Original Article

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Histopathological Study of The Upper Gastrointestinal Tract Endoscopic Biopsies

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ABSTRACT

Background: Patients presenting with gastrointestinal (GI) symptoms are very common in clinical practice. The advent of modern flexible endoscopes has made entry as well as visualization inside the upper GI tract easy, thereby facilitating the effective management of these patients. This study was conducted to determine the frequency as well as to study the spectrum of the histopathological lesions of upper GI tract. The clinical symptoms, endoscopic findings, and histopathological findings were also correlated.

Methods: This is a cross sectional study conducted in the Department of Pathology, in a tertiary care hospital, from July 2014 to June 2016. All the full mucosal thickness endoscopic biopsies, incorporating muscularis mucosae, of the upper GI tract were included in the study.

Results: The upper GI endoscopic biopsies constituted 0.93% of all surgical pathology specimens. Stomach was the most common biopsied site (55%), followed by esophagus (39%), and duodenum (6%). In esophagus, squamous cell carcinoma (82.60%) was more common as compared to adenocarcinoma (17.40%). Amongst gastric carcinoma, most common histological pattern noted was tubular adenocarcinoma (61.90%), followed by poorly cohesive carcinoma. All the duodenal biopsies showed chronic non-specific duodenitis. Overall, 91% concordance was noted between endoscopic and histopathological diagnosis.

Conclusions: Upper GI endoscopy is an effective and appropriate initial investigation to assess patients with upper GI symptoms. Histopathology is the gold standard for the diagnosis of endoscopically detected lesions.

Keywords: *Endoscopes, Histopathology, Upper GI Endoscopic Biopsies, Clinical Introduction*

Introduction

Endoscopy provides a unique opportunity to visualize the mucosal surface of the GI tract and examination by a qualified pathologist of specimens obtained at endoscopy is a routine and critical part of managing disorders of the alimentary tract.[1] Upper GI endoscopy in combination with biopsy plays an important role in the early diagnosis of GI neoplasms and provides an opportunity for a broad range of treatment options as well as potential for possible cure.[2]

This study was conducted to determine the frequency as well as to study the spectrum of the histopathological lesions of upper GI tract. The clinical symptoms, endoscopic findings, and histopathological findings were also correlated.

Methods

All the details of patients like age, sex, presenting symptoms, site of biopsy, and endoscopic findings were retrieved from the computer database of the hospital. Endoscopies were performed using a large channel flexible endoscope Pentax EG-2770K with EPK-i processor attached to SONY Television screen (monitor) and biopsies were taken by double-bite biopsy forceps equipped with a needle- spike. These biopsies were received in properly labeled and tightly closed container containing 10% formalin, which were then examined grossly for the number and appearance. After adequate fixation, entire biopsy was processed routinely and embedded in paraffin with mucosal surface uppermost. Five micron thick sections were cut perpendicular to this surface using rotary microtome and 3-4 serial sections were prepared on each slide. Sections were stained with routine Hematoxyline and Eosin stain, and mounted with cover slips using Distyrene Plasticizer Xylene (DPX) as mountant. Special stains were done wherever necessary like periodic-Schiff (PAS) and Gomori's methanamine silver (GMS) stain for fungus, reticulin stain to judge the degree of atrophy in gastric mucosa, and Giemsa stain for identification of organisms like Helicobacter pylori.

Results

The upper GI endoscopic biopsies constituted 0.93% of all surgical pathology specimens received during the period of study. Amongst all the biopsies received, maximum (55%) were from stomach, followed by esophagus (39%) and then, duodenum (6%). Though upper GI lesions are found in almost all the age groups, in the present study, it was seen that maximum biopsies (80%) were obtained from

persons in 5th to 7th decade of lives and males (72%) were more as compared to females (28%) in the present study.

