Original Article

Histopathological spectrum of upper gastrointestinal endoscopic biopsies

S Hirachand[1], RR Sthapit[2], P Gurung[1], S Pradhanang[1], R Thapa[1], M Sedhai[1], S Regmi[1]

[1]Department of Pathology, Kathmandu Medical College and Teaching Hospital, Kathmandu, Nepal

[2]Department of Surgery, Bir Hospital, Kathmandu, Nepal

Abstract

Background: Upper gastrointestinal tract disorders are one of the most commonly encountered problems in the clinical practice. A variety of disorders can affect the upper gastrointestinal tract. Endoscopy, in combination with biopsy, plays an important role in the exact diagnosis for further management.

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

Methods: A prospective study was conducted in the Department of Pathology, Kathmandu Medical College and Teaching Hospital, Nepal from January 2015 to December 2016 (2 years).

Results: A total 243 endoscopic biopsies were evaluated. Out of which, 219 cases were from gastric, 15 were from esophagus and 9 were from duodenum. Among the gastric biopsies, 77 cases (35.16%) were chronic active gastritis and 27 cases (12.33%) were malignant. The most common malignancy was adenocarcinoma. Among the 15 oesophageal biopsies, 12 cases (80%) were of non-neoplastic and 3 cases (20%) were of neoplastic nature. The most common malignancy was squamous cell carcinoma. Among 9 cases of duodenum biopsies, all were non-neoplastic, of which chronic non-specific duodenitis (66.66%) was the commonest.

Conclusion: Endoscopy is incomplete without histopathological examination of biopsy and so, the combinations of methods play an important role in diagnosis and management of upper gastrointestinal tract disorders.

Address for correspondence
Dr. Suspana Hirachand, MD
Associate Professor
Department of Pathology,
Kathmandu Medical College and Teaching Hospital
Kathmandu, Nepal
E-mail: suspi1974@hotmail.com

Keywords: Endoscopic biopsy, histopathology, Non-neoplastic and neoplastic lesions of upper gastrointestinal tract.

Introduction

Upper gastrointestinal tract (GIT) disorders are one of the most commonly encountered problems in the clinical practice with a high degree of morbidity and mortality and endoscopic biopsy is common procedure performed in the hospital for a variety of benign and malignant lesions.[1]

The upper gastrointestinal flexible fiber optic endoscopy was first used in 1968 and proved to be a major breakthrough in the diagnosis of gastrointestinal tract lesions.[2] There is a wide range of pathologic lesions which may affect upper GIT like: infectious diseases, inflammatory disorder, mechanical, toxic and physical reactions including radiation injury and neoplasm.[3] Upper gastrointestinal endoscopy in combination with biopsy play an important role in the early diagnosis of gastrointestinal lesions.[4]

Endoscopic biopsy examination followed by histologic assessment is a convenient procedure and current gold standard for accurate objective assessment of patients with symptoms of upper GIT. It is not only used to diagnose malignant and inflammatory lesions but also for monitoring the course, extent of disease, response of the therapy and early detection of complications. This is reflected by a rising trend in obtaining mucosal biopsies from upper GIT.[5]

This study was undertaken to determine the spectrum of histopathological lesions of upper gastrointestinal tract.

Methods

This prospective study was conducted in the Department of Pathology, Kathmandu Medical College and Teaching Hospital, Nepal from January 2015 to December 2016 (2 years). A total 243 endoscopic biopsies were evaluated. All the biopsy samples were fixed in 10% formalin, followed by conventional tissue processing and embedding. Five micron thick sections were cut and slides were prepared. Each section were stained with Haematoxylin and Eosin and studied. Additional sections were stained with Giemsa to observe H. Pylori and Periodic Acid Schiff (PAS) stain were performed wherever necessary. Grading for gastric and duodenal biopsies was done according to updated revised Sydney and modified marsh classification. All tumors were classified according to the WHO classification.

Results

In this present study, out of 243 cases, 138 (56.8%) were males and 105 (43.2%) were females with male to female ratio of 1.76:1. The mean age of presentation was 52 years. The youngest patient was 16 year male with chronic active gastritis and the oldest patients was 84 years male with poorly differentiated adenocarcinoma.

The results of site distribution of upper GI biopsies shown in **(Figure 1).** Among the 243 endoscopic biopsies, gastric biopsies constituted of higher incidence (219 cases-90.12%).

