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# Histopathological Study of Endoscopic Upper Gastrointestinal Tract Biopsy

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## ABSTRACT

**Introduction:** Upper gastrointestinal tract disorders are one of the most commonly encountered problems in clinical practice. Endoscopic procedure is performed for a variety of benign and malignant lesions. The definitive diagnosis of upper gastrointestinal tract disorders rests on histopathological confirmation and is one of the bases for proper management and treatment.

**Objective:** To determine the spectrum of histopathological lesions of the upper gastrointestinal tract.

To establish endoscopic biopsy as an effective tool in the proper diagnosis of various upper gastrointestinal tract lesions.

**Material & Method:** A retrospective study of 212 upper gastrointestinal endoscopic biopsies & histopathological assessment was done at the department of pathology, Smt. NHL Municipal Medical College and Sheth VS general hospital from Sep 2018- Feb 2020.

**Results:** Of the total 212 cases of the oesophagus, stomach and duodenal biopsies, 66.98% were non-neoplastic lesions and 33.02% were neoplastic lesions. The most common malignancy was squamous cell carcinoma in the oesophageal biopsy. In stomach biopsy chronic gastritis (37.5%) was the most common lesion. In duodenal biopsy chronic nonspecific duodenitis (75%) was the most common lesion.

**Conclusion:** In our study, the commonest site for upper gastrointestinal tract biopsy was the duodenum (34.38%) with 75% non-neoplastic lesions, followed by oesophagus (33.01%) 31.4% non-neoplastic and 68.57% neoplastic lesions. The least common site for biopsy was the stomach (30.1%). In the stomach, non-neoplastic lesions were more common.

**Key Words:** Endoscopy, Biopsy, Histopathology, Upper gastrointestinal tract, Non-neoplastic lesions, Neoplastic lesions

## INTRODUCTION

Upper gastrointestinal tract disorders are one of the most commonly encountered problems in clinical practice with a high degree of morbidity and mortality. Endoscopic biopsy is the common procedure performed in hospitals for varieties of benign & malignant lesions.

Oesophagus and stomach can be sited for a wide variety of infections, inflammatory disorders, vascular diseases, mechanical conditions, toxic and physical reactions including radiation injury and neoplasm.

Histopathological study of the biopsy specimen is used to confirm the endoscopic diagnosis in suspected malignancies

/to rule out malignancy in the endoscopically appearing benign lesion.

Endoscopic biopsies are also used for monitoring the course, to determine the extent of the disease, response to therapy and early detection of complications.<sup>2</sup>

## AIMS AND OBJECTIVES

To determine the spectrum of histopathological lesions of the upper gastrointestinal tract.

To establish endoscopic biopsy as an effective tool in the proper diagnosis of various upper gastrointestinal tract lesions.

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## MATERIAL & METHODS

The present study included 212 endoscopic biopsies of the upper gastrointestinal tract. They were taken from patients who were clinically diagnosed to have upper gastrointestinal tract lesions at the department of gastro medicine at Smt. NHL MMC and Sheth VS general hospital from Sep 2018-Feb 2020.

The endoscopic equipment used for endoscopy & biopsy was OLYMPUS CF-H170L/I. Key benefits of this instrument are HDTV image quality, narrow-band imaging (NBI), close focus, variable stiffness, water jet and waterproof connector.

The biopsy specimen was put in saline and placed in filter paper with mucosal surface upwards. The filter paper was immersed in 10% formalin for fixation then the tissue was routinely processed and embedded in paraffin. 5 micron thick sections were cut perpendicular to the mucosal surface. 4-5 sections were prepared on each slide. Each section was stained with H&E and studied microscopically and the attempt was made to diagnose the lesion on gross visualization during endoscopy and to correlate them histopathologically. Special stain Giemsa stain was used to look for H. Pylori infection. Alcian blue (at pH 2.5) & PAS stain was used to detect acid mucin in true goblet cells in Barrett's oesophagus.

## RESULTS

As cited in table 1 out of a total of 212 GI endoscopic biopsies, 125 (58.96%) were from males and 87 (41.03%) were from females with M: F ratio being 1.4:1. Age of patients ranged between 16-72 years with the majority of patients being in the age group between 40-60 years (57.5%) and 2nd most common age group is 20-40 (32.08%) years followed by >60 years (8.9%) and <20 years (1.41%).