Esophagus: Most of the biopsies were obtained from the lower end of esophagus (56.40%), followed by middle esophagus (35.90%), and upper esophagus (7.70%). Esophageal biopsies were most frequently received from the patients in 7th decade (38.50%) and 6th decade (30.80%) with male to female ratio (M:F) being 2:1. Majority of the patients presented with overlapping symptoms in which most common presentation was dysphagia, followed by loss of appetite, dyspepsia, vomiting, and then nausea, abdominal pain and weight loss. Neoplastic lesions (69.20%) were more commonly encountered in esophagus than non-neoplastic lesions (30.80%). Reflux esophagitis was most common amongst non-neoplastic lesions (6 out of 12 cases). Most of the malignancies were seen in the middle esophagus (47.80%), followed by lower end (43.50%) and rest being in upper end of esophagus (8.70%). The present study showed that malignancies are more common in sixth decade (39.10%), followed closely by seventh decade of life (34.80%) and M:F ratio was found to be 4.75:1. Squamous cell carcinoma (82.60%) is more common than adenocarcinoma (17.40%) in esophagus. Majority of the squamous cell carcinoma are seen in the middle esophagus (57.90%), followed by lower esophagus (31.60%), and then upper esophagus (10.50%). Mostly, squamous cell carcinoma was moderately differentiated (68.40%).

Stomach: Gastric biopsies were most frequently obtained in 5th decade (34.50%) with M:F ratio being 2.92:1. Majority of the patients with malignant lesions presented with the complaint of abdominal pain and loss of appetite. Most malignancies were found in the antrum and pylorus region of stomach (81%) with majority of patients in their 5th and 6th decades of lives. Males (76.20%) were predominantly affected (16 out of 21 cases). Amongst 21 cases of malignancies found, tubular adenocarcinoma was most common and found in 13 cases. 4 cases of signet ring cell carcinoma, 2 cases of papillary carcinoma and 1 case each of mucinous and undifferentiated carcinoma were seen. Tubular adenocarcinoma was mostly seen in antropyloric region and one of the tubular adenocarcinoma was seen superimposed with Candidial infection.

Duodenum: All the 6 duodenal biopsies showed chronic nonspecific duodenitis. No malignancy was seen in any case.

Table 1: presents the pattern of endoscopic findings seen in the upper GI tract.

Endoscopic findings	Number	Percentage
Erythema	36	36%
Ulcer	5	5%
White patch	2	2%
Whitish areas on reddened mucosa	1	1%
Multiple polyps	1	1%
Thickening	15	15%
Growth	40	40%
Total	**100**	**100%**

From the table 1, it is noted that the most common endoscopic finding was growth, followed closely by erythema.

Table 2: presents the pattern of histopathological lesions on endoscopic biopsies in upper GI biopsies (100 biopsies).

Pattern of histopathological lesions on endoscopic biopsies in upper GI biopsies (100 biopsies)	No. of cases	Percentage(%)	
ESOPHAGUS			
Normal esophagus	1	1%	Non-neoplastic(12%)
Reflux esophagitis	6	6%	
Eosinophilic esophagitis	1	1%	
Esophageal Candidiasis	1	1%	
Esophageal Ulcer	2	2%	
Barrett's Esophagus	1	1%	

