

Research Article

Gastric neoplasms – An endoscopic biopsy study with review of literature

Sruthi Prasad*, Savithri Ravindra, Geethamani Venkat and Suguna Belur Venugopal

Department of Pathology, Kempegowda Institute of Medical Sciences, Bengaluru, Karnataka, India

***Correspondence Info:**

Dr. Sruthi Prasad, M.D Pathology
Assistant Professor
Department of Pathology,
Kempegowda Institute of Medical Sciences, Bengaluru, Karnataka, India
E-mail: sruthi.chandra@gmail.com

Abstract

Background: Gastric cancer is the 2nd leading cause of cancer related deaths worldwide as most of the patients present very late during the course of the disease due to non-specific symptoms.

Aims: To study the gastric neoplasms with reference to the age and sex occurrence, endoscopic presentation and histomorphology.

Settings and Design: Descriptive study

Methods and Material: The present study included biopsies of patients with suspected gastric malignancy at Kempegowda Institute of Medical Sciences, Bangalore, from January 2003 to January 2011. Brief clinical data were collected. Sections studied were diagnosed as per W.H.O classification and The Revised Vienna Classification of Gastrointestinal Neoplasia and the presence of any associated lesions noted.

Results: The study included 163 gastric biopsies of which 157 were neoplastic. There was a male predominance with a peak in the 5th to 7th decade. The commonest site of origin was antrum & prepylorus (59.87%) and commonest endoscopic presentation observed was ulcerative growth (62.42%). Of the 157 neoplasms, 153 (97.45%) were adenocarcinomas. The other 4 cases comprised of 2 cases of gastric carcinoid, one case each of gastric lymphoma and GIST. The associated findings noted were *H. pylori* infection (22.87% adenocarcinomas), chronic atrophic gastritis (23.52% adenocarcinomas), intestinal metaplasia (9.15% adenocarcinomas), fungal infection and a hyperplastic polyp. Of the 163 biopsies, majority were grouped under categories 4 and 5 (61.34% and 29.44% respectively) of The Revised Vienna classification.

Conclusions: Endoscopy with assisted biopsy is the gold standard for diagnosis of gastric cancer. A team approach towards treatment involving the pathologist and clinicians becomes crucial.

Keywords: Gastric carcinoma, Gastric biopsy, Endoscopic biopsy, *H. pylori*, Intestinal metaplasia, Revised Vienna classification

1. Introduction

Gastric cancer is the 4th most common cancer and the 2nd leading cause of cancer related deaths worldwide¹. It is more common in Asian countries. Gastric carcinomas are often detected late, as the patients are either asymptomatic or present with mild non-specific symptoms in the early stages of the disease. Endoscopy with assisted biopsy is regarded as the most sensitive and specific diagnostic method for the early detection of gastric cancers. Endoscopically directed biopsies now constitute the bulk of Gastrointestinal (GI)-related specimens received in many surgical pathology laboratories. Moreover, this technique has revolutionized the way that clinicians and pathologists interact. Study of endoscopic biopsies

also aids in the categorization of the gastric neoplasms into carcinomas/ lymphomas / Gastrointestinal Stromal tumor (GIST) etc, which becomes crucial for clinical management as the treatment protocols vary. Adequate biopsies can also reveal the presence of any associated/ predisposing lesions (*H. pylori* infection, chronic atrophic gastritis/ intestinal metaplasia/ fungal infections/ hyperplastic polyps), which in turn help in study of the epidemiology of the disease. Further, implementation of recent classifications for reporting of endoscopic biopsies, with matching treatment protocols revolutionizes the entire concept. Now, more than ever, the GI pathologist has become a consultant who is crucially involved at all levels of the clinical decision making process.

1.1 Aims and Objectives

The objectives were to study the gastric neoplasms with the age and sex occurrence, endoscopic presentation and histomorphology, as well as to note the presence of associated/predisposing lesions such as *Helicobacter pylori* infection, intestinal metaplasia, and chronic atrophic gastritis. We have applied the Revised Vienna Classification for typing of the gastric neoplasms.

