# CLINICOPATHOLOGICAL STUDY OF SURGICALLY RESECTED SPECIMENS OF LARGE BOWEL

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**KEYWORDS**

**TNM, malignant tumors, neoplasms, ulcers**

**ABSTRACT**

**Introduction:**The large intestine and anal canal are sites for various diseases, including infections, vascular disorders, ulcers, and neoplasms. Early diagnosis is crucial for proper treatment, and endoscopy is the most common procedure. Colorectal carcinoma is the third most common cancer in the US and the third leading cause of cancer-related deaths. Pathologists play a central role in evaluating prognostic factors and staging, and removing adenomas can decrease the incidence of colorectal cancer. Age is the most important risk factor for colorectal cancer.**Aims:**The study aims to analyze large bowel resection specimens in a tertiary care hospital's histopathology section, examining histological patterns, distribution, and categorizing lesions into non-neoplastic and neoplastic types.
**Methodology:** The study examines the anatomical relationships between the colorectum and visceral peritoneum in colon cancer resection, emphasizing the need for adjuvant radiotherapy. It discusses standard surgical techniques, clinical history, and neo-adjuvant treatment. Accurate TNM staging and margin assessment are crucial for prognosis and post-operative management.**Results:**The study examined 176 surgical specimens from July 2022 to June 2024, revealing a majority of cases in males aged 31-40, with inflammatory lesions, benign cases, and malignant tumors.**Discussion:**The study reveals that the majority of lesions in large intestines are inflammatory, with malignant tumors being the most common, primarily in males aged 31-40.**Conclusion:** Research shows large intestine lesions mainly occur in males aged 30-60, with histopathological examination crucial for diagnosis, prognosis, and classification of tumors and inflammatory infiltrates.

## INTRODUCTION

The large intestine and anal canal are sites for various non-neoplastic and neoplastic diseases, including infections, vascular disorders, ulcers, inflammatory conditions, and neoplasms. Early diagnosis is crucial to avoid further consequences and for proper treatment. Endoscopy is the most commonly performed procedure in detecting premalignant and malignant lesions of the gastrointestinal tract.[1]
Colorectal carcinoma is the third most common cancer in the United States and the third leading cause of cancer-related deaths. In 2011, an estimated 141,210 new cases of colorectal carcinoma were diagnosed in the United States, with 49,380 deaths. Adenocarcinoma is the

most common malignant tumor of rectum and colon, and its incidence is lower in India than colon cancer.[2,3]

Evaluation of prognostic factors and staging is important in a case of carcinoma colon, as they help select patients who might benefit from adjuvant therapy. Pathologists play a central role in analyzing histologic features suggestive of microsatellite instability (MSI), selecting appropriate tissue sections for MSI testing, and interpreting the results of these important therapeutic and prognostic tests.[4]

More than 90% of colorectal carcinomas are adenocarcinomas originating from epithelial cells of the colorectal mucosa. Conventional adenocarcinoma is characterized by glandular formation, while moderately differentiated adenocarcinoma shows 50-95% gland formation. Most colorectal adenocarcinomas arise from adenomas, and removal of adenomas has been shown to be effective in decreasing the incidence of colorectal cancer.[5-7]

Age is the most important risk factor for colorectal cancer, with 90% of cases diagnosed between 30 to 60 years. Detecting early-stage cancers can reduce mortality and improve patient outcomes.

## AIM & OBJECTIVES

AIM:To study the occurrence of various lesions in the large bowel resection specimens received in histopathology section of a tertiary care hospital.

OBJECTIVES:

- To Study various histological patterns, distribution of these lesions with reference to anatomic locations and age and sex distribution.
- To categorize the lesions into non-neoplastic and neoplastic, neoplastic being further divided into benign and malignant.

## MATERIAL AND METHODS:

The current study was performed in a tertiary medical care center for a duration of two years, from July 2022 to June 2024.

- **Inclusion criteria:** The selection criteria encompass all instances of lesions in colectomy specimens that were sectioned and histopathologically investigated in the pathology department of a tertiary care institution.
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**STUDY:** A cross-sectional research was conducted over a two-year period from July 2022 to June 2024. The cases included were colectomy specimens obtained at the Department of Pathology of a tertiary medical care center.