The site-wise distribution of endoscopic biopsies were duodenum 76 (35.85%), esophagus 70 (33.02%) and stomach 66 (31.13%) cases (Table 2). The most common site was the duodenum followed by the oesophagus and stomach.

As cited in table 3 out of 70 cases of oesophageal biopsies, there were 48 neoplastic lesions and 22 non-neoplastic lesions. Squamous cell carcinoma was the most common neoplastic lesion with 40 cases. The majority of oesophageal squamous cell carcinoma were moderately differentiated with 31 (77.5%) cases followed by poorly differentiated with 4 cases, basaloid pattern with 3 cases and 1 case of well-differentiated and spindle cell sarcomatoid carcinoma of each. Chronic active esophagitis was the most common non-neoplastic lesion. There were 3 cases of Barrett's oesophagus & 2 cases of eosinophilic esophagitis.

In gastric biopsies, non-neoplastic lesions were more than neoplastic lesions. The most common non-neoplastic lesion

was chronic gastritis with 25 (52.08%) cases. There were 13 cases of gastric ulcer, 5 cases of chronic superficial gastritis, 3 cases of polyp and 1 case each of H. Pylori gastritis and tuberculous inflammation. Adenocarcinoma was the most common malignant lesion with 18 cases. Concerning differentiation, cases of moderately differentiated carcinoma were more common followed by signet ring adenocarcinoma and poorly differentiated adenocarcinoma.

The most common site for biopsy was duodenum 76 cases (35.85%). The majority of cases were non-neoplastic 74 (97%). Among non-neoplastic lesions, chronic nonspecific Duodenitis was the most common with 57 cases (77.03%), followed by 3 cases of celiac sprue and Lymphangiectasiae each, 2 cases of Crohn's disease and 1 case of Strongyloides stercoralis.

## DISCUSSION

Upper gastrointestinal tract endoscopy is the investigation of choice in patients with Upper Gastrointestinal tract disorders. The present study was conducted on 212 cases of Upper Gastrointestinal tract endoscopies.

In the present study majority of the upper gastrointestinal tract, biopsies were from the duodenum (35.85%) followed by the oesophagus (33.02%) and stomach (31.13%). The majority of patients were in the age group of 4<sup>th</sup> to 6<sup>th</sup> decade of life. These findings are comparable to findings of studies by Krishnappa R et al.<sup>3</sup> and Katiyar V et al.<sup>19</sup>

In present study majority of the patients were males with an M: F ratio of 1.4 to 1. These results are almost comparable to study by Hussain et al.<sup>8</sup>, Abilash SC et al.<sup>13</sup>, Shanmugaswamy et al.<sup>14</sup>, Sheikh BA et al.<sup>15</sup> and Gulia et al.<sup>16</sup>, Katiyar V et al.<sup>19</sup>, Krishnappa R et al.<sup>3</sup>, Sheikh BA et al.<sup>24</sup>, Panjeta S et al.<sup>22</sup> & Shennak MM et al.<sup>18</sup>

Duodenal lesions: In our study majority of cases were from the duodenum (76) with duodenal biopsies involving the first two parts of the duodenum revealing non-neoplastic lesions (74) 97.36% more than neoplastic lesions (2) 2.63%. This observation is comparable to studies conducted by Sheikh BA et al.<sup>15</sup> & Krishnappa R et al.<sup>3</sup> Among non-neoplastic lesions chronic nonspecific duodenitis was the leading diagnosis which is comparable with the study by Khadunge et al.<sup>17</sup> This may be because the duodenum has rapidly regenerated epithelial lining which can be easily affected by any inflammatory insult. Among malignant lesions, both were found to be adenocarcinoma which is comparable with findings of the study conducted by Sheikh BA et al.<sup>15</sup> which also shows adenocarcinoma is the most common malignancy of duodenum.