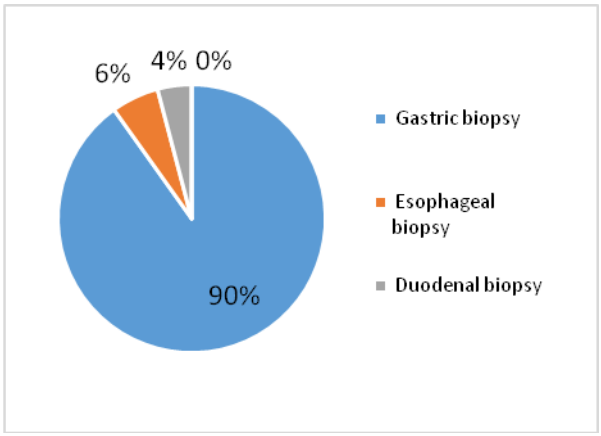

Figure 1: Site distribution of upper GI biopsies

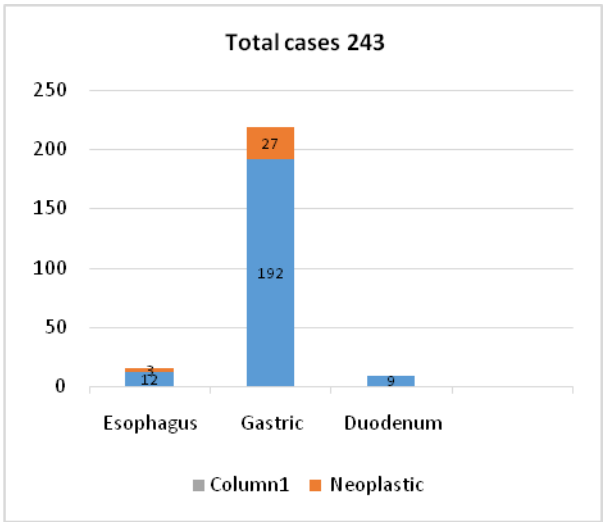

Figure 2: Histopathological spectrum of upper GI lesions

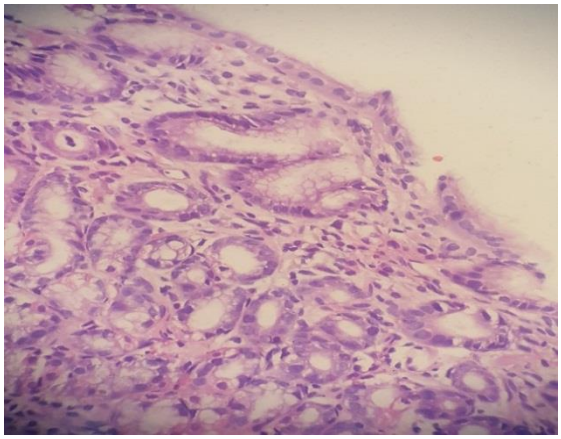

Figure 3: Chronic Gastritis (H&E, 40X)

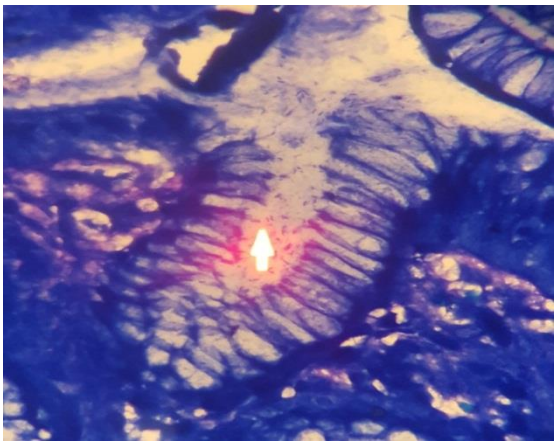

Figure 4: Helicobacter pylori (Giemsa stain, 100X)

