.90%
Gastric ulcer/ peptic ulcer	6	7.40%
Erosive gastritis	1	1.23%
Acute gastritis	2	2.40%
Helicobacter pylori gastritis	5	6.17%
Hyperplastic polyp	9	11.10%
Low grade dysplasia	1	1.23%
Neoplastic		
Gastrointestinal stromal tumor	2	2.40%
Well differentiated adenocarcinoma	14	17.20%
Moderately differentiated adenocarcinoma	12	14.80%
Poorly differentiated carcinoma	2	2.40%
Lymphoma	1	1.23%
Inadequate / not representative	5	6.17%

TABLE 6 -Spectrum of Histopathological lesions in gastric biopsy.

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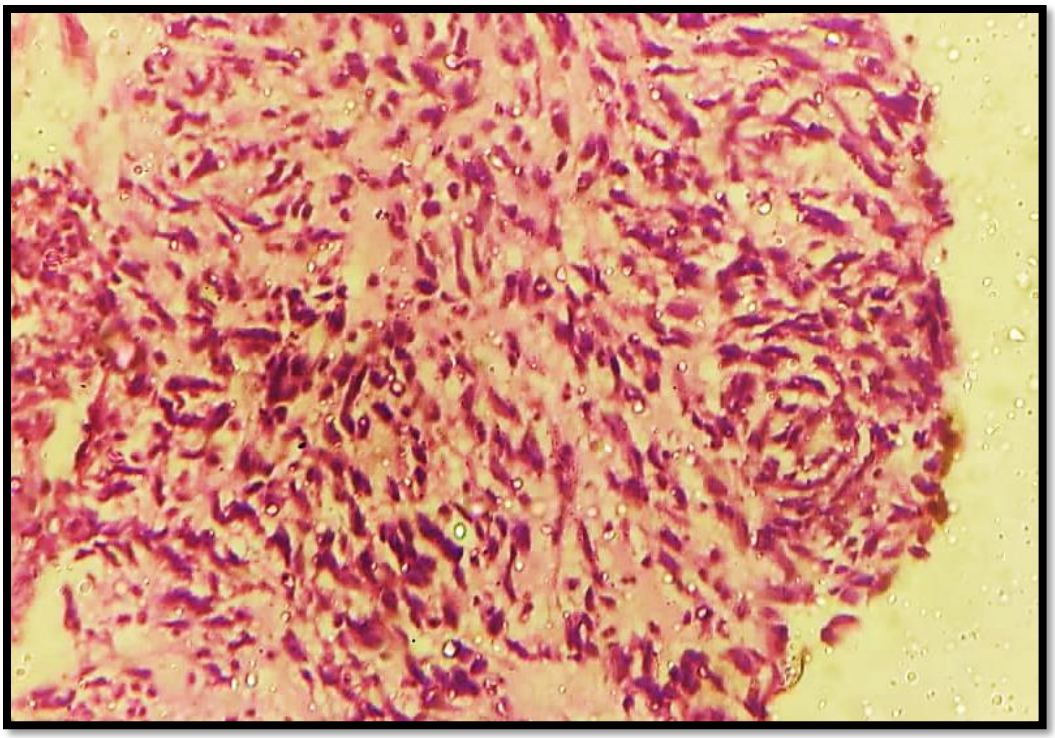

FIGURE 5 -photomicrograph showing gist (magnification 40x)