2. Methodology

The present study included gastric biopsies of patients with suspected gastric malignancy at Kempegowda Institute of Medical Sciences, Bangalore, from January 2003 to January 2011. Brief clinical data were collected from the case records, which included the age and sex of the patients, presenting symptoms, endoscopic findings (sub site and nature of growth) and diagnosis. A minimum of 4 to 6 bits were studied in each case.

The endoscopic biopsy specimens thus obtained were fixed in 10% buffered formalin. Before processing, the samples were stained with eosin for their better and complete visualization and wrapped in a tissue paper to prevent dispersion and actual loss of tissue. All the bits were embedded together for ideal visualization. Then, sections 4 to 6 microns thick were prepared. These sections were stained routinely with Hematoxylin and Eosin. Additional sections were stained with Giemsa to look for the presence of *Helicobacter pylori*.

Other special stains like Periodic acid Schiff (PAS), Reticulin stain and Grimelius stain were performed wherever necessary. The lesions were diagnosed as per WHO classification of tumors. A new classification system- "The Revised Vienna Classification of Gastrointestinal Neoplasia" was also applied to all the biopsies. The presence of associated/predisposing lesions such as intestinal metaplasia, *H. pylori* infection, and chronic atrophic gastritis were noted.

3. Results

The study included 163 gastric biopsies of which 157 were neoplastic. The age of the patients varied from 23 years to 98 years with a peak in the 5th to 7th decade (71.33%). There was a male preponderance with 105 (66.87%) male patients and 52 (33.12%) female patients. The male: female ratio was 2.01:1

The common presenting symptoms were weight loss with anorexia or weight loss with dyspepsia. The commonest site of origin (Table 1) was the antrum and prepylorus (59.87%), followed by fundus (20.38%) and the body (16.56%). One case involved the entire stomach. There were 4 cases of recurrence at the Gastrojejunostomy stoma. The commonest endoscopic presentation (Table 2) observed was ulcerative growth (62.42%), followed by infiltrative (24.84%) and polypoidal growth (12.73%).

Table 1: sub-sites and histopathological diagnosis of gastric biopsies

Sub-site	Tumor type		
	Adenocarcinoma	Others	Total No. (%)
Antrum & Prepylorus	93 (60.78%)	01	94 (59.87%)
Fundus	31 (20.26%)	01	32 (20.38%)
Body	24 (15.68%)	02	26 (16.56%)
Entire stomach	01 (0.65%)	-	01 (0.63%)
GJ stoma	04 (2.61%)	-	04 (2.54%)
TOTAL	153 (100%)	04	157 (100%)

GJ - Gastrojejunostomy

Table 2: Endoscopic presentation and histopathological diagnosis of gastric biopsies

Endoscopic Presentation	Tumor type		
	Adenocarcinoma	Others	Total No. (%)
Ulcerative	95 (62.09%)	03	98 (62.42%)
Infiltrative	39 (25.49%)	-	39 (24.84%)
Polypoidal	19 (12.41%)	01	20(12.73%)
Total	153 (100%)	04	157(100%)

Of the 157 neoplasms, 153 (97.45%) were adenocarcinomas (Fig 1, 2, 3, 4). The other 4 cases comprised of 2 cases of gastric carcinoid, one case each of gastric lymphoma (Fig 5) and gastrointestinal stromal tumor (GIST, Fig 6).

The most common histopathological type of the gastric adenocarcinoma was tubular (126 cases, 82.35%, Fig 1, 2) followed by signet ring (23 cases, 15.03%, Fig 3), and papillary (4 cases, 2.61%) carcinomas. The tubular adenocarcinomas were mostly moderately differentiated (72 cases, 57.14%, Fig 2), with the remaining being poorly differentiated (33 cases, 26.19%, Fig 4) and well differentiated (21 cases, 16.66%, Fig 1).

The various associated findings encountered in gastric adenocarcinomas were *H. pylori* infection, chronic atrophic gastritis, intestinal metaplasia, gastric polyps and fungal infection. Of the 153 cases of adenocarcinoma, 35 cases (22.87%) showed *H. pylori* infection (Fig 7) and two cases showed fungal infection (Fig 4). There were 36 cases (23.52%) of chronic atrophic gastritis and 14 cases (9.15%) of intestinal metaplasia (Fig 7). A single case of hyperplastic polyp associated with a moderately differentiated tubulo-papillary carcinoma presented as a polypoid growth in the antrum.