The clinical information were gathered from patients for the cross-sectional investigation, encompassing instances reported from July 2022 to June 2024.

Tissues were handled in the Department of Pathology. The sections were stained with hematoxylin and eosin. Periodic acid Schiff (PAS) was performed when needed.

The visceral peritoneum is a complex structure that envelops the rectum, forming the Douglas pouch in females and the rectovesical pouch in males. It reflects onto the uterus and urinary bladder, creating the Douglas pouch and rectovesical pouch respectively. The rectum's top part is covered by peritoneal covering, while its posterior surface is devoid. The middle third is covered by the peritoneum, leaving lateral and posterior surfaces exposed.[8]

Clinical significance of the anatomical relationships between the colorectum and the visceral peritoneum :Rectal tumours are generally worse than those in other parts of the colon, especially those located below the anterior peritoneal reflection. These tumours require adjuvant radiotherapy and are more likely to recur. Non-peritonealized surfaces (NPS) are surgical resection margins, while serosal surfaces are natural barriers formed by mesothelial

cells and their basement membrane. When the tumor breaches serum, it gains access to the peritoneal cavity, leading to a higher prognosis. The involvement of serosa by the tumor significantly worsens the prognosis, making serosa and NPS two conceptually different entities with different management strategies.[8]

Surgical specimens of the colorectum range from resection of a polyp to total proctocolectomy, depending on the tumor site, number of tumors, and background abnormalities. Commonly received specimens include polypectomy, right hemicolectomy, left hemi-colectomy, transverse, descending, and sigmoid colectomy. Anterior resection (AR) is done for high rectal tumors where preservation of anal sphincter is possible. Low or ultra-low anterior resections (AR) are done for low rectal tumors where anal sphincter can be saved but the distal margin may be very close to the tumor. In-operative assessment of distal margin is often required using frozen sections. Abdomino-perineal resection (APR) involves en block resection of the rectosigmoid, rectum, and anus, along with surrounding sigmoid mesentery, mesorectum, and perianal soft tissues. APR is done for low rectal and anal canal tumors where anal sphincter cannot be saved. Total mesorectal excision is the current standard surgical technique for both low AR and APR, with the oncology principles in handling both specimens being the same. Total proctocolectomy is done for cases of Familial adenomatous polyposis syndrome.

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Abdomino-perineal resection (APR) involves en block resection of the rectosigmoid, rectum, and anus along with the surrounding sigmoid mesentery, mesorectum, and perianal soft tissues. APR is done for low rectal and anal canal tumors where anal sphincter cannot be saved, but it is considerably morbid as it results in loss of anal sphincter and hence permanent colostomy. Total mesorectal excision is the current standard surgical technique for both low AR and APR, and the oncology principles in handling both specimens are the same.

To receive a specimen, surgeons should receive unopened specimens in 10% formalin along with proper clinical history. They should refrain from opening the specimen, as this practice could result in distorting important structures such as serosa or non-peritonealized surface with respect to the tumour. If the specimen is to be dealt with in the frozen section for assessment of surgical margins, tumour should be exposed minimally and just enough to determine the distance of the closest margin from the tumour.

History of neo-adjuvant treatment should always be sought, as in some cases, the tumour disappears completely following neo-adjuvant treatment. It is important to know the pre-operative biopsy diagnosis and precise site of tumor before initiation of neo-adjuvant treatment in such situations.

Notice the nature of the surgical procedure, record the length of the entire specimen, palpate the tumour from the outer aspect of the specimen, assess the quality of total mesorectal excision (TME), photograph the specimen from both aspects for records purpose, look for the presence of tumour site perforation before inking, paint the non-peritonealised surface with ink with special reinforcement to the NPS related to the tumour, open the specimen from the anterior aspect starting from either ends of the tumour till 1 cm above and below the tumour,

note the distances of both longitudinal resection margins from the tumour, and record the location of the tumor with relation to anterior peritoneal reflection in rectosigmoid, AR, and APR specimens.