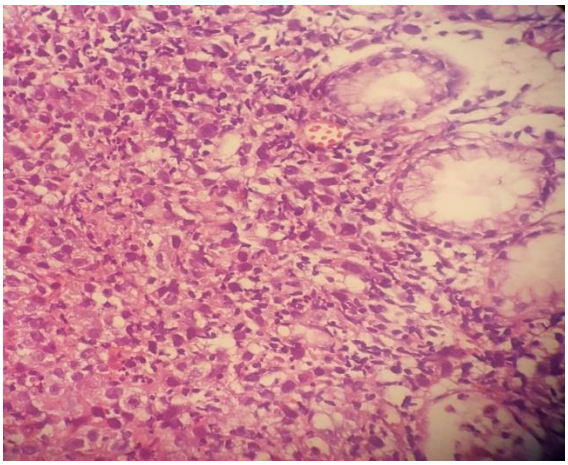

Figure 5: Poorly differentiated adenocarcinoma, stomach (H&E, 40X)

Table 1: Histopathological findings in esophageal biopsies

Lesions	No. of cases	Percentage (%)
Chronic non-specific esophagitis	8	53.33 %
Benign esophageal ulcer	3	20.00 %
Barret's esophagus	1	6.67 %
Squamous cell carcinoma	3	20.00 %
Total	15	100 %

Table 2: Histopathological findings in gastric biopsies

Lesions	No. of cases	Percentage (%)
Chronic active gastritis with H. Pylori positive	66	30.14%
Chronic active gastritis with H. Pylori negative	20	9.13%
Chronic gastritis with H. Pylori positive	41	18.72%
Chronic gastritis with H. Pylori negative	36	16.44%
Chronic gastritis with H. pylori positive and intestinal metaplasia	10	4.57%
Benign gastric ulcer	8	3.65%
Polyps	11	5.02%
Gastric adenocarcinoma	27	12.33%
Total	219	100%

Table 3: Histopathological findings in duodenal biopsies

Lesions	No. of cases	Percentage (%)
Chronic non-specific duodenitis	6	66.67%
Benign ulcer	2	22.22%
Inflammatory polyp	1	11.11%
Total	9	100%

Table 4: Site wise distribution of endoscopic biopsies in different studies

Sites	Jaynul Islam SM et al. (9)	Sandhya PG et al. (4)	Memon F et al. (3)	Krishnappa R et al. (5)	Present study
Stomach	66.36%	84.85%	51.3%	68%	90.12%
Esophagus	20.00%	6.25%	39.0%	25%	5.76%
Duodenum	13.64%	5.62%	9.7%	7%	4.12%

Table 5. Comparison of non-neoplastic and neoplastic lesions in esophageal biopsies in different studies

Esophageal Biopsies	Krishnappa R et al. (5)	Abilash SC et al. (10)	Sandhya PG et al. (4)	Present study
Non-neoplastic	56%	52.26%	83.33%	80%
Neoplastic	44%	47.74%	16.67%	20%

Table 6. Gastric adenocarcinoma in different studies

Gastric Biopsies	Jaynul Islam SM et al. (9)	Jeshtadi A et al. (12)	Sandhya PG et al. (4)	Abilash SC et al. (10)	Memon F et al. (3)	Present study
Gastric Adenocarcinoma	45.20%	43.67%	6.58%	14.70%	4.9%	12.33%

On histology assessment, the total numbers of diagnosed malignant cases were 30, of which 27 (90%) cases were gastric and 3 (10%) cases were esophageal. Duodenal malignancy was not seen in our study **(Figure 2)**.

Among 15 cases of esophageal biopsies, 12 cases were of non-neoplastic and 3 cases were of neoplastic nature **(Table: 1)**. Out of 219 cases of gastric biopsies, 192 were non-neoplastic and 27 were neoplastic cases. Among the 192 non-neoplastic cases, majority of were chronic active gastritis (77 cases- 35.16%). Eleven cases were polyps, of which 7 were hyperplastic polyps, 2 were fundic gland polyps and 2 were inflammatory polyps **(Table: 2)**. Out of 27 (12.33%) malignant cases, site wise distribution revealed 20 cases from pyloric antrum (74.08%) followed by 4 cases from cardia (14.81%) and 3 cases from corpus (11.11%). All the 27 neoplastic cases were histologically diagnosed as adeno-carcinoma, out of which, 8 were well differentiated adenocarcinoma, 12 were moderately differentiated adenocarcinoma and 7 were poorly differentiated adenocarcinoma **(Figure 5)**.

Among 9 cases of duodenum biopsies, all were non-neoplastic, of which chronic non-specific duodenitis (6 cases- 66.66%) was the commonest **(Table: 3)**.