The single case of gastric lymphoma encountered in the study was positive for *H. pylori* and fungal infection with features of chronic atrophic gastritis and intestinal metaplasia. The fungal infection was characterized by the presence of spores and pseudohyphae of *Candida* species (Fig 5).

Fig 1. Well-differentiated adenocarcinoma- stomach; showing irregular atypical glands lined by pleomorphic cells (H & E, 40x)

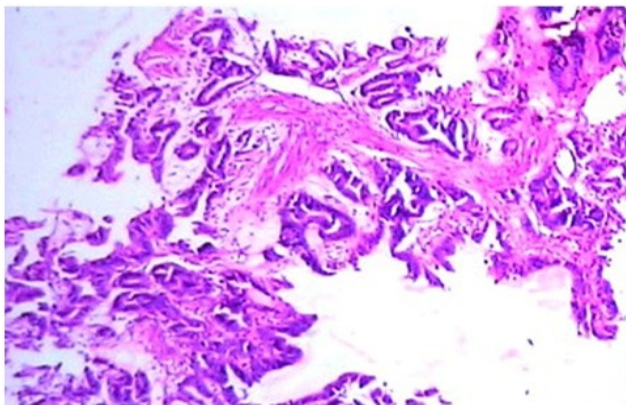


Fig 3. Signet ring cell carcinoma - stomach (H & E, 100x) with inset showing positivity by PAS stain (100x)

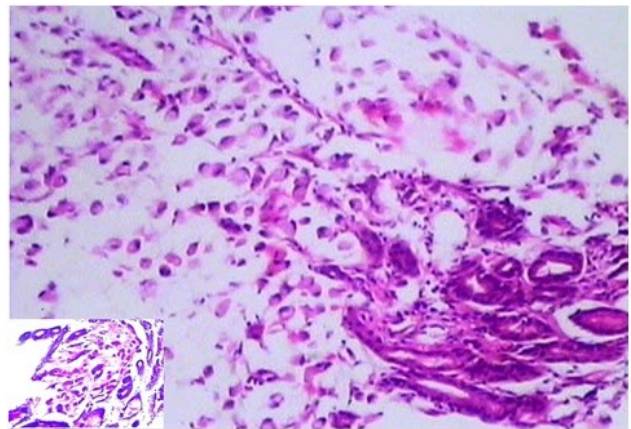


Fig 2. Moderately differentiated adenocarcinoma- stomach showing irregular atypical glands and cords of pleomorphic cells infiltrating the muscularis mucosa (H & E, 100x)

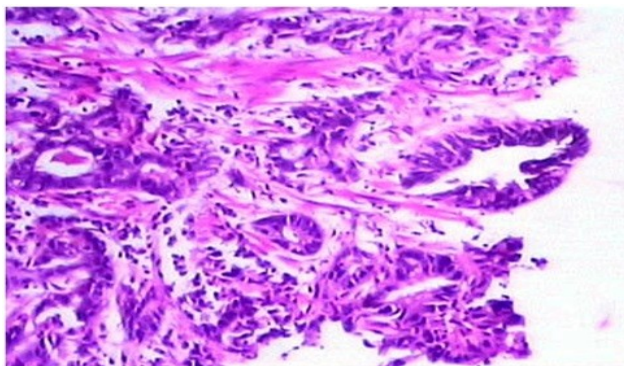


Fig 4. Poorly differentiated adenocarcinoma- stomach; showing hyphal forms (lower left) of *Candida albicans* (H & E, 100x)

