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## Original Research Article

## Histopathological spectrum of gastrointestinal lesions - In a tertiary care centre

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## ABSTRACT

**Introduction:** Gastrointestinal (GI) pathology is one of the largest sub-specialities in pathology. Histopathological evaluation of GI lesions is the gold standard for providing essential diagnostic and prognostic information to the clinicians for the best timely management of each patient.

**Materials and Methods:** This is an unicenter retrospective and prospective study of 510 patients with GI lesions over a period of 2 years from July 2021 to June 2023. Biopsies and resected specimens of gastrointestinal tract were fixed in 10% formalin. Those specimens were then processed in automatic tissue processor. Routine Haematoxylin and Eosin stain and special stains, including immunohistochemical stains were done, whenever indicated. Then slides were examined and data generated from observation and was used for statistical analysis.

**Results:** Out of total 2462 histopathological specimens received in 2 years, over 21% of specimens were GIT lesions of them 510 were GI specimens. Gall bladder was the most common specimen received [34.3%] followed by appendix specimens [18.6%] and gastric biopsies [13.9%]. Non neoplastic GI lesions [89.3%] were the most common followed by neoplastic lesions [10.7%]. Males outnumbered female patients having M: F ratio 1.3:1. The peak incidence of non neoplastic lesions are found in the age group of 21-40 years and that for neoplastic lesions found in the age group of 50-70 yrs. Chronic cholecystitis was the most common GI pathology [34.3%] followed by appendicitis [18.1%]. Adenocarcinoma was the most common histopathological malignancy [52.7%] followed by squamous cell carcinoma [47.2%]. Most common lesion in the oesophagus and oral cavity was squamous cell carcinoma whereas adenocarcinoma was most common in colo-rectum.

**Conclusion:** This study enables the overview of the spectrum of histopathological lesion encountered in the surgical pathology department and also reiterates that the histopathological evaluation is a valuable diagnostic tool for definitive and early diagnosis of GI lesions which has an impact on management of neoplastic lesions.

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## 1. Introduction

Gastrointestinal tract (GIT) diseases are one of the most common entities, we come across in a day today practice.<sup>1</sup> Gastrointestinal biopsies constitute a large chunk of specimens received in the department of histopathology in any tertiary care hospital.<sup>2</sup> Given its sheer length

and extent, there is possibility of various pathologies affecting individual segments of entire tract ranging from congenital anomalies, inflammatory conditions to neoplastic conditions, including both benign as well as malignant lesions. The spectrum of diseases which can occur individually or in combination with various segments is wide.<sup>1</sup> Histopathology is regarded as the most sensitive and specific diagnostic method (Gold Standard) for detection

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of GIT lesions (especially malignant cases) and plays an important role in the diagnosis and therefore, aids in early management.<sup>3</sup>

In general, inflammatory lesions of GIT are more common, followed by malignant lesions, while benign neoplasms are rare.<sup>4</sup> Leading inflammatory lesions are acute appendicitis (AA) and gastritis, while the pattern of malignant lesions varies from geographic locations to another depending on genetic factor and environmental factors (diet and social habits).<sup>5</sup> The specimens of GIT comprise of endoscopic biopsies from gastric and duodenal mucosa, colonoscopic biopsies, partial and hemicolectomies, appendectomy and laparotomy.<sup>6</sup>

This study aims to describe the histopathological pattern of all GIT lesions seen in a tertiary care hospital in south India.

## 2. Materials and Methods

This is a 2-year retrospective study of 512 patients conducted in Department of Pathology, Sri Siddhartha Medical College, a tertiary care center in south India from July 2021 to June 2023. Biopsies and resected specimens which included excision biopsies, incision biopsies, appendectomies, small and large intestinal resection specimens, endoscopies and colonoscopic biopsies. These were fixed in 10% buffered formalin, followed by grossing and sections were taken from appropriate sites, and were processed in automated tissue processor and paraffin embedded sections were taken (5micro meter thick) and stained with Hematoxylin and Eosin. Special stains and immunohistochemical stains were used whenever required. Results were tabulated and statistically analyzed.