The location of a tumor in the rectum is determined by the anterior peritoneal reflection seen in the surgical specimen. Tumors located above or below this reflection are related to both the serosa and non-peritonealized surface, while those below the anterior peritoneal reflection are not related to the peritoneum and are entirely related to NPS/CRM. It is important to correlate the actual size with imaging findings, especially in patients who have received neo-adjuvant chemotherapy and/or radiotherapy. [8]

To sample the tumor, cut serial slices of not more than 5 mm thick of the segment containing tumour in a transverse manner starting from 1 cm above and ending 1cm below the limits of the tumour. Place the circular intact slices sequentially, one below the other. This method ensures maximal exposure of tumour surface area. In case of rectal tumours, these circular slices would show inked cauterized NPS on posterior and lateral aspects and non-inked shiny serosa on aspect. Document the quadrant (anterior/posterior/circ-ferential) of bowel involved by the tumour at this stage. Examine each slice carefully from both sides.[8]

Identify the deepest invasive parts of the tumour with respect to both serosa and NPS/CRM (if applicable). Sample 4 or 5 sections of tumour each containing the most relevant anatomical surface (serosa and/or NPS/CRM). Document the distance of the tumour from NPS and serosa, respectively. If needed, a large section can be divided into two and put in different blocks with appropriate labeling.18

Accurate TNM staging and margin assessment are crucial for accurate prognosis and appropriate post-operative management of the patient. Judgment of the pathologist in deciding which parts of a tumour are sampled is crucial and ultimately reflects on the TNM staging. Involvement of the NPS (CRM) puts a patient at a high risk of local recurrence, therefore, adjuvant radiotherapy with or without chemotherapy is generally administered, which is toxic and costly but likely to reduce local relapse.

Lymph nodal dissection in colorectal carcinoma involves not dissected off the specimen 'before' tumour sampling to avoid disruption of serosa and NPS. Lymph nodes present in the sections taken for rumour are included in situ without dissection. Transverse setioning should start from the vascular tie and be continued downwards till the first node is found (apical node).[8]

In specimens with good quality total mesorectal excision, pathologist's skill remains the only 'alterable' factor determining lymph nodal yield. Low yield of nodes, especially in low rectal tumours and patients who have received neo-adjuvant chemo radiotherapy, is a perpetual difficulty faced by grossing pathologists.

The text emphasizes the importance of accurate lymph nodal yield for optimal staging in colorectal tumors. Patients with node-positive disease are categorized as stage III and have a worse prognosis, necessitating adjuvant chemotherapy. A minimum of 12 lymph nodes should be examined to avoid tumour under-staging, and even a single positive nade may warrant adjuvant chemotherapy.

The bowel segment should also be examined for abnormalities like synchronous carcinoma, features of inflammatory bowel disease, polyps, and mesorectum/peri-colonic fat. Extramural

venous emboli outside the bowel wall are an adverse prognostic feature in colorectal tumors.

The surgical procedure involves receiving unopened specimens in formalin, checking specimen identification, noting the nature of the surgical procedure, recording the length of the specimen, palpating the tumor from the outer aspect, assessing the quality of total mesorectal excision (TME), photographing the specimen, looking for tumor site perforation before inking, painting the non-peritonealized surface with ink with special reinforcement to the NPS related to the tumor, opening the specimen from the anterior aspect, noting the distances of both longitudinal resection margins from the tumour, and recording the location of the tumor with relation to anterior peritoneal reflection.[8]

Sections to be taken include four or five sections of the tumour, all inclusive of serosa and/or CRM, all lymph nodes dissected off the specimen, longitudinal mucosal resection margins, adjacent mucosa, and samples from any other grossly abnormal area. All specimens were fixed in buffered 10% formalin, and the technique of processing involved dehydration, Xylene, and paraffin impregnation at 60 degrees Celsius.

Tissues were embedded in paraffin wax, labeled, and processed after trimming excess paraffin. Sections were cut at a microtome setting of 4 microns, floated on a water bath at 60 degrees Celsius temperature, and mounted on a slide using a thin layer of glycerol egg albumin as an adhesive. Light microscopy was used to study the sections, with one slide from each block routinely stained with H and E to arrive at diagnosis.