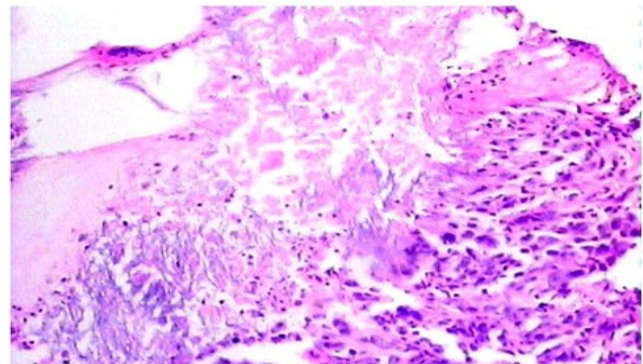


Fig 5. Lymphoma- stomach; showing sheets of uniform appearing tumor cells with large hyperchromatic nuclei and scant cytoplasm (H & E, 100x) with inset showing spores and pseudohyphae of *Candida albicans* (H & E, 400x) and upper left inset showing positivity for Reticulin stain (100x)

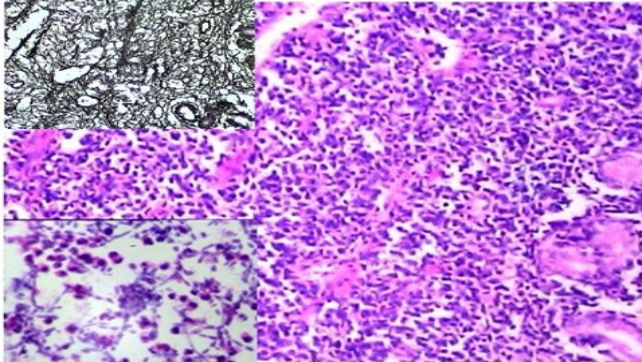


Fig 6. GIST- stomach (H & E, 100x) with inset showing elongated spindle cells with pleomorphic nuclei (H & E, 400x)

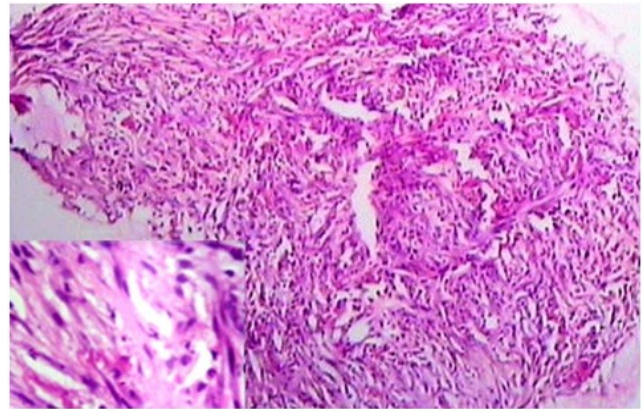
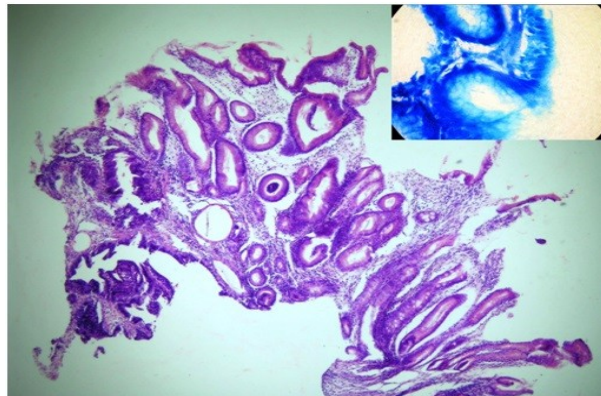


Fig 7. Adenocarcinoma with intestinal metaplasia (H & E, 40x) and inset showing giemsa stain with *H. pylori* (Giemsa, 1000x)



One of the two carcinoid tumors showed features of intestinal metaplasia and chronic atrophic gastritis. The Revised Vienna classification of Gastrointestinal Epithelial Neoplasia (Table 3) was applied to all the 163 biopsies. 48 biopsies, 29.44% were grouped under category 5 invasion into submucosa; 100 cases, 61.34% in 4[4.3, 4.4] i.e. mucosal high grade neoplasia; 7 cases, 4.29% were grouped under category 3; 3 cases (1.82% each) each, in category 2 and category 1. The classification was not applicable in 2 non-epithelial gastric neoplasms which included- malignant lymphoma and GIST.