Discussion

According to National Cancer Registry, gastric and esophageal cancers are the most common cancers found in men, while esophageal cancer ranks third among women after breast and cervical cancers.[6] Hence, there is a need to detect these malignant lesions at an early stage and

differentiate them from the various benign and inflammatory conditions that afflict the upper GI tract and may give rise to an overlapping symptomatology.

Histopathological study of endoscopic biopsy specimens is used to confirm the endoscopic diagnosis in case of suspected malignancy or to make the diagnosis of a benign condition, thus allowing an early therapeutic decision without unnecessary delay.[7]

In the present study, among 243 upper gastrointestinal tracts endoscopic biopsies male to female ratio was 1.76:1. Male predominance was also observed in other studies done by Sandhya PG et al.,[4] Krishnappa R et al.[5] and Shennak MM et al.[8] The gender ratio favoring males could be reflective of fact that males are exposed to more risk factors than female and gastrointestinal malignancies are more common in male. Most of the biopsies were from forth to fifth decade. The youngest patient was 16 years old and the oldest patient was 84 years old. The age related difference could be due to varied exposure to the risk factors among the different age groups, especially in relation to dietary habits of both qualitative and quantitative.

The most common site for upper gastrointestinal endoscopic biopsy is from the stomach, followed by esophagus and duodenum, which is concordant with the similar studies shown in **Table: 4.** Among the 15 esophageal biopsies, non-neoplastic lesions (80%) were more common than neoplastic lesions (20%). These results are comparable with similar studies as shown in **Table: 5.** Majority of cases were inflammatory or benign in nature and chronic non-specific esophagitis (53.33%) was the commonest diagnosis. All neoplastic cases (20%) were squamous cell carcinoma, similar to studies done by Krishnappa R et al.[5], Abilash SC et al.[10] and Sheikh BA et al.[11]

In our study, gastric biopsies constituted the majority of cases (90.12%). Out of total 219 cases, 192 (87.67%) were non-neoplastic lesions whereas 27 (12.33%) were malignant lesions. The most common non-neoplastic lesions observed were chronic active gastritis 77 (35.16%), which correlated histologically with presence of neutrophils and lymphocytes in the lamina propria. H. pylori was positive in 66 (30.14%) **(Figure 4)** cases out of 77 (35.16%) cases of chronic active gastritis. H. pylori negative chronic active gastritis cases could be due to intake of proton pump inhibitors prior to endoscopic biopsy or failure to see H. pylori in the tissue specimens. Similar findings were observed in studies done by Shultz M et al. and Thapa R et al.[13,14] Twenty seven cases of gastric malignancies were diagnosed on

histopathology as gastric adenocarcinoma in line with other studies **(Table: 6)**. The common site of involvement was antrum of the stomach similar as in the other studies.[15-17]

With respect to differentiation of adenocarcinoma, moderately differentiated adenocarcinoma was more common than the well differentiated carcinoma, which was also in concordance with other studies.[18,19,20] Alcohol consumption, dietary factors, smoking and social habits have been proposed as risk factors for gastric cancer.[21]

There were only nine cases of duodenal biopsies in our study and all were non-neoplastic lesions. The commonest lesions being chronic non-specific duodenitis 6 (66.67%), similar to studies done by Abilash SC et al.,[10] Hussain et al.[22] and Neil A Shepherd et al.[23]

Conclusion

A variety of non-neoplastic and neoplastic lesions were reported in the present study across a wide range of age and site distribution. The commonest site of upper gastrointestinal lesions was stomach. The commonest non-neoplastic lesion was chronic active gastritis (35.16%) and neoplastic lesion was adenocarcinoma (12.33%). Endoscopy with combination of histopathological examination of biopsy plays an important role in early detection of lesions and further management.

References

1. Rosai J. In: Rosai and Ackerman's surgical Pathology. 9th ed. St. Louis: Mosby; 2004. p. 648-11.
2. Black stone MO. Endoscopic interpretation normal and pathologic appearance of the gastrointestinal tract. Raven Press New York 1984; 1: 13-15.
3. Memon F, Baloch K, Memon AA. Upper gastrointestinal endoscopic biopsy; morphological spectrum of lesions. Professional Med J 2015; 22(12): 1574-79.
4. Sandhya PG, Madhusudan C, Naseem N, Balkrishnan CD, Balagurunathan K. Interpretation of upper gastrointestinal tract endoscopic mucosal biopsies- A study conducted in teaching hospital in Punducherry, India. International Journal of Medical and Health Sciences 2012; 1(3): 17-24.
5. Krishnappa R, Horakerappa MS, Mangala Ali Karar, GouriMangala. A study on histopathologic spectrum of upper gastrointestinal tract endoscopic biopsies. Int J Medical Res Health Sciences 2013; 2(3): 418-24.
6. National cancer Registry Programme. First All India Report 2001-2002. Vol.1. Indian Council of Medical Research Bangalore, India. April 2004.
7. Winawer SJ, Sherlock P, Hadju SI. Role of upper gastrointestinal endoscopy in cancer patients. Cancer 1976; 37: 440.
8. Shennak MM, Tarawneh MS, Al Sheik. Upper gastrointestinal diseases in symptomatic Jordanians: A prospective