The preparation of hematoxylin crystals and eosin involves dissolving hematoxylin and alum salts in water, boiling them, and adding mercuric oxide. The stain is ready to use when it cools. The addition of glacial acetic acid provides more precise staining for nuclei. Eosin powder is dissolved in distilled water and a large glass of thymol or 0.25 ml of 40% formaldehyde is added to prevent muscle growth.

H and E staining methods involve deparaffinizing with xylene, using absolute ethyl alcohol, and washing with tap water. Harris hematoxylin is diluted with 1% hydrochloric acid and washed in running tap water. The stain is then rinsed in 80% to 90% alcohol and absolute alcohol, and clear in xylene. Mounted in DPX, the results show nuclei as blue to blue black, and cytoplasm and other substances as pink.

Special stains, such as periodic acid Schiff and dihydroxy-phenylalanine, are used as needed. The periodic acid Schiff Principle demonstrates glycogen and neutral mucosubstances. Schiff reagents include sulphurous acid, 10% sodium/ potassium metabisulphite, 1N hydrochloric acid, and distilled water. The staining procedure involves dewaxing the section, oxidizing with 1% aqueous periodic acid, washing well with distilled water, covering with Schiff reagents, and washing for 2 minutes in freshly prepared sulphite. The results show PAS positive substances as magenta pink and nuclei as blue.

## OBSERVATIONS & RESULTS

The present study was carried out for a total period of two years from July 2022 to June 2024., the histopathological features of **large bowel** lesions **were analyzed.**
The study received 176 surgical specimens, including 100 sigmoid colectomy, 50 left hemi colectomy, and 26 right hemi colectomy, out of a total of 176 resected surgical specimens.

| **Nature of specimen** | **Number** | **Percentage** |
|---|---|---|
| Right hemi-colectomy | 26 | 14.77 |

| | | |
|---|---|---|
| Left hemi-colectomy | 50 | 28.40 |
| Sigmoid colectomy | 100 | 56.81 |
| **Total** | 176 | 100 |

**Table No. 1 – Distribution of cases according to Nature of specimens**

he study revealed that the majority of lesions were found in patients aged 31-40, with 26.13% of cases being in this age group, with the youngest patient being a 28-week-old neonate.

| Age group | Total | |
|---|---|---|
| | Number | Percentage (%) |
| 1 day-10yrs | 18 | 10.22 |
| 11-20 yrs | 04 | 2.27 |
| 21-30 yrs | 24 | 13.63 |
| 31-40 yrs | 46 | 26.13 |
| 41-50 yrs | 25 | 14.20 |
| 51-60 yrs | 33 | 18.75 |
| 61-70 yrs | 18 | 10.22 |
| 71-80 yrs | 04 | 2.27 |
| 81-90 yrs | 03 | 1.70 |
| 91-100 yrs | 01 | 0.60 |
| Total | 176 | 100 |

**Table No.2-Age wise distribution of lesions of Large intestine**

The current study indicates that, out of 176 instances, the majority, specifically 132 cases (75%), were male, whereas 44 cases (25%) were female. The current investigation observed a male predominance.

| **Gender** | **Number of cases** | **Percentage** |
|---|---|---|
| **Males** | **132** | **75%** |
| **Females** | **44** | **25%** |
| **Total** | **176** | **100%** |

**Table 3- Sex wise distribution of cases of large intestinal lesion**

Out of 176 patients, 51.13% experienced abdominal pain, 28.40% vomiting, 9.09% PR bleeding, and 5.68% diarrhea. Melena and abdominal distension were less common, with 4 cases (2.27%) and 6 cases (3.40%) respectively.

| **ClinicalFeatures** | **Numberofcases** | **Percentage** |
|---|---|---|
| AbdominalPain | 90 | 51.13% |
| Vomiting | 50 | 28.40% |
| PRbleeding | 16 | 9.09% |
| Melena | 4 | 2.27% |
| Abdominaldistension | 6 | 3.40% |
| Diarrhoea | 10 | 5.68% |
| total | 176 | 100% |