Table 3: The revised vienna classification of gastrointestinal epithelial neoplasia²⁴

Category	Diagnosis	Clinically equivalent terms	Clinical management
1	Negative for neoplasia	-	Optional follow up
2	Indefinite for neoplasia	-	Follow up
3	Mucosal low-grade neoplasia	LGIN, low-grade adenoma/dysplasia	Endoscopic resection or follow up*
4	Mucosal high-grade neoplasia	4.1 HGIN, high-grade adenoma/dysplasia 4.2 HGIN, non-invasive carcinoma(CIS) 4.3 Suspicious for invasive carcinoma 4.4 Intramucosal carcinoma	Endoscopic or surgical/local resection*
5	Submucosal or deeper invasion by carcinoma		Surgical resection*

LGIN, low-grade intraepithelial neoplasia; HGIN, high-grade intraepithelial neoplasia, including both categories 4.1 and 4.2; CIS, carcinoma in situ; intramucosal, invading into the lamina propria or muscularis mucosae.

*For well- and moderately differentiated gastric, oesophageal and non-polypoid colorectal carcinomas showing only minimal submucosal invasion (sm1) without lymphatic vessel invasion, local resection is sufficient.

Likewise, for polypoid colorectal carcinomas with deeper submucosal invasion in the stalk/base but without lymphatic vessel invasion, local resection is insufficient. For poorly differentiated intramucosal gastric carcinomas larger than 1 cm, surgical resection with lymph node dissection is indicated.

*Choice of treatment will depend on the size of the lesion, the depth of invasion as assessed endoscopically, radiologically, or ultrasonographically, the histological differentiation grade, and on general factors such as the patient's age and comorbid conditions.

The revised Vienna Classification is used for glandular and squamous lesions throughout the entire gastrointestinal tract, and for the diagnosis of biopsy as well as resected specimens.

4. Discussion

Cancers of stomach have a great diversity in geographical distribution. Gastric cancers are the second most common cancers worldwide, as observed by Parkin *et al* and Fuchs *et al*^{2,3}. The wide geographic and cultural variations in gastric cancers suggest that environmental exposure is rather important. Gastric cancer has a marked geographic variation in its incidence. A high incidence is seen in Japan, Korea, China as well as Central and South America. Incidence rates are lower in Southern Asia, North America and Africa⁴. The highest rate in males was seen in Japan-80/100,000 and the lowest rate was in Thailand, around 3/100,000 population. Among females also the highest rate of 31/100,000 was in Japan and the lowest of 1.0 was in Trivandrum, India⁵. The variations in gastric cancer rates seen in India have been quite marked as noted in National Cancer Registry Programme 2010⁶. In South India, it is common in Chennai (age adjusted incidence rate of 11.8/100000 in males and 6/100000 in females) followed by Bangalore (age adjusted incidence rate of 9.5/100000 in males and 5.6/100000 in females)⁷.

The geographic variation was accounted for by the differences in incidence in non-cardia cancer. It was seen that cancer localized to the cardia had a more uniform distribution⁸. It is also seen that first-generation migrants who have migrated from high risk to low risk countries sustain the risk rate of their native country whereas subsequent generations acquire the risk rate of their new environment.

Verse was the first to describe early gastric cancer of the stomach as an entity in the year 1903. He reported seven cases of schleimhautcarcinome with carcinoma involving the mucosa and submucosa. Subsequently, such a tumor has been reported variously as carcinoma in situ, carcinoma of superficial spreading type, superficial carcinoma, superficial erosive cancer and surface carcinoma. It was not until 1962 that the concept of early gastric cancer was firmly established when the macroscopic classification of early gastric cancer was presented by the Japanese Gastroenterological Endoscopy Society. Since then combined meetings of clinicians and pathologists have made remarkable progress in diagnostic methods for early gastric cancer, especially in radiologic and endoscopic studies based on morphologic features⁹.

Endoscopy with endoscopic biopsy is currently the gold standard for the diagnosis of Gastrointestinal (GI) neoplasms. There has been a decrease in deaths from gastric cancer because of earlier detection and thus improved management of the disease¹⁰. We studied 163 gastric biopsies of suspected neoplastic lesions of which 157 cases were gastric neoplasms.