## 3. Results

A total 512 specimens received in two years were included in the study. The age wise distribution shows maximum number of cases belonging to age group of 51-60 years (23.63%), least common was in the age group of 10-20 years (7.61%). There was male preponderance in our study, 281 males (54.88%) with GI lesions as compared to 231 (45.11%) females; having M:F ratio 1.2:1. Most common age group having neoplastic pathology was 51- 60years having 121 cases (23.63%), followed by the age group 61-70 years with 89 cases (17.38%)(Table 1).

Out of 512 specimens, gall bladder was found to be the most common tissue (34.17%) involved, followed by appendix (18.55%), small intestine (15.23%) and stomach (13.08%), large intestine and anorectum comprises of (7.6%) followed by oral cavity 1.56%. [Table 2]

On histopathological evaluation non-neoplastic lesions in various GI sites were the most common finding (84.37%), followed by neoplastic lesions (15.62%).

Premalignant and dysplasias are accounted for 0.8%.

**Table 1:** Age group distribution of GIT cases

Age (in years)	Number of cases (n)	Percentage (%)
10-20	39	7.61%
21-30	59	11.52%
31-40	71	13.86%
41-50	84	16.40%
51-60	121	53.63%
61-70	89	17.38%
>70	49	9.57%
Total	512	100%

**Table 2:** Organ wise distribution of GIT specimens

Site	Number of specimen	Percentage (%)
Oral cavity	8	1.56%
Oesophagus	50	9.76%
Stomach	67	13.08%
Small intestine	78	15.23%
Appendix	95	18.55%
Gall bladder	175	34.17%
Large intestine & anorectum	39	7.61%
Total	512	100%

Gall bladder was the commonest site for non-neoplastic lesion (39.06%) followed by appendix lesions (20.75%), whereas neoplastic lesions were detected more in esophagus (53.75%) followed by stomach (17.5%).

In H Pylori associated chronic active gastritis (6.3%) was detected by IHC stains using Biogenx Anti-Helicobacter pylori polyclonal marker for H.Pylori.

Out of total 80 neoplastic lesions, malignant lesion were 76.2% and benign 23.75%.

Esophagus was the most common organ (53.75%) involved in malignant lesions followed by stomach (17.5%) and small intestinal (10%) (Table 3).

**Table 3:** Showing distribution of GIT lesion according to site and type

Site	Neoplastic	Non-neoplastic	Totalpercentage (%)
Oral cavity	06	02	1.56%
Oesophagus	43	07	8.98%
Stomach	14	53	13.86%
Small intestine	08	70	15.23%
Appendix	02	93	18.55%
Gall bladder	0	175	34.17%
Large intestine and anorectum	07	32	7.61%

Esophageal lesions were the most common in the age group of 51-60 years.

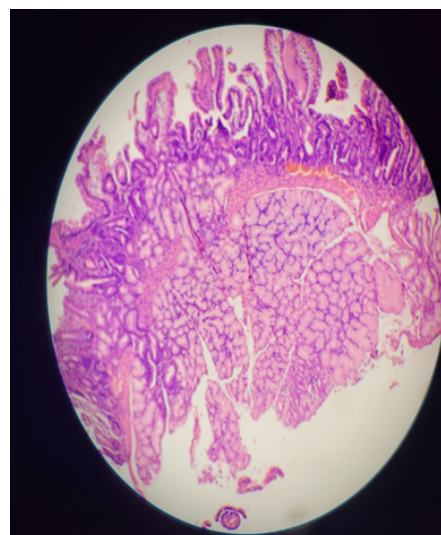
Squamous cell carcinoma (63.93%) was the most common pathological finding in 39 cases of malignancy followed by adenocarcinoma (32.78%) in 20 cases: least common was malignant melanoma and lymphoma (1.63%each). (Table 4)

**Table 4:** Showing Histopathological type of malignant lesions

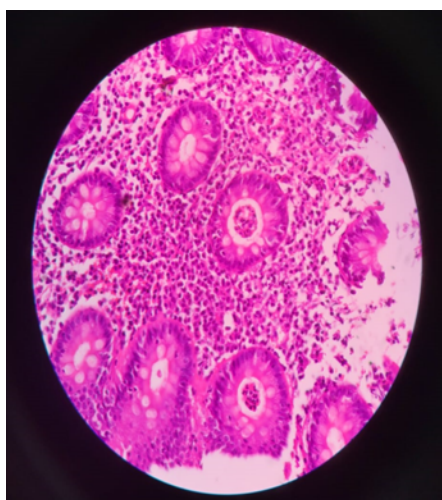
Type	Number	Percentage (%)
SCC	39	63.93%
Adeno carcinoma	20	32.78%
Malignant melanoma	01	1.63%
Lymphoma	01	1.63%
Total	61	100%

Most common type of histological differentiation seen was moderately differentiated grade of both adeno carcinoma and squamous cell carcinoma (55.5%) with 18.3% being poorly differentiated.