study. Ann Saudi Med 1997; 17(4): 471-74.

9. Jaynul Islam SM, Mostaque Ahmed ASM, Uddin Ahamad MS, Hafiz SAMMA. Endoscopic and histologic diagnosis of upper gastrointestinal lesions, experience in a Port City of Bangladesh. ChattagramMaa-o-Shishu Hospital Medical College Journal 2014; 13(3):11-4.
10. Abilash SC, Hasaf K, Gitanjali MM, Shreelaxmidevi S, Balamuruganvelu S. Histopathologic spectrum of upper gastrointestinal tract mucosal biopsies: A retrospective study. Sch. J. App. Med. Sci. 2016; 4(5): 1807-13.
11. Sheikh BA, Hamdani SM, Malik R. Histopathological spectrum of lesions of upper gastrointestinal tract- A study of endoscopic biopsies. Global Journal of Medicine and Public Health 2015; 4(4): 1-8.
12. Jeshtadi A, Mohammad AM, Kadaru MR, Nagamuthu EA, Kalangi H, Boddu A, Lakkarasu SK, Boila A. Study of gastric biopsies with clinicopathological correlation- A tertiary care centre experience. J. Evid. Based Med. Health 2016; 3(57): 2937-40.
13. Schultz M, Duarte I, Chianale J. Frequancy and histopathological features of chronic gastritis in 300 patients without endoscopic lesions. Rev Med Chill. 1996; 124: 545-52.
14. Thapa R, Lakhey M, Yadav PK, Kandel P, Aryal C, Subba K. Histopathological study of endoscopic biopsies. J Nepal Med Assoc 2013; 52(190): 354-56.
15. Nafees A Qureshi, Michael T Hallissey, John W Fielding. Outcome of index upper gastrointestinal endoscopy in patients presenting with dysphagia in a tertiary care hospital- A 10 years review. BMC Gastroentrology 2007; 7: 43.
16. Preiser F, Carneiro F, Correa P, Guilfold P, Lambert P, Megraud F. Gastric carcinoma. In: Hamilton SR, Altonen LA, editors. Pathology and genetics of tumors of the digestive system- WHO Classification of tumors. Lyon, France: IARC Press; 2000: 38-52.
17. Cherian JV, Sivaraman R, Muthusamy AK, Jayanthi V. Carcinoma of esophagus in Tamil Nadu (South India): 16 year trends from a tertiary centre. J Gastrointestinal Liver Dis 2007; 16(3): 245-49.
18. Rumana M, Khan AR, Khurshid N. The changing pattern of oesophago-gastric cancer in Kashmir. JK Pract. 2005; 12(4): 189-92.
19. Marson BC, Dawson IMP. Gastrointestinal pathology, 2nd ed. London: Black Well Scientific Publications; 1998. p. 148-51.
20. Mills SE, Carter D, Greenson JK, Oberman HA, Reuter V, Stoler MH. Sternberg's diagnostic surgical pathology, 4th ed. Philadelphia: Lippincott Williams and Wilkins; 2004. p. 1562-73.
21. Gajalakshmi V, Swaminathan R, Shanta V. An independent survey to assess completeness of Registration: Population based cancer registry, Chennai, India. Asian Pac J Cancer Prev 2001; 2: 179-83.
22. Hussian SI, Reshi R, Akther G, Beigh A. A clinicohistopathological study of upper gastrointestinal tract endoscopic biopsies. Int J Cur Res Rev. 2015; 7(16): 78-85.
23. Neil A Shepherd, Roland M Valori. Guidance for endoscopic biopsy in the gastrointestinal tract frontline. Gastroenterology. 2014; 5(2): 84-7.