Gastric cancer incidence rises progressively with age, most patients being between the ages of 50 and 70 years at presentation. Cases of cancer in patients under 30 years are rare. Non cardia cancer is more common in males than females by a ratio of approximately 2:1, while, gastric cardia cancer has a higher male to female ratio, of nearly 6:1¹¹.

Patients with gastric cancer presented with ages ranging from the 3rd to 10th decade. The youngest patient was 23yrs and the oldest was 98yrs. The mean age of the patients was 59.57yrs with a peak (57.5%) in the 5th to 7th decade. The observations were similar to those seen in studies carried out by Gauri-Bazaz-Malik¹², which showed a peak (56.44%) in the 5th and 6th decades.

Gastric cancer was more common in males (66.87%) as compared to females (33.12%). The male: female ratio was 2.01:1 which is in concordance with other studies which showed a ratio of 2:1¹¹.

In the stomach, as in the esophagus and intestines, tumors arising from the mucosa predominate over mesenchymal and stromal lesions. All the 157 neoplasms were malignant. These comprised of 153 (97.45 %) cases of adenocarcinoma, 2 cases of carcinoid, single case each of large cell lymphoma and GIST. Our study is in concordance with other studies where

adenocarcinomas accounted for 90-95% of gastric cancers.^{13,11,2}. The slightly higher incidence of adenocarcinomas in our study could be attributed to missing out some of the submucosal lesions like GIST and lymphoma which are not easily accessible to biopsy.

During the last century, a variety of classifications have been proposed for gastric carcinomas by various authors, the most widely accepted being the WHO classification 2000.

Gastric adenocarcinoma can either be early gastric carcinoma or advanced gastric carcinoma.

“**Early**” Gastric Carcinoma (*surface, superficial, superficial spreading, and microinvasive cancer*)¹⁴ is defined as a carcinoma confined to the mucosa or to the mucosa and submucosa (not extending into the muscularis externa), regardless of the status of regional lymph nodes. *Intramucosal carcinoma* is the type of superficial carcinoma which is limited to the mucosa. This particular variant needs to be differentiated from dysplasia-CIS, which does not show invasion through the basement membrane.

Advanced Gastric Carcinoma can present grossly as polypoid, fungating, ulcerated or diffusely infiltrating (linitis plastica) forms. It can present either in one of the above forms or may show a combination of these. Ulcerated tumors occur in the antrum on the lesser curve, they have irregular contours and raised, rolled edges. The polypoid and fungating types are common in the corpus, often the greater curve. The diffusely infiltrating type often presents with conspicuous thickening of the wall, or sometimes the entire stomach – leather bottle stomach. In the present study, most of the adenocarcinomas were seen in the antrum and prepylorus- 93cases (60.78%), followed by fundus – 31 cases (20.26%) and the body-24 cases (15.68%). One case showed involvement of the entire stomach (0.61%). There were 4 cases of recurrence, where involvement of gastrojejunostomy stoma (2.61%) was seen. The commonest endoscopic presentation was an ulcerative growth (95 cases, 62.09%), followed by infiltrative (39 cases, 25.49%) and polypoidal growth (19 cases, 12.41%). Similar findings were noted in other studies with the commonest site being the antrum and the commonest type of presentation being ulceration¹⁵.

Microscopically they may have tubular, acinar or papillary structures or poorly cohesive single cells that are widely infiltrative and dissect through the layers of the gastric wall. Papillary carcinomas are characterized by the presence of numerous papillary processes with fibrovascular cores. The tubular adenocarcinomas were characterized histologically by the presence of branching tubules of varying sizes lined by columnar to cuboidal cells with eosinophilic cytoplasm and hyperchromatic nuclei. Mucinous adenocarcinomas (colloid or mucoid carcinoma) are characterized by the presence of conspicuous amounts of extracellular mucin (more than 50% of the tumor). Signet ring carcinomas are diffusely infiltrating tumors, accompanied by marked fibrosis, giving rise to linitis plastica appearance. They consist of predominantly single cells or small clusters of cells containing intracytoplasmic vacuoles and accounting for more than 50% of the tumor. The tumor cells usually produce mucus, which is positively stained by diastase-PAS or alcian blue. The histopathological types noted were tubular adenocarcinomas (126, 82.35%), signet ring carcinomas (23, 15.03%, Fig 3) and papillary carcinoma (4, 2.61%). Most of the tubular adenocarcinomas were moderately differentiated (57.14%, Fig 2) followed by poorly differentiated (26.19%, Fig 4) and well differentiated (16.66%, Fig 1).