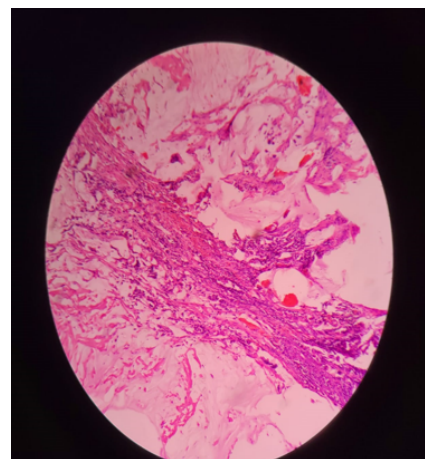
Few interesting cases came across in the study.



**Figure 2:** Brunner gland hyperplasia in 10 x



**Figure 1:** Photo micrograph ulcerative colitis in 10 x

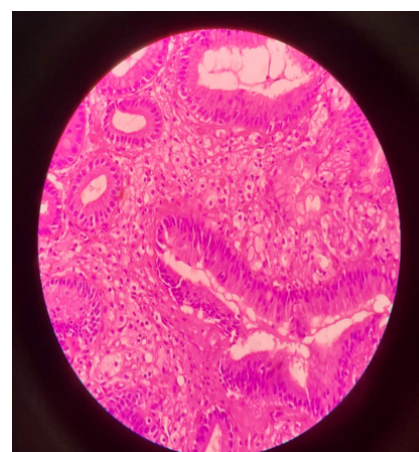


**Figure 3:** Mucin secreting adenocarcinoma appendix in 10 X

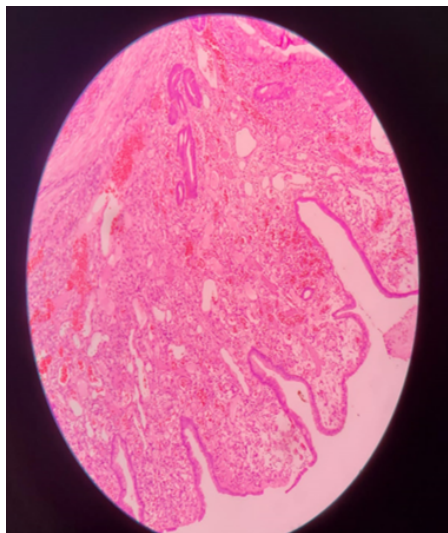
#### 4. Discussion

Gastrointestinal diseases are highly prevalent in India and carry economic and social consequences. Current demographic data shows India harboring more than 65% population below 35 years.<sup>1</sup> In the present study the most commonly affected age group was in 51-60 years. Preponderance of male with M:F ratio 1.2:1 was noted in the our study, similar to the results reported by other authors.(Table 5)

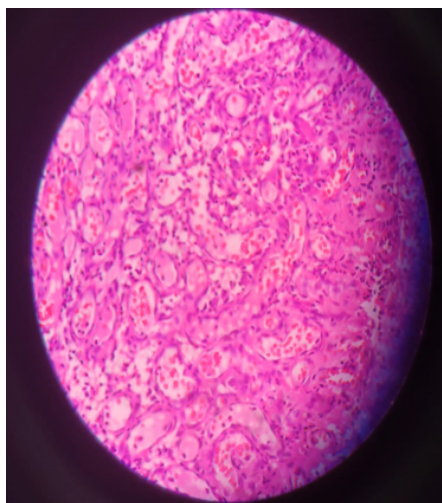
Most common form of GI pathology was inflammatory followed by neoplastic lesions.<sup>1</sup> In the present study, of the total 512 GI specimens there were, 84.37% inflammatory and 15.62% neoplastic lesions on histopathological examinations. Amongst the inflammatory lesions chronic