Pattern of histopathological lesions on endoscopic biopsies in upper GI biopsies (100 biopsies)	No. of cases	Percentage(%)	
Low grade dysplasia-esophagus	2	2%	Neoplastic(27%)
High grade dysplasia-esophagus	2	2%	
Well differentiated Squamous cell carcinoma of esophagus	4	4%	
Moderately differentiated Squamous cell carcinoma of esophagus	13	13%	
Poorly differentiated Squamous cell carcinoma of esophagus	1	1%	
Basaloid Squamous cell carcinoma of esophagus	1	1%	
Well differentiated Adenocarcinoma of esophagus	2	2%	
Moderately differentiated Adenocarcinoma of esophagus	2	2%	
STOMACH			
Acute gastric ulcer	1	1%	Non-neoplastic(30%)
Chronic peptic ulcer	2	2%	
Chronic non-specific antral gastritis	12	12%	
Chronic active H. pylori gastritis, antrum predominant	5	5%	
Chronic atrophic gastritis	3	3%	
Chronic superficial gastritis	5	5%	
Gastric candidiasis	1	1%	
Fundic gland polyp	1	1%	
Low grade dysplasia-Antrum	1	1%	Neoplastic(25%)
High grade dysplasia-Antrum	3	3%	
Tubular adenocarcinoma	13	13%	
Papillary adenocarcinoma	2	2%	
Mucinous adenocarcinoma	1	1%	
Poorly cohesive (Signet ring cell carcinoma)	4	4%	
Undifferentiated carcinoma	1	1%	
DUODENUM			
Chronic non-specific duodenitis	6	6%	Non-neoplastic(6%)
Total biopsies	**100**	**100%**	

The above table shows that the spectrum of lesions from upper GI endoscopic biopsies varies from non- neoplastic to neoplastic, in which neoplastic lesions outnumbered the non- neoplastic lesions in esophagus while the reverse being true in stomach and duodenum.

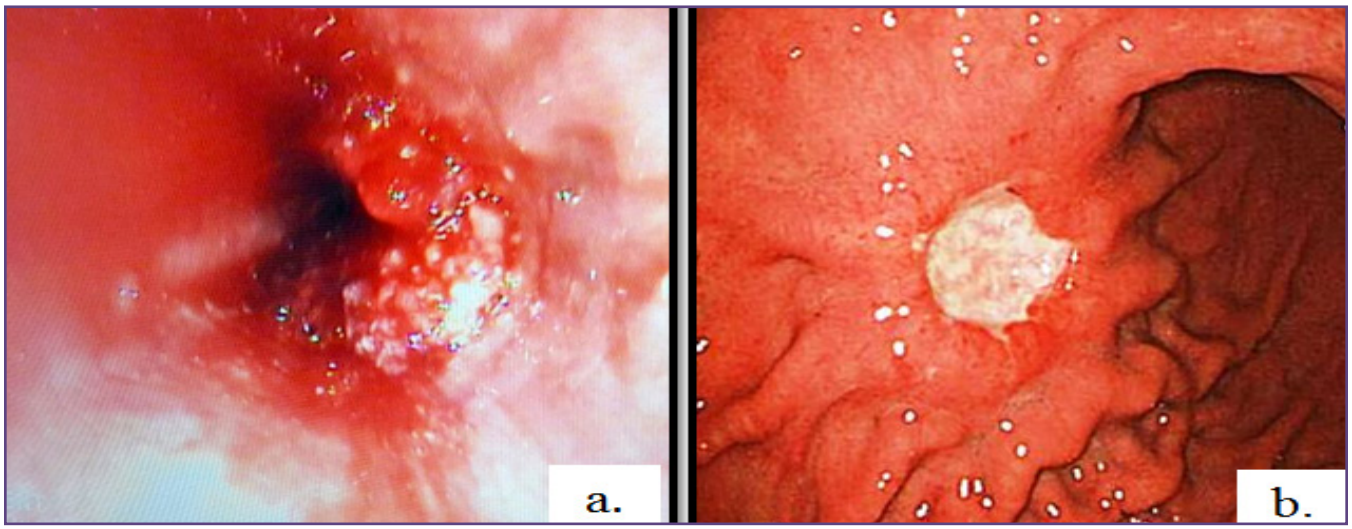

Fig. 1: (a. & b.). Endoscopic images in which figure 1a shows a fungating growth at the lower end of esophagus and figure 1b shows a sharp punched out ulcer in the stomach.