We encountered two cases of gastric carcinoid (1.27%), both presented in the body one as a small polyp another as an ulcer (Table 1 and 2). They were both characterized histologically by the presence of cells, which were arranged in acinar and trabecular pattern. The cells were small, uniform with finely granular eosinophilic cytoplasm and oval nuclei with stippled chromatin. The term carcinoid is derived from the word *karzinoide* meaning “carcinoma-like”. It was first coined by Siegfried Oberndorfer in 1907¹⁶. These tumors comprise less than 1% of the neoplasms of the stomach and are commonly associated with chronic atrophic gastritis. They present as small, smooth, firm, well-circumscribed, polypoid elevations of the mucosa and submucosa with a yellow-gray cut surface. Our study is in concordance with other studies which have observed that gastric carcinoids make up about 1% of all gastric neoplasms and that they are almost always located in the fundus and body¹⁷. Based on their pathologic features, gastric carcinoids can be classified into benign, borderline, low-grade malignant and high-grade malignant¹⁸. Some carcinoids can present with cytologic atypia in the form of nuclear pleomorphism and hyperchromasia with prominent nucleoli, a more infiltrative growth pattern with obvious vascular invasion and areas of necrosis. There are more than 2 mitotic figures per 10 high-power fields. These carcinoids are called “*atypical carcinoids*”. Rarely carcinoids, with atypical features can co-exist with adenocarcinomas, so-called *composite tumors, adenocarcinoids or carcinoid adenocarcinomas*.

The single case of GIST (0.63%) was seen in a 50 year old lady who presented with a submucosal polypoidal

growth in the body (Table 1 & 2). The microscopy showed fascicles of spindle shaped cells, with pale eosinophilic cytoplasm and spindle to ovoid nuclei with fine chromatin (Fig 6). GISTs account for 2.2% of malignant gastric tumors, affecting adults between 6th and 8th decade and presenting commonly as serosal (Fig 12), submucosal or intramural nodules¹⁹.

The single (0.63%) case of high grade gastric lymphoma in a 68 year male, presented with an ulcerated growth in the antrum (Table 1 & 2). It was characterized by the presence of sheets of cells twice the size of small lymphocytes with scant cytoplasm and irregular hyperchromatic nuclei. Numerous mitotic figures and karyorrhectic debris was noted (Fig 5). As noticed in the current case as well, crush artefact is a common feature of lymphomas on endoscopic biopsies. A reticulin stain was performed for confirmation of the diagnosis (Fig 5). Primary gastric lymphomas are defined as those originating from the stomach and contiguous lymph nodes. Most of the patients are over 50 years of age. They are common in the antrum and present as nodular masses, where as high grade lymphomas are larger and more frequently associated with the presence of a mass with ulceration²⁰. This is similar to the findings observed in the present study. Gastric lymphomas constitute about 50% of all digestive tract lymphomas²¹, most common type being the *marginal zone lymphoma of MALT type*.

Submucosal lesions such as GIST, lymphomas and carcinoid may be missed if the biopsy is very superficial. However in the presence of surface ulceration, a biopsy from the ulcerated area may reveal the presence of the lesion.

In recent years, there have been many efforts to categorize the diagnoses of biopsy material and endoscopically resected specimens of tumors of the digestive tract. From 1996 to 1998, groups of 8 to 31 pathologists and a clinician from 12 different countries held histological slide seminars in Tokyo, Munich, Padua and Vienna, leading to several slightly different classifications of gastrointestinal epithelial neoplasia that were published from 1998 to 2000^{22,23}. Since 2001, several review articles from Japan, Germany, the United Kingdom, the United States and Canada have concluded that these problems can best be resolved by use of the Revised Vienna classification.