**Table 4-Distribution of cases according to Clinical presentations of patients**

Out of 176 cases, inflammatory lesions were more common (68.18%), followed by benign cases (6.81%), and malignant tumors (21.59%). Benign and congenital lesions were less common. Six cases of Hirschsprung disease were found in the congenital group, with four occurring in the neonatal period and two after the first month of life.

| **Type of lesion** | **No. of cases** | **Percentage** |
|---|---|---|
| **Congenital** | **06** | **3.40** |
| **Inflammatory** | **120** | **68.18** |

| | | |
|---|---|---|
| **Benign** | **12** | **6.81** |
| **Malignant** | **38** | **21.59** |
| **Total** | **176** | **100** |

**Table No. 5 - Distribution of cases according to various types of lesions present in Large intestine**

The study found that congenital lesions were more common in the 1 day - 10 years age group (66.66%), followed by 11 - 20 years (33.33%) and 31-40 years (27.50%) age groups. Inflammatory lesions were more common in the 31-40 years age group (27.50%). Benign tumors were more common in the 61-70 years age group (33.33%), followed by the 31-40 years age group (25%). Malignant tumors were more common in the 41-60 years age group (55.25%).

| Age( Yrs) | Congenital | | Inflammatory | | Benign | | Malignant | |
|---|---|---|---|---|---|---|---|---|
| | No | % | No | % | No | % | No | % |
| 1day–10yrs | 04 | 66.66 | 01 | 0.83 | 01 | 8.33 | 00 | 0 |
| 11–20yrs | 02 | 33.33 | 03 | 2.50 | 00 | 00 | 00 | 0 |
| 21–30yrs | 00 | 00 | 24 | 20.6 | 02 | 16.66 | 00 | 0 |
| 31–40yrs | 00 | 00 | 33 | 27.50 | 03 | 25 | 06 | 15.78 |
| 41–50yrs | 00 | 00 | 20 | 16.66 | 00 | 00 | 10 | 26.31 |
| 51–60yrs | 00 | 00 | 26 | 20 | 02 | 16.66 | 11 | 28.94 |
| 61–70yrs | 00 | 00 | 09 | 7.50 | 04 | 33.33 | 07 | 18.42 |
| 71–80yrs | 00 | 00 | 02 | 1.66 | 00 | 00 | 02 | 5.26 |
| 81–90yrs | 00 | 00 | 02 | 1.66 | 00 | 00 | 01 | 2.63 |
| 91–100yrs | 00 | 00 | 00 | 00 | 00 | 00 | 01 | 2.63 |
| **Total** | **06** | **100** | **120** | **100** | **12** | **100** | **38** | **100** |

**Table No. 6– distribution of lesions of large intestine according to age**

The study found that out of 176 cases, 124 (70.45%) males and 52 (29.54%) females were affected, with 4.03% having congenital lesions, 62.09% having inflammatory lesions, and 76.69% having benign lesions. Male predominance was observed in large bowel lesions, with 27.41% and 7.69% having malignant lesions.

| Lesions | Sex | |
|---|---|---|
| | Male | Female |
| **Congenital** | **05 (4.03%)** | **01 (1.92%)** |
| **Inflammatory** | **77 (62.09%)** | **43 (82.69%)** |
| **Benign** | **08 (6.45%)** | **4 (7.69%)** |
| **Malignant** | **34 (27.41%)** | **4 (7.69%)** |
| **Total** | **124 (70.45%)** | **52 (29.54%)** |

**Table No. 7 – distribution of lesions of Large intestine according to gender**

The study reveals that Hirschsprung disease is predominantly seen in males during the neonatal period (1-28 days), with only 16.66% affected in females, and 16.66% in males between 1 month and 12 months.

| Age at presentation | Males | Females |
|---|---|---|

| | No of cases | % | No of cases | % |
|---|---|---|---|---|
| **1-28 days** | **04** | **66.66** | **01** | **16.66** |
| **1 month – 12 months.** | **01** | **16.66** | **00** | **00** |

**Table No. 8 - age and sex wise distribution of congenital lesions**

The study found that hemorrhagic necrotising enterocolitis of ascending colon was the most common indication for hemicolectomy, followed by perforation, intestinal obstruction, and intussusception in 40 (33.33%) out of 120 cases.

