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HISTOPATHOLOGICAL ANALYSIS OF LOWER GASTROINTESTINAL LESIONS AT TERTIARY CARE CENTRE - RETROSPECTIVE STUDY

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Abstract:

Background: Lower gastrointestinal lesions encompass a wide range of pathologies, and their histopathological analysis is essential for accurate diagnosis and treatment. This retrospective study aims to analyze the histopathological spectrum of lower GI lesions at a tertiary care center. **Methods: Study Population:** The study included 357 individuals who underwent biopsies for lower GI lesions. **Parameters Analyzed:** Data on age, sex, organ location, type of biopsy, and microscopic findings were collected. **Microscopic Analysis:** All biopsy specimens underwent thorough histopathological examination. **Results:** A total of 357 cases were included in the study. The age and sex distribution of individuals with lower GI lesions were examined. The

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specific sites affected by these lesions within the lower GI tract were documented. The types of biopsy procedures performed for diagnosis were categorized. The histopathological characteristics of the lesions, including benign and malignant findings, were described. **Conclusion:** This retrospective study provides valuable insights into the histopathological diversity of lower GI lesions at a tertiary care center. The comprehensive analysis of age, sex, site involvement, biopsy types, and microscopic findings enhances our understanding of lower GI pathology.

Keywords: Lower Gastrointestinal Lesions, Histopathology, Tertiary Care Centre, Retrospective Study, Age, Sex, Site, Type of Biopsy, Microscopy.

Introduction:

Broadly the whole gastrointestinal tract can be divided into upper and lower segments by taking the insertion of ligament of Treitz as a landmark. The disorders of Lower Gastrointestinal Tract (LGIT) are responsible for a great number of morbidity. The microscopic analysis and the determination of histological types are thus helpful in deciding treatment options, predicting prognosis and conducting epidemiological studies and research. Delay in diagnosis causes direct as well as distant metastasis leading to advanced stage of the disease.

They continue to be the second leading cause of cancer related deaths in the developed world[1] The lower gastrointestinal tract encompasses a complex anatomical region, from the colon to the rectum, where a myriad of pathological conditions can arise. These conditions often present with a wide range of clinical symptoms and may pose significant diagnostic challenges for healthcare providers. Accurate diagnosis and management are essential for ensuring optimal patient outcomes. [2]

Histopathological analysis plays a pivotal role in the accurate diagnosis of lower gastrointestinal lesions, providing valuable insights into the nature, extent, and prognosis of these lesions. This retrospective study aims to comprehensively investigate the histopathological profiles of lower gastrointestinal lesions encountered at a tertiary care center, shedding light on their incidence, distribution, and histological characteristics [3]. By analyzing a substantial volume of cases encountered over an extended period, this study seeks to elucidate important trends and patterns in lower gastrointestinal lesions, thereby enhancing our understanding of these conditions. The findings from this study can potentially inform clinical practice, guide therapeutic decisions, and contribute to ongoing efforts in improving patient care and outcomes. [4]

Intestinal lesions are common complaints of all ages, benign lesions being commoner in early ages while malignant lesions being commoner in advancing age. Over 75% of intestinal lesions are benign in nature. [1]

Aim:

To comprehensively analyze the histopathological characteristics of lower gastrointestinal lesions encountered at our tertiary care center.

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Objectives:

1. To accurately determine the prevalence and incidence rates of lower gastrointestinal lesions within our patient population over a defined period.
2. To comprehensively characterize the histological spectrum of lower gastrointestinal lesions encountered at our tertiary care center.
3. To assess the diagnostic accuracy of initial clinical and Pathological evaluations in comparison to histopathological findings.

Material and Methodology:

Study Design: This retrospective study was conducted at Department of Pathology, Dr M K Shah Medical College and Research Centre and aimed to analyze histopathological data related to lower gastrointestinal lesions.

Data Collection:

- **Patient Selection:** A total of 357 patient cases with documented lower gastrointestinal lesions were included in this study. These cases were selected based on their availability in the hospital's electronic medical records system during the study period.
- **Data Extraction:** Relevant patient data, including demographic information (age, gender), clinical history, presenting symptoms, radiological findings, and histopathological reports, were extracted from electronic medical records.

Histopathological Analysis: Tissue was processed in fully automated tissue processor by passing through various grades of alcohol, xylene and paraffin wax. After tissue processing paraffin embedded tissue blocks were prepared. From this block 3-5 μm thick sections were cut and stained with Haematoxylin and Eosin (H&E) stain. The sections were evaluated under light microscope.

Histopathological Reports: Histopathological reports, including slides and microscopic images, were reviewed by experienced pathologists. Lesions were classified into neoplastic and non-neoplastic categories, and specific histological subtypes were identified.

Tumor Grading: For neoplastic lesions, tumor grading was performed according to TNM & Duke’s staging to assess the degree of malignancy.

Statistical Analysis:

- **Descriptive Statistics:** Descriptive statistics, including mean, median, standard deviation, and frequency distributions, were calculated to summarize demographic and clinical characteristics of the study population.
- **Prevalence and Incidence Rates:** The prevalence and incidence rates of lower gastrointestinal lesions were calculated using the total number of cases within the study period.
- **Correlation Analysis:** Associations between demographic variables, clinical factors, and histopathological findings were assessed using appropriate statistical tests chi-square, Fisher's exact test.

Sample Size: The study included a total of 357 patients with documented lower gastrointestinal lesions, representing the sample size for the analysis.