The Revised Vienna classification of Gastrointestinal Epithelial Neoplasia was applied to all the 163 biopsies. 48 biopsies were grouped under category 5; 100 cases in group 4 [4.3, 4.4] i.e. mucosal high grade neoplasia; 7 cases were grouped under category 3; 3 cases in category 2 and 3 in category 1. The classification was not applicable in 2 non-epithelial gastric neoplasms which included- malignant lymphoma and GIST.

Though, this classification gives the treatment options, the major limitation is that one cannot comment on the submucosal invasion when the biopsy doesn't involve the submucosa, such cases might get wrongly categorized into group 4 when the case may be actually in group 5, Thus these lesions need to be grouped as "atleast group 4", and it becomes imperative for the clinician to consider the endoscopic, radiological, and biopsy findings in conjunction for decision making.

Gastric adenocarcinoma has various pre-disposing factors like *H. pylori* infection, chronic atrophic gastritis, intestinal metaplasia, gastric polyps²⁵.

Helicobacter pylori, was first isolated from gastric biopsies in 1983 by Barry Marshall and Robin Warren. An international population study performed by Eurogast study group found that countries with high gastric cancer rates have a high prevalence of *H. pylori*²⁶. Patients with *H. pylori* infection reportedly have a three to six fold increased risk of gastric carcinoma and a 6 fold risk of gastric lymphoma than those without the infection. Also, the Cag A virulence factor is strongly associated with adenocarcinoma whereas its absence carries a low risk of adenocarcinoma²⁷. *H. pylori* has a reported prevalence of 85-93% in gastric cancers and 92-100% in lymphomas²⁸. However they noted that *H. pylori* infection is less common in high-grade lymphomas (25-38%)²⁰. It was also seen that eradication of the organism in patients with MALT lymphoma often leads to regression of the tumor in 75% of the cases²⁹. Indian studies quote a lower association of *H. pylori* with gastric cancer³⁰. In a review of *H. pylori* studies in relation to gastric cancers it was observed that the established link between *H. pylori* and stomach cancer in Japan is not repeated in countries like India and Bangladesh which have a higher prevalence of *H. pylori* but lower incidence of gastric cancer³¹. In a study on 50 patients with gastric cancer and 50 controls with non-ulcer dyspepsia, *H. pylori* infection was detected less frequently in gastric cancer (38%, 19/50) than those with non-ulcer dyspepsia (68%, 34/50)³². Another study demonstrated that 64.7% (33/51) patients with gastric carcinoma and 74.4% (32/43) with non-ulcer dyspepsia had infection with *H. pylori*³³. South Indian studies have shown alcohol and pickled food consumption as significant risk factors for development of gastric cancer³⁴. The present study

showed *H. pylori* in 35 of 153 cases (22.87%, Fig 7) of adenocarcinoma and in the single case of lymphoma.

Atrophic gastritis, peptic ulcer, adenomas and polyps have also been identified as precursors to gastric carcinoma²⁵. Chronic atrophic gastritis and Intestinal metaplasia are very closely linked to an increased risk of intestinal type of gastric carcinoma. Prevalence of chronic atrophic gastritis and intestinal metaplasia is highest in regions of the world having high rates of gastric carcinoma. We noted 36 cases (23.52%) of chronic atrophic gastritis and 14 (9.15%) showing intestinal metaplasia (Fig 7). One of the two carcinoids showed features of chronic atrophic gastritis and intestinal metaplasia.

In the case of polyps, certain studies have shown that 59% of adenomatous polyps and 28% hyperplastic polyps were associated with gastric cancer³⁵. There was one case of hyperplastic polyp associated with a moderately differentiated tubulo-papillary carcinoma presenting as polypoid growth in the antrum.

Presence of fungal infections in cancers, could be attributed to a failure of the immune defense mechanisms in association with cancers. Fungal infection was noted in two cases of adenocarcinoma and the lymphoma (Fig 4, 5).

4. Conclusion

Endoscopy with assisted biopsy is the gold standard in the diagnosis of gastric cancer. With varying treatment protocols and different classification systems for gastric malignancies, a team approach involving the gastroenterologist, radiologist, surgical pathologist, and surgeon becomes crucial for optimal patient care.

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