| **Clinical Features** | **Number of cases** | **Percentage** |
|---|---|---|
| Gangrene of sigmoid colon | 06 | 5.00% |
| Intestinal obstruction | 24 | 20.00% |
| Perforation of ascending colon | 30 | 25.00% |
| Volvulus sigmoid colon | 10 | 8.33% |
| Hemorrhagic NEC of ascending colon | 40 | 33.33% |
| Intusuception | 10 | 8.33% |
| Total | 120 | 100% |

**Table-9- Distribution of cases according to indication for hemicolectomy in inflammatory lesions**

The current study indicates that among 50 cases of neoplastic lesions, the majority, namely 20 cases (40%), exhibited adhesions; 18 cases (36%) presented with growth; 4 cases (8%) were attributed to perforation; and 8 cases (16%) were due to stricture.

| **Typeoflesion** | **No.ofcases** | **Percentage** |
|---|---|---|
| Growth | 18 | 36 |
| Adhesions | 20 | 40 |
| Perforation | 04 | 08 |
| Stricture | 08 | 16 |
| **Total** | **50** | **100** |

**Table No. 10 - Distribution of cases according to indication for hemicolectomy in Neoplastic lesions**

The study found that acute self-limiting colitis was the most common inflammatory lesion in 120 cases, followed by ischemic colitis with 42 cases, and less frequently Crohn's disease, Tuberculous typhlitis, Lymphocytic colitis, and Collagenous colitis.

| **Histopathological type** | **No. of cases** | **Percentage(%)** |
|---|---|---|
| Hemorrhagic Necrosis | 06 | 5.00 |
| Crohns disease | 02 | 1.66 |
| Ischemic colitis | 42 | 35.00 |
| Lymphocytic colitis | 02 | 1.66 |
| Tuberculous typhlitis | 06 | 5.00 |
| Acute self limiting colitis | 60 | 50.00 |
| Collagenous colitis | 02 | 1.66 |
| **Total** | **120** | **100** |

**Table No. 11 - Distribution of Inflammatory lesions of Large intestine according to histopathological diagnosis**

The study found that tubular adenomas were the predominant large intestine adenomas in 12 patients, accounting for 75% of cases, followed by tubulovillous adenomas in 2 cases.

| **Histopathologicaltype** | **Number** | **Percentage** |
|---|---|---|
| Tubularadenoma | 09 | 75% |
| Villousadenoma | 01 | 8.33% |
| Tubulovillousadenoma | 02 | 16.66% |
| **Total** | **12** | **100** |

**Table No. 12 – Distribution of cases of Benign tumors of Large intestine (adenomas) according to histopathological diagnosis**

Based on morphological characteristics, of the 38 neoplastic cases, 38 (76.00%) exhibited polypoidal development, whereas 12 (24%) had ulcerative growth.

| **Type of growth** | **No. of cases** | **Percentage** |
|---|---|---|
| Polypoid | 38 | 76 % |
| Ulcerative | 12 | 24 % |
| Total | 50 | 100% |

**Table 13- Indications for hemicolectomy in neoplastic lesions of Large intestine**

The study examined 38 malignant tumors in the large intestine, with the rectum being the most common site (42.10%), followed by the sigmoid colon (24.94%). Other sites included the caecum (7.89%), ascending colon (2.63%), transverse colon (2.63%), descending colon (7.89%), and anal canal (7.80%).

| **Site** | **Number** | **Percentage** |
|---|---|---|
| Caecum | 03 | 7.89 |
| Ascending colon | 01 | 2.63 |
| Transverse colon | 01 | 2.63 |
| Descending colon | 03 | 7.89 |
| Sigmoid colon | 11 | 28.94 |
| Rectum | 16 | 42.10 |
| Anal canal | 03 | 7.80 |
| **Total** | **38** | **100** |

**Table No. 14 - Site distribution of cases according to site of malignant tumors of Large intestine**

The study found that polypoidal growth was the predominant growth pattern in 76% of malignant tumors of the large intestine, followed by ulcero-infiltrative development in 24% of cases.

| **Type of growth** | **No.** | **Percentage** |
|---|---|---|
| Polypoid | 38 | 76% |
| Ulcero-infiltrative | 12 | 24% |
| Total | 50 | 100% |

**Table No. 15 - Pattern of growth in Neoplastic Lesions of Large intestine**

This study demonstrates Of the 38 instances of malignant tumors in the large intestine, the majority, 27 cases, were adenocarcinomas, constituting 71.05% of the total.