**Figure 4:** Xanthoma stomach in 10 x



**Figure 5:** Lobular capillary hemangioma stomach in 10 x



**Figure 6:** High power view of lobular capillary hemangioma stomach in 40 x

**Table 5:** Showing comparison of sex distribution of appendicitis

Authors	Total number cases	Male	Female	M:F
Aried, et al <sup>7</sup>	100	60	34	1.94:1
John Berry <sup>8</sup>	246	148	60	2.47:1
Crabbe, et al <sup>9</sup>	205	140	05	2.15:1
Patel, et al <sup>10</sup>	461	234	227	1.03:1
Present study	95	52	43	1.2:1

cholecystitis was the most common (34.17%) with high incidence in males. Of the 15.62% neoplastic lesions in our study, 11.91% were malignant and 3.71 % were benign lesions which is comparable to the results reported by other authors as in Table 6.

**Table 6:** Showing GIT histopathology lesions with various studies.

Authors	Total number of specimens	Inflammatory	Neoplastic lesions
Khatib, et al <sup>11</sup>	263	198(75.2%)	65(24.8%)
Thakur, et al <sup>5</sup>	800	740(92.5%)	40(75%)
Patel, et al <sup>10</sup>	969	953(98.3%)	16(1.7%)
Ekta, et al <sup>2</sup>	159	124(77.9%)	35(22%)
Present study	512	432(84.37%)	80(15.6%)

In our study dysplastic lesions (0.6%) and premalignant lesions (0.2%) were also seen. Hyperplastic polyp was the most common benign lesion found, in our study from the specimens of upper GI and large intestine.

#### 4.1. Oral cavity

In the present study 8 (1.56%) specimens were from oral cavity, of which 6 (75%) cases were malignant and all were squamous cell carcinoma and one case (12.5%) of leukoplakia and benign granular cell tumor each. The effected age in the study varied from 21-78 years with most common age group for malignancy being above 70 years, similar to study by Gupta I, Rani R, Suri J.<sup>12</sup> Male preponderance is seen in our study with M:F ratio of 3:1, similar to study by Rahul Y Sakpal et al.<sup>10</sup>

Buccal mucosa (4 cases -60%) was the most common site involved in the present study and squamous cell carcinoma was the most common malignant tumor in our study similar to studied by Gupta I et al and Rahul Y Sakpal.<sup>10,12</sup>

#### 4.2. Esophagus

In the present study 50(9.76%) specimens were from esophagus, of which 43 (86%) were neoplastic with 42 (97.6%) were malignant tumors and one (2.4%) case was of leiomyoma .Among the malignant lesions all were squamous cell carcinomas. The affected age group in our study various form 21-80 years with more commonly affected age group beign 51-60 years which was similar to studies reported by Sunitha Bamanikar et al<sup>1</sup> and Khatib et al.<sup>11</sup>

#### 4.3. Stomach

Of the total GI specimens evaluated, 67 (13.08%) specimens were from gastric lesions, where affected age group varied from 21-80years and most commonly affected age group was 61-70years. There was female preponderance



**Table 7:** Comparison of organ wise distribution of GIT malignancy

Authors	Esophagus	Esophagus	Small intestine	Colo-rectum
Sunita bamanikar et al <sup>1</sup>	27.8%	63%	2.2 %	43.7%
Sabharwal, et al <sup>13</sup>	25.3%	7%	0.5%	62.6%
Prabhaker et al <sup>14</sup>	31.4%	6%	0.03%	62.3%
Kamal, et al <sup>15</sup>	14.9%	34.2%	6.1%	44.7%
Thakur, et al <sup>5</sup>	19.23%	7.6%	5.7%	67.3%
Ekta et al <sup>2</sup>	37.14%	5.7%	17.14%	45.7%
Our study	63%	15.3%	3.07%	7.7%

with male to female ratio of 1:1.2. In the present study gastritis (79.1%) was the commonest gastric lesion followed by neoplastic lesions (20.89%). Among the inflammatory lesions, *H. pylori* induced gastritis was seen in 5.1% of cases. Among neoplastic lesion gastric adenocarcinoma accounted for 14 (20.89%) cases.