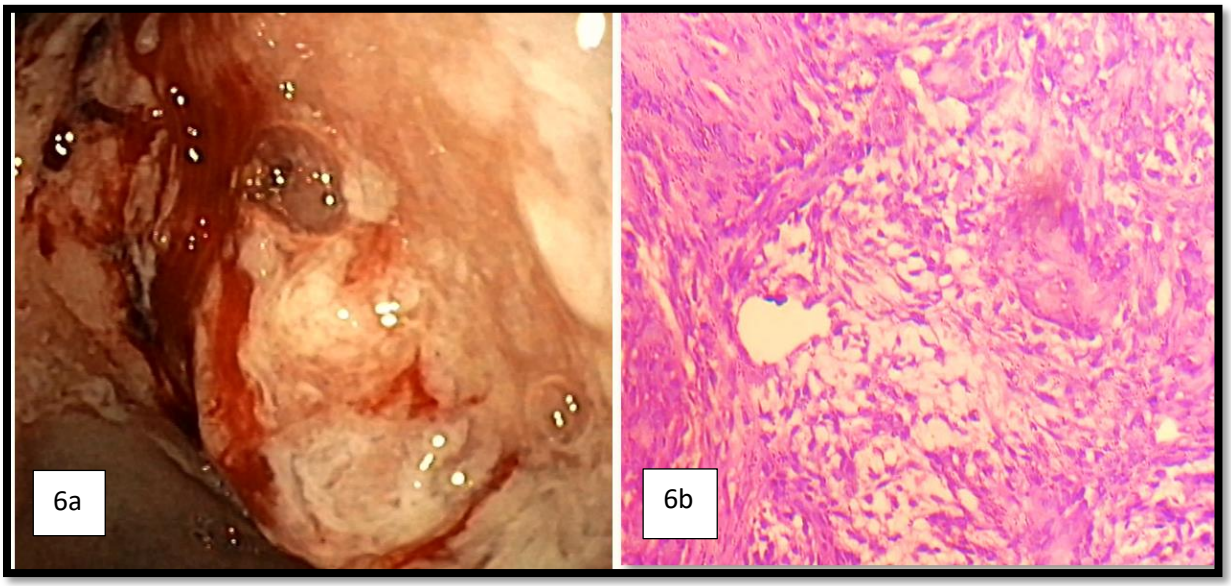

FIGURE 6 (a & b) - Figure 6a showing endoscopic image of an ulceroproliferative growth figure 6b: photomicrograph showing poorly differentiated adenocarcinoma (signet ring cells) (magnification 40X)

DUODENUM

All 17 biopsies from duodenum were benign with maximum cases showing chronic non - specific inflammation (82.3%) .Other lesions encountered were polyp and dysplasia. No malignancy was reported in the present time period. One biopsy was inadequate.

Out of 130 cases 8 biopsy samples was considered inadequate to assess. This was mostly in lesions with malignancy depiction in endoscopy. Thus, stating that endoscopy alone is not sufficient, histopathological assessment of the lesion has to be done earlier in suspicious cases to confirm the diagnosis.

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DISSCUSSION

According to National and International Cancer Registry gastric cancers is fifth most commonly diagnosed cancer and third foremost cause of cancer related death and oesophageal carcinoma being seventh most common. [4].

Histopathological study of endoscopic biopsies is used as a confirmatory tool for the diagnosis in suspected malignant cases or to make diagnosis of benign condition, thus helping in premature therapeutic decision.[5]

After the innovation of fibreoptic endoscopy the usage of endoscopy along with histopathological examination goes hand in hand. There has been a lot of improvement in this field and with rising number of gastrointestinal tract carcinoma. Every elderly patient with suspicious symptoms needs to undertake endoscopic examination followed by histopathological examination.

The present study revealed that most common age group undergoing Endoscopic guided biopsy were in their 4th to 7th decade of life and was largely males with male to female ratio of 1.8:1 which was also observed in other studies done by Krishnappa Rashmi et al. [3] Sandhya PG et al., [6] , Shennak MM et al. [7], and Somani NS et al [8] .

The gender predilection to males is due to the fact that males are more commonly exposed to various risk factors when compared to female and so gastrointestinal malignancies are more common in male gender.[5]

In our study the most common site from which the biopsies were taken was stomach followed by esophagus and then duodenum similar to the studies conducted by Krishnappa Rashmi et al [3]

The gastric lesion was mostly benign which similar to study by Sandhya PG et al. [6] and Kothari SL et al. [9], sheik et al. [10]. Among the non-neoplastic lesions, we observed 27 cases of gastritis, highest number of cases in gastritis fell under the group of chronic non-specific gastritis accounting for 70% cases. Similar observation was made by Jawalkar et al [11] (65.22% cases). Whereas observation made by Krishnappa Rashmi et al [3] (37% cases) and Somani et al [8] reported a lower number (40% cases).

Out of 80 gastric biopsies, 33 were malignant lesions in which the most common was adenocarcinoma similar to study by Krishnappa et al. [3] and sheik et al. [10]

In esophagus malignant lesions were more common accounting for about 72% of the esophageal biopsy which was similar to study by Rao DN et al. [12].

The most common malignancy observed in esophagus was squamous cell carcinoma which was commonly seen in males in their 5th -6th decade of life and the most common site where squamous cell carcinoma was in the upper and middle esophagus [13], whereas in lower esophagus adenocarcinoma was more common, these findings correlated with sheik et al. [10] and Rumana et al. [14].

In this study time period 17 endoscopic biopsies of first part of duodenum were obtained for histopathological assessment. All the cases were benign with majority having findings of non-specific duodenitis similar to Krishnappa et al. [3]

Endoscopy has been a major revolution in the field of medicine making diagnosis easier. In the present study we correlated the endoscopic findings with the histopathological finding. 82% of the endoscopic finding correlated with the histopathological finding. Out of 81 gastric biopsies 62 cases correlated including both neoplastic and non-neoplastic lesions.

Some of the samples were inadequate or not representative of the lesion. Endoscopy though being an easier diagnostic procedure it gives some amount of discomposure to the patient. If the sample is not representative the patient has to undergo the procedure again because histopathological examination is the most important confirmatory tool. Hence attention should be taken in choosing the correct site for biopsy, with adequate clinical information.

CONCLUSION

Endoscopy biopsy of the upper gastrointestinal lesions gives us a prodigious amount of information. Sample taken from a non-representative area and inadequate sampling can be a great delinquent. Endoscopy along with histopathological diagnosis acts as a influential tool together in early diagnosis and treatment.

Endoscopy and Histopathological examination of suspected neoplastic lesions should go in parallel and should never be ancillary to each other.

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