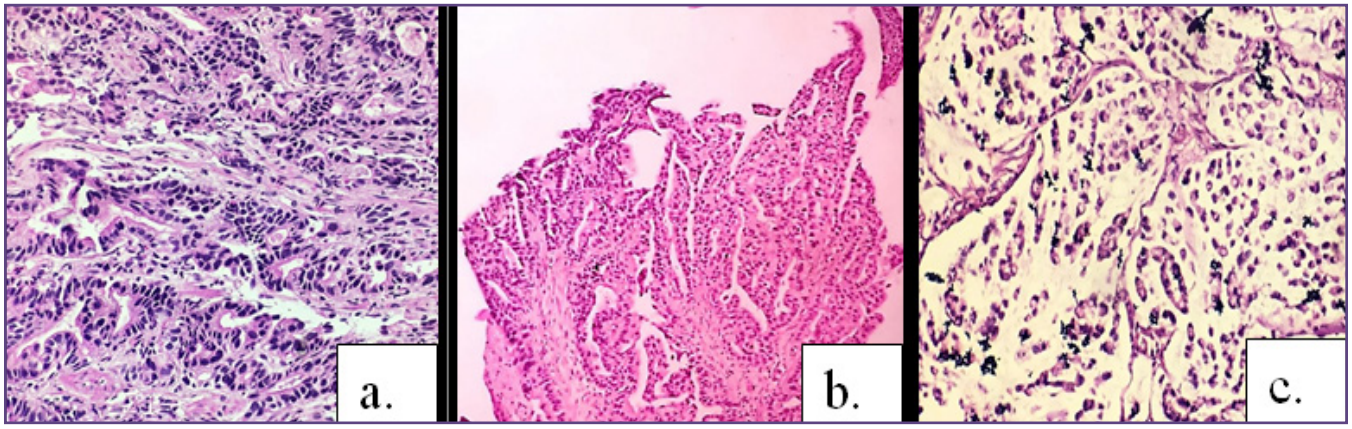

Fig. 2: (a,b,&c). Tubular(a), papillary(b), and mucinous(c) adenocarcinoma of stomach.(H&E stain)10X.

Discussion

In the present study, it is evident that majority of the upper GI endoscopic biopsies were from stomach, which is comparable with the studies reported by Rashmi et al[3], Memon et al[4], and Abilash SC et al.[5]

Overall, older patients underwent endoscopic biopsies as compared to young, majority were in the age group of 5th-7th decade of life in the present study. The results are almost comparable to the study by Rashmi et al[3], Abilash SC et al[5], and Shanmugaswamy et al[6]. This may be due to the possibility of malignancy which increases with age, and even the slightest suspicious area on endoscopy in elderly patients warrants the histopathological analysis.

In the present study most of the patients were males with M:F ratio of 2.57:1. These findings are closest to the study by Hussain et al[7]. Similarly, Gulia et al[2], Rashmi et al[3], Sheikh et al[8], Abilash SC et al[5], and Shanmugaswamy et al[6] also reported the gender ratio favoring the males. This may be reflective of the fact that males are exposed to more risk factors than females or due to overall large number of male patients attending outpatient department of the hospital as compared to female patients.

Overall, 91% concordance was noted between endoscopic and histopathological diagnosis, in which 34 out of 39 cases correlated in esophagus, 51 out of 55 cases in stomach and all 6 cases correlated in duodenum.

Esophagus: In the present study, majority of the malignancies were seen arising in the middle esophagus (47.83%), followed by lower esophagus (43.48%), and then, upper esophagus (8.69%). The results were comparable to the study by Khuroo et al[9], Rashmi et al[3], and Abilash SC et al[5]. The fact that we received overall maximum number of biopsies from lower end of esophagus (56.40%) reflects slightly higher frequency of malignancy in lower esophagus in this study as compared to others.

Most patients with esophageal carcinoma were found to be in the 6th-7th decades of lives. The other studies by Gulia et al[2], and Khandige et al[10] showed slightly early presentation of esophageal malignancy in the 5th-6th decade. The overall late age of presentation of esophageal cancer can be due to absence of serosa and the distensibility of the esophagus, which delays the symptoms of esophageal cancer until the tumor is advanced. Also, most patients in our environment are diagnosed at a late stage because of lack of awareness and accessibility to health care facilities.