Adenocarcinomas were then assessed, revealing that 52.32% were moderately differentiated, whereas highly differentiated and poorly differentiated adenocarcinomas comprised 6 instances (16.04%) and 1 case (2.63%), respectively.

Mucinous carcinoma comprises 4 instances (10.52%), signet ring cell carcinoma 1 case (2.63%), neuroendocrine tumor 2 cases (5.26%), malignant melanoma 2 cases (5.26%), and both lymphoma and squamous cell carcinoma account for 1 case (2.63%) each.

| **Histopathological Type** | | **Number** | **Percentage** |
|---|---|---|---|
| Adenocarcinoma | Grade | | |
| | Well differentiated | 06 | 16.04 |
| | Moderately differentiated | 20 | 52.32 |
| | Poorly differentiated | 01 | 2.63 |
| Mucinous carcinoma | | 04 | 10.52 |
| Signet ring carcinoma | | 01 | 2.63 |
| Neuroendocrine tumor | | 02 | 5.26 |
| Malignant melanoma | | 02 | 5.26 |
| Lymphoma | | 01 | 2.63 |
| Squamous cell carcinoma | | 01 | 2.63 |
| **Total** | | **38** | **100** |

**Table No. 16 – Distribution of cases of malignant tumors of large intestine according to histopathological diagnosis**

The study shows that 61% of 27 adenocarcinoma cases were classified as stage B2, 65% of 4 mucinous cases were also in stage B2, and one Signet ring cancer case was at stage C2.

| **Staging** | **Adenocarcinoma** | **Mucinous Adenocarcinoma** | **Signet ring carcinoma** | **Squamous Cell carcinoma** |
|---|---|---|---|---|
| A | 19.00 % | --- | --- | --- |
| B1 | --- | 16.67 % | --- | --- |
| B2 | 20.00 % | --- | --- | --- |
| C1 | --- | 16.67 % | --- | --- |
| C2 | 63.00 % | 65.33 % | 70 % | 66 % |
| D | --- | --- | --- | --- |

**Table No- 17. Distribution of malignant cases according to Astler- Coller classification /Dukes**

## DISCUSSION

This study analysed 176 surgical specimens, with the majority of lesions observed in patients aged 31-40 years. The majority were male (75%), with 132 cases (75% male) and 44 cases (25% female). Most patients experienced stomach discomfort (51.13%), vomiting (24.40%), PR bleeding (9.09%), and diarrhoea (5.68%). Melena was detected in 4 instances (2.27%) and abdominal distension in 6 cases (3.40%), both less frequently noted in the current research.[9,10]

Inflammatory lesions were prevalent in 120 instances (68.18%), with benign instances constituting 6.81% and malignant tumours 21.59%. Hirschsprung disease was observed in six instances (66.66%), with four occurrences (66.66%) occurring in the neonatal period (1-28 days) among men. The study also found that 80% of Hirschsprung disease cases occur in

males, diagnosed within the first year of birth and 10% presenting in adulthood.[11-14]

The histology of Hirschsprung disease reveals abnormally diminutive ganglion cells in the transitional region of the afflicted colon. Hemicolectomy was most common for haemorrhagic necrotizing enterocolitis of the ascending colon (33.33%), followed by perforation (25%), intestinal obstruction (20%), and intussusception (8.33%). Neoplastic lesions were present in 20 cases (40%), 36% presented with blockage, 8 cases (8%) resulted from perforation, and 16% were due to stricture.[14-18]

The findings align with previous research on Hirschsprung disease, which is characterized by abdominal distension and a surge in cases during the newborn era.107
The study reveals that the most common inflammatory lesion in the large intestine is acute self-limiting colitis, accounting for 60 cases (50.00%). Ischemic colitis, Crohn's disease, Tuberculous typhlitis, Lymphocytic colitis, and collagenous colitis are less commonly observed. Acute self-limiting colitis presents with abdominal pain, diarrhea, and per rectal bleeding, with stool cultures often being bacteriologically negative. Ischemic colitis has symptoms such as abdominal pain, constipation, and bleeding per rectum.[11,17,18,14]

The most common adenomas of the large intestine are tubular adenoma (75%) and tubulovillous adenoma (16.66%). In southern India, adenomas are most common in the age group of 23-82 years with a M:F ratio of 2.5:1. Severe dysplasia is found in 12% of tubular adenomas and 43% of villous adenomas.