In our study diffuse variant out numbered (59.4%) followed by tubular adeno-carcinoma (40.6%), which is similar to study done by Sunitha et al<sup>1</sup> and Qui et al.<sup>16</sup> with incidence of (49.2%) & (43.7%) respectively. The affected age group was 61-70 years with M:F ratio 1:1.2 in our study. However other studies found the affected age group 50-60 years and M:F ratio of 1.3:1.<sup>5</sup> Adeno- carcinoma was the most common carcinoma in stomach, followed by gastric lymphoma. In our study no cases of gastric lymphoma or GIST were seen.

#### 4.4. Small intestine

There were 78 (15.23%) specimens from small intestine and chronic inflammation was the most common lesion seen in 70 (89.7%) in our study.

There were very few neoplastic lesions (10.25%). In the present study 8 cases of neoplastic lesions, of which 6 (75%) were Brunner gland adenomas /hyperplasia and 2 (25%) were malignant lesions. One each of MALT (mucosa associated T cell lymphoma) and adenocarcinoma of periampullary region.

This study shows lowest incidence of small intestinal malignant lesions and the common affected age group was 51-60 years, which is comparable to studies reported by Sabharwal et al<sup>13</sup> & Prabhakar et al.<sup>14</sup>

#### 4.5. Gall bladder

There were 175 (34.17%) specimen gall bladder with most common pathology being chronic cholecystitis (100%), followed by associated cholelithiasis (80%) There were no neoplastic lesions in our study. Male preponderance with M:F ratio [1.1:1] was seen in our study. These findings are in concordance with studies reported by Prasad et al.<sup>4</sup> Xanthogranulomatous cholecystitis was seen in 5 (2.8%) cases in our study. There were no neoplastic lesions.

#### 4.6. Appendix

Appendix was most commonly affected organ in the present study with 95 (18.55%) cases. Male preponderance with M:F ratio of 4.5:1, which is supported by Aried et al<sup>7</sup> in literature (Table 5). Acute appendicitis (55.3%) was the most common finding followed by chronic appendicitis (20.4%). There were 2 cases (2.1%) of mucin secreting adenocarcinomas of appendix.

#### 4.7. Colo-rectum

In the present study 39(7.61%) specimens were from colorectal region and the most common pathology was that of chronic inflammatory lesions 32(82.05%), followed by 7 (17.9%) neoplastic lesions of which benign polyps accounted for 3 (7.69%) and malignant lesions of Inflammatory bowel disease were seen in 3 case (9.37%) in our stud, and all cases were of Most commonly affected sites in our study was colo-rectum (41.3%) and the age group from 41. In our study there were 3 (7.69%) were adenocarcinoma,<sup>7,17</sup> one (2.5%) was rectal malignant. There were no cases of lymphomas or GIST or leiomyosarcomas in our study. In the present. study, among the neoplastic lesions the M:F ratio was 2.7:1 signifying male.

A study done by Sabharwal et al<sup>13</sup> and Kamal et al<sup>15</sup> supports this trend which is specified by their figures. Gastrointestinal cancers account for about 20% of estimated new cancer cases and 15% estimated mortality worldwide.<sup>18</sup> Organ wise distribution of malignancy in our study signifies the most common organ involved were esophagus 63% with the least common being tumors involving small intestine (3.07%), which is not in accordance with the study done by SunithaBamanikar et al.<sup>1</sup> Sabharwal et al.<sup>13</sup> Malignant lesions of stomach was (15.3%) and colorectal was 7.7% in our study.

#### 5. Conclusion

Our study summarizes variety of lesions encountered in our center and the inflammatory lesions are the most common lesions encountered on histopathological examination.

Histopathological evaluation plays important role in the final diagnosis, management and follow up of neoplastic and

inflammatory conditions.

GI endoscopic representative biopsy is a relatively simple and minimally invasive procedure for histopathological and immunohistochemical evaluation.

Clinicopathological correlation of these lesions will be of immense help in early diagnosis and therapeutic measures and prognosis.

## 6. Source of Funding

None.

## 7. Conflict of Interest

None.

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