Oesophageal lesions: In the present study out of 70 cases with oesophageal lesions, 68.57% were neoplastic lesions and 31.42% were non-neoplastic lesions. These findings are

comparable to study conducted by Bukhari U et al.<sup>20</sup> In neoplastic lesions the most common carcinoma was squamous cell carcinoma with 40 cases(83.33%) which is comparable with the study by Abilash SC et al.<sup>13</sup>, Shanmugasamy et al.<sup>14</sup>, Bukhari U et al.<sup>20</sup>, Krishnappa R et al.<sup>3</sup>, and Khan N A et al.<sup>21</sup> followed by adenocarcinoma with 1 case. Most patients with oesophageal carcinoma were found between 4<sup>th</sup>-6<sup>th</sup> decades of life which is comparable to study by Krishnappa R et al.<sup>3</sup>, Panjeta S et al.<sup>22</sup>, Khan N A et al.<sup>21</sup>, Khandige et al.<sup>17</sup> and Guliaet al.<sup>16</sup> The overall late age of presentation of oesophageal cancer can be due to absence of serosa and distensibility of the oesophagus which delays the symptoms of oesophageal cancer until the tumour is advanced. Oesophageal malignancy shows a male preponderance with M: F ratio being 2:1 which is comparable to a study by Krishnappa R et al.<sup>18</sup> In our study majority of neoplastic lesions were seen arising from the middle oesophagus 77.5% which suggest the middle oesophagus was the commonest site followed by the lower oesophagus 22.5%, these results were comparable to study by Krishnappa R et al.<sup>3</sup>, Katiyar et al.<sup>19</sup> and Abhilashet al.<sup>13</sup> Squamous cell carcinoma of the oesophagus endoscopically presented as ulcer proliferative growth in (37.5%)15 cases, ulcerated in(25%) 10 cases, ulcer infiltrative in (17.5%)7 cases, stenosing in (12.5%) 5 cases and proliferative in (7.5%) 3 cases. Among-neoplastic lesions eosinophilic esophagitis endoscopically presented as the feminization of the oesophagus. On microscopic appearance, there were 16 eosinophils/HPF.

Stomach lesions: Among 66 cases of gastric biopsies 72.7% (48)cases were non-neoplastic and 27. 2%(18) cases were neoplastic. The higher number of non-neoplastic lesions these findings are comparable to studies by Thapa R et al.<sup>23</sup>, Sheikh BA et al.<sup>15</sup> and Krishnappa R et al.<sup>3</sup> The most common non-neoplastic lesion was chronic non-specific gastritis with(52.08%) 25 cases followed by a gastric ulcer with 13 cases. Adenocarcinoma was the most common neoplastic lesion in our study with the major sub-site being the pyloric antrum of the stomach followed by the body of the stomach. These findings were comparable to study by Sheikh B A et al.<sup>15</sup> and Thapa R et al.<sup>23</sup> Majority of people having gastric malignancy were in the age group of 41-60 years which was similar to study by Khandige et al.<sup>17</sup> Majority of neoplastic lesions were found in male with M: F ratio being 1.3:1 which was comparable to study conducted by Thappa R et al.<sup>23</sup> and Krishnappa R et al.<sup>3</sup> Adenocarcinoma of stomach endoscopically presented as ulcerative growth 50%, ulceroproliferative growth 27.77%, proliferative growth 16.66% and ulcer infiltrative growth 5.55% comparable to study by Krishnappa R et al.<sup>3</sup>

## CONCLUSION

In our study duodenum was the most common site of upper gastrointestinal biopsy followed by the oesophagus and

stomach. Histologically diagnosed chronic nonspecific duodenitis was the most common lesion from the duodenum.

Squamous cell carcinoma was the most common malignancy histologically diagnosed from the oesophagus. Dysphagia was the common clinical presentation of Squamous cell carcinoma.

In the stomach chronic non-specific gastritis was the most common diagnosed non-neoplastic lesion.

Thus, Endoscopic biopsy permits diagnosis of a specific entity & act as a planning tool for surgical and medical therapy.

Upper gastrointestinal tract endoscopy is the effective and appropriate initial investigation to assess patients with Upper gastrointestinal tract symptoms. Histopathology is the gold standard for the diagnosis of endoscopically detected lesions.

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### Conflict of interest

There are no conflicts of interest.