Out of 50 neoplastic cases, 76% had polypoidal growth and 24% had ulcerative growth. Out of 38 cases of malignant tumors of the large intestine, the most common sites were the rectum (42.10%), sigmoid colon (24.94%), caecum (7.89%), ascending colon (2.63%), transverse colon (2.63%), descending colon (7.89%), and anal canal (7.80%).19

Among the malignant tumors, 27 cases were adenocarcinomas (71.05%), with 52.32% being moderately differentiated. Mucinous carcinoma accounts for 10.52%, signet ring cell carcinoma 1 case (2.63%), neuroendocrine tumor 2 cases (5.26%), malignant melanoma 2 cases (5.26%), lymphoma, and squamous cell carcinoma accounting for 2.63%) each.20

The present study aligns with previous studies by Sulegaon et al [11] (2015) and Jagtap S et al [20] (2016), which found that adenocarcinoma is the most common tumor type in large intestines. The peak age of malignant tumors was found to be between 30-70 years (52.08%), with a higher incidence in men (70.45%) than women (29.54%). The site distribution was similar to previous studies, with distal colon being the most common site (57%).

The histological type of malignant colorectal tumors was moderately differentiated adenocarcinoma, as reported by Sulegaon et al [11] (2015) and Jagtap S et al [20] (2016). Most tumors were of C stage according to Astler Coller modification of Dukes staging, while Rich et al found B1 and B2 stages in the majority of patients. Mucinous carcinoma was more common in male patients (60%), with an average age span of 30-70 years.

Signet ring cell carcinoma was 2.63% in the present study, occurring in the age range of 30 to 60 years with a mean age of 40. Male predominance was found in this study (66.66%). Malignant melanoma had an age incidence of 30-60 years, with a male predominance. Malignant lymphoma occurred in 70-70 year old males, while neuroendocrine tumors were found in 67-70 year old males with a male predominance of 53.57%. Squamous cell carcinoma was found in 50-65 year old males, with all tumors found in the anal canal.[20]

In conclusion, the present study provides valuable insights into the prevalence and types of malignant tumors in large intestines, with a focus on the most common types and their associated sex and age groups.

## SUMMARY

A histopathological study was conducted at a tertiary medical center's Department of Pathology from July 2022 to June 2024, analyzing 176 surgically resected large bowel specimens. The majority of lesions were present in the age group of 31-60 years, with a mean age of presentation of 40 years. The majority of cases were male, with abdominal pain being the most consistent symptom. Inflammatory lesions were the most common, accounting for 68.18% of the cases. Adhesions were the most common indications for hemicolectomy in neoplastic lesions. Tubular adenomas were the most common lesion in benign tumors of the large intestine. Polypoidal lesion was the commonest morphological appearance for neoplastic lesions, indicated for hemicolectomy. Mucinous carcinoma was the second most common malignant tumor, with a mean age of presentation of 50 years. Signet ring cell carcinoma was predominantly found in the age group of 30-50 years, with male predominance. There were two cases of malignant melanoma, two cases of malignant lymphoma, two cases of neuroendocrine tumor, and one case of squamous cell carcinoma in a 62-year-old male.

## CONCLUSIONS

Research conducted at a tertiary medical facility revealed that lesions of the large intestine predominantly occur in males aged 30 to 60 years. The range of lesions include congenital, inflammatory, benign, and malignant neoplastic types. Histopathological examination is essential for determining pathology prognostic variables, tumor classification, grade, margins, vascular invasion, and inflammatory infiltrates. Consequently, every surgically excised large bowel material must be subjected to histological analysis.

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