Males (82.61%) were predominantly affected in esophageal malignancies. This male predominance is also seen in the study by Mchembe et al[11]. The male predominance may be due to the fact that most of the known risk factors for esophageal cancer are related to habits such as - smoking and excessive alcohol consumption - of which men in the society under study are known to consume more than women. In the present study, 65.21% cases of esophageal malignancies elicited the habit of alcohol consumption, and 56.52% cases gave history of smoking.

The present study showed the most common histological type of malignancy in esophagus to be squamous cell carcinoma. The same results were seen in the study by Rashmi et al[3], Mchembe et al[11], Abilash SC et al[5] and Shanmugaswamy et al[6].

Our study shows higher frequency of adenocarcinoma (17.40%) as compared to the previous study by Rashmi et al[3], Abilash SC et al[5] and Shanmugaswamy et al[6]. Mchembe et al[11] found 4% cases of adenocarcinoma. This higher frequency of adenocarcinoma in our study may be due to maximum number of biopsies of esophagus received from the lower end (56.40%), where adenocarcinoma is more common. The rising trend of incidence of adenocarcinoma is already being observed in western countries. Due to changing lifestyles in Indian

population, like increased alcohol consumption and smoking, recent studies also show an upward trend in the incidence of adenocarcinoma even in our country. Similar observation is reflected in the present study.

Stomach: Non-neoplastic lesions are more common than neoplastic lesions in stomach. Slightly higher percentage of neoplastic lesions were noted by Sheikh et al[8]. In the present study, lower percentage of non-neoplastic lesions may be due to tendency of offering symptomatic treatment in obvious non-neoplastic lesions and availability of commercial rapid urease test kits for Helicobacter pylori detection in our institute.

We got 25 cases of chronic gastritis from 55 gastric biopsies, of which superficial inflammation was seen in 5 cases (9.09%) which is comparable with the study by Thapa et al 2013[12]. Among the non-neoplastic lesions (30 cases), highest number of cases in gastritis fell under the group of chronic non-specific gastritis accounting for 40% cases. Similar observation was made by Rashmi et al[3] (37% cases) while Jawalkar et al[13] reported a higher number (65.22% cases).

Majority of the gastric malignancies arise in the antrum and pylorus region of stomach. Similarly, higher involvement of antrum and pylorus by gastric malignancies was seen in the study by Rashmi et al[3] and Sheikh et al[8].

Majority of the people having gastric malignancy were in the age group of 41-60 years, which is similar to the study by Khandige et al[10] and Mabula et al[14].

Males were predominantly affected in gastric malignancies with M:F ratio of 3.2:1. Similar male predominance was seen in the study by Khuroo et al[9], Mabula et al[14], and Sheikh et al[8].

Majority of the patients with gastric malignancy presented with complaint of abdominal pain and loss of appetite.

On endoscopy, 21 histologically confirmed cases of malignancy were reported either as growth (66.67%) and thickening of mucosa (33.33%) in stomach. Rashmi et al[3] reported 90% cases with growth as endoscopic finding in malignant cases.

In the present study, most common histological type of gastric malignancy was tubular adenocarcinoma which was seen in 13 cases (61.90%) out of 21 cases, followed by Signet ring cell carcinoma (19.04%). Lazar et al[15] and K C Shiva Raj et al[16] also found tubular adenocarcinoma as most common histological type.

Duodenum: In the present study, all 6 cases (100%) of duodenal biopsies showed chronic non-specific duodenitis. This was similar to the study of Khandige et al[10]. This may be due to the fact that duodenum has a rich rapidly regenerating epithelial lining which can easily be affected by any inflammatory insult.[4]

Conclusions

Histopathology is the gold standard for the diagnosis of endoscopically detected lesions and endoscopy is incomplete without biopsy.

Conflict of interest

There are no conflict of interest.

Ethical committee approval

This study has been approved by the institutional ethical committee.