### Author's contribution:

Dr. Shaikh Imran Y: Concepts, design, the definition of intellectual content, literature research, data analysis, statistical analysis,

Dr. Savalia Charmi H: data acquisition, manuscript preparation, manuscript editing

Dr. Gandhi Minesh B: manuscript review

Dr. Shah Cherry K: manuscript review

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**Table 1: Age and gender wise distribution**

Age	Male	Female	Total no of cases
0-20	02	01	03
>20-40	48	20	68
>40-60	65	57	122
>60	10	09	19
	125	87	212

Out of total of 212 GI endoscopic biopsies, 125(58.96%) were in males and 87 (41.03%) were in females with M: F ratio being 1.4:1. Age of patients ranged between 16-72 years with the majority of patients being in the age group between 40-60 years(57.5%) and 2nd most common age group is 20-40 (32.08%)years followed by >60years (8.9%) and <20 years (1.41%).

**Table 2: Site of Biopsy**

Site of Biopsy	No. of Cases
Esophagus	70
Stomach	66
Duodenum	76
Total	212

The site-wise distribution of endoscopic biopsies were duodenum 76 (35.85%), oesophagus 70 (33.02%) and stomach 66(31.13%) cases. The most common site was the duodenum followed by the esophagus and stomach.

**Table 3: Esophageal lesion**

Type of Lesion	No of Cases
Chronic active Esophagitis	16
Eosinophilic Esophagitis	02
Barret's esophagus	03
Well differentiated SCC	01
Moderately differentiated SCC	31
Poorly differentiated SCC	04
Basaloid SCC	03
Spindle cell sarcomatoid SCC	01
Poorly differentiated adenocarcinoma	01
Mild dysplasia	04
High-grade dysplasia	03
Negative for dysplasia	01
Total	70

Out of 70 cases of oesophageal biopsies, there were 48 neoplastic lesions and 22 non-neoplastic lesions. Squamous cell carcinoma was the most common neoplastic lesion with 40 cases. The majority of oesophageal squamous cell carcinoma were moderately differentiated with 31(77.5%) cases followed by poorly differentiated with 4 cases, basaloid pattern with 3 cases and 1 case of well-differentiated and spindle cell sarcomatoid carcinoma of each. Chronic active esophagitis was the most common non-neoplastic lesion. There were 3 cases of barret's oesophagus & 2 cases of eosinophilic esophagitis.

**Table 4: Stomach lesion**

Type of lesion	No of cases
Chronic gastritis	25
Chronic superficial gastritis	05
H.pylori gastritis	01
Gastric ulcer	13
Polyp	03
Moderately differentiated adenocarcinoma	08
Poorly differentiated adenocarcinoma	03
Signet ring adenocarcinoma	07
Tuberculous inflammation	01
Total	66

In gastric biopsies, non-neoplastic lesions were more than neoplastic lesions. The most common non-neoplastic lesion was chronic gastritis with 25 (52.08%) cases. There were 13 cases of gastric ulcer, 5 cases of chronic superficial gastritis, 3 cases of polyp and 1 case each of H. Pylori gastritis and tuberculous inflammation. Adenocarcinoma was the most common malignant lesion with 18 cases. Concerning differentiation, cases of moderately differentiated carcinoma were more common followed by signet ring adenocarcinoma and poorly differentiated adenocarcinoma.

**Table 5: Duodenal lesion**

Type of lesion	No of Cases
Chronic non specific duodenitis	57
Crohn's disease	02
Polyp	01
lymphangiectasia	03
Celiac sprue positive	03

**Table 5: (Continued)**

Type of lesion	No of Cases
Celiac sprue negative	08
Moderately differentiated adenocarcinoma	01
Strongyloidesstercoralis	01
Total	76

With 76 cases duodenum is the most common site for biopsy. The majority of cases were non-neoplastic (74). Among non-neoplastic lesions chronic non-specific Duodenitis was the most common with 57(77.03%) cases followed by 3 cases of celiac sprue and Lymphangiectasia each, 2 cases of Crohn's disease and 1 case of strongyloides stercoralis.

**Table 6: Comparison of size distribution of endoscopic biopsies with other studies.**

Study	Oesophagus	Stomach	Duodenum
Sheikh B A et al. (n=196)	25.5%	64.8%	2.04%
Krishnappa R et al. (n=100)	25%	68%	7%
Panjeta et al. (n=192)	6.25%	84.05%	3.64%
Shennak et al. (n=1605)	22%	69.8%	8.2%
Present study (n=212)	33.02%	31.13%	35.85%