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References

1. Odze RD, Goldblum JR. Odze and Goldblum SURGICAL PATHOLOGY of the GI Tract, Liver, Biliary Tract, and Pancreas. 3rd ed. Odze RD, Goldblum JR, editors. China: Saunders, Elsevier; 2015. 4-845 p.
2. Gulia, Chaudhury SP, Noorunnisa MN, Balakrishnan C D, Balagurunathan K. Interpretation of Upper GastroIntestinal Tract Endoscopic Mucosal Biopsies – A Study Conducted In Teaching Hospital In Puducherry, India. Int J Med Heal Sci J. 2012;1(3):17–24.
3. Rashmi K, Karar A, Mangala G. A study on histopathological spectrum of upper gastrointestinal tract endoscopic biopsies. Int J Med Res Heal Sci. 2013;2(3):418–24.
4. Memon F, Baloch K, Memon AA. Upper Gastrointestinal Endoscopic Biopsy; Morphological Spectrum of Lesions. Prof Med J. 2015;22(12):1574–9.
5. Abilash S, Kolakkadan H, MM G, Shreelakshmidevi, S Balamuruganvelu S. Histopathologic Spectrum of Upper Gastrointestinal Tract Mucosal Biopsies: A Retrospective Study. Sch J Appl Med Sci [Internet]. 2016;4(5E):1807–13.
6. Shanmugasamy K, Bhavani K, K AV, Narashiman R, Kotasthane DS. Clinical Correlation of Upper Gastrointestinal Endoscopic Biopsies with Histopathological Findings and To Study the Histopathological Profile of Various Neoplastic and Non-Neoplastic Lesions. 2016;(April).

7. Hussain SI, Reshi R, Akhter G, Beigh A. Clinico histopathological study of upper gastrointestinal tract endoscopic biopsies. IJCRR. 2015;7(16):78–85.
8. Sheikh BA, Hamdani SM, Malik R. Spectrum of Neoplastic Lesions of Upper Gastrointestinal Tract – a Study of Endoscopic. Glob J Med public Heal. 2015;4(4):1–8.
9. Khuroo MS, Zargar SA, Mahajan R, Banday MA. High incidence of oesophageal and gastric cancer in Kashmir in a population with special personal and dietary habits. Gut. 1992;33:11–5.
10. Khandige S, Shetty S, Thapa R. The conceding of upper gastrointestinal lesion endoscopic biopsy : a bare minimum for diagnosis. Int J Sci Res. 2015;4(2):264–6.
11. Mchembe MD, Rambau PF, Chalya PL, Jaka H, Koy M, Mahalu W. Endoscopic and clinicopathological patterns of esophageal cancer in Tanzania: experiences from two tertiary health institutions. World J Surg Oncol. 2013;11:257.
12. Thapa R, Lakhey M, Yadav PK, Kandel P, Aryal C, Subba K. Histopathological study of endoscopic biopsies. J Nepal Med Assoc. 2013;52(6):354–6.
13. Jawalkar S, Arakeri SU. Role of Endoscopic Biopsy in Upper Gastrointestinal Diseases. Res J Pharm Biol Chem Sci. 2015;6(4):977–83.
14. Mabula JB, Mchembe MD, Koy M, Chalya PL, Massaga F, Rambau PF, et al. Gastric cancer at a university teaching hospital in northwestern Tanzania: a retrospective review of 232 cases. World J Surg Oncol 2012;10:257.
15. Lazăr D, Tăban S, Sporea I, Dema A, Cornianu M, Lazăr E, et al. Gastric cancer: correlation between clinicopathological factors and survival of patients (II). Rom J Morphol Embryol. 2009;50(2):185–94.
16. Shiva Raj K, Amatya G, Lakhey A, Basnet S, Aryal G. Incidence of gastric cancer, its subtypes, and correlation with Helicobacter Pylori. J Pathol Nepal. 2013;3(5):403–7.

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