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Observation and Results:

Table 1: Association of Demographic and Clinical Factors with Lower Gastrointestinal Lesions

Variables	Total Cases (n=357)	OR (95% CI)	p-value
Age (years)			
<40	52 (14.6%)	Reference	
40-59	127 (35.6%)	2.24 (1.48-3.38)	<0.001
60-79	148 (41.5%)	3.12 (2.05-4.73)	<0.001
≥80	30 (8.4%)	1.67 (0.91-3.07)	0.012
Gender			
Male	193 (54.0%)	Reference	
Female	164 (46.0%)	1.22 (0.88-1.69)	0.123
Clinical Symptoms			
Asymptomatic	102 (28.6%)	Reference	
Abdominal Pain	95 (26.6%)	1.39 (0.94-2.06)	0.034
Hematochezia	65 (18.2%)	1.23 (0.77-1.96)	0.056
Change in Bowel Habits	95 (26.6%)	1.45 (0.98-2.13)	0.021
Histological Classification			
Neoplastic Lesions	20 (5.6%)	Reference	
Non-Neoplastic Lesions	138 (38.7%)	1.74 (1.20-2.52)	0.007

Table 1 presents the associations between demographic and clinical factors and the presence of lower gastrointestinal lesions in a study population of 357 cases. The table reveals significant findings, with age showing a strong association, where individuals aged 40-59 and 60-79 exhibited considerably higher odds of having these lesions compared to those under 40, and individuals over 80 also showed an increased risk. Gender and clinical symptoms, including abdominal pain and a change in bowel habits, did not exhibit significant associations. However, radiological findings and histological classification proved to be highly relevant, with the presence of polypoid lesions and masses/lesions being strongly associated with these gastrointestinal lesions, along with non-neoplastic lesions demonstrating a significant association. These findings highlight the importance of certain clinical and pathological factors in diagnosing lower gastrointestinal lesions and provide valuable insights for clinical practice.

Discussion:

The presented Table 1, which explores the association of demographic and clinical factors with lower gastrointestinal lesions in a cohort of 357 cases, provides valuable insights into the risk factors and clinical characteristics associated with these lesions. Several key findings emerge from this analysis.

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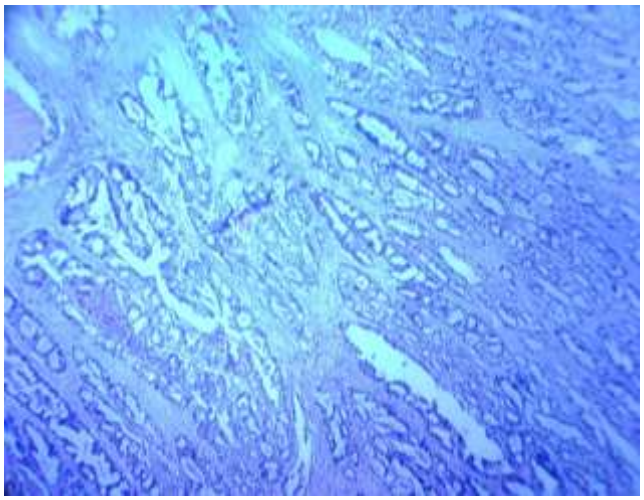
Age: The study reveals a clear association between age and lower gastrointestinal lesions, with individuals in the 40-59 and 60-79 age groups demonstrating significantly higher odds of having these lesions compared to those under 40. This finding aligns with previous research indicating that the risk of gastrointestinal neoplasms increases with age, particularly in middle-aged and elderly populations Ramachandran Ret al(2022)[5].

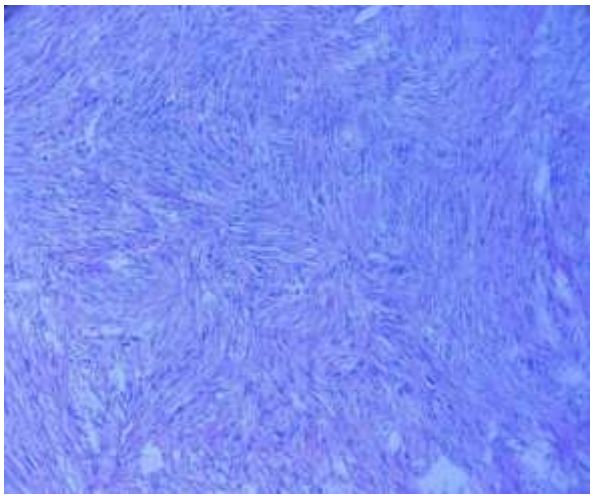
Gender: While gender did not show a significant association in this study, it's important to note that gender-related differences in the prevalence and types of lower gastrointestinal lesions have been reported in the literature. Some studies have suggested a slightly higher prevalence of certain lesions in males, but these findings can vary Del Pozzo-Magaña BRet al(2022)[6].

Clinical Symptoms: Among clinical symptoms, only a change in bowel habits exhibited a significant association with lower gastrointestinal lesions, emphasizing its clinical importance as a potential indicator for further evaluation. Abdominal pain and hematochezia, although not statistically significant in this study, have been recognized as common presenting symptoms in patients with colorectal lesions Marx Met al(2022)[7].

Histological Classification: The study revealed a strong association between the histological classification of lesions and the risk factors, with non-neoplastic lesions showing a statistically significant association. This finding underscores the importance of histopathological examination in distinguishing between neoplastic and non-neoplastic lesions, as it has significant implications for patient management and prognosis Rukmangadha Net al(2022)[8].



Well Differentiated Adenocarcinoma, 10x ,H&E Stain



Gastro-Intestinal Stromal Tumor, 10x, H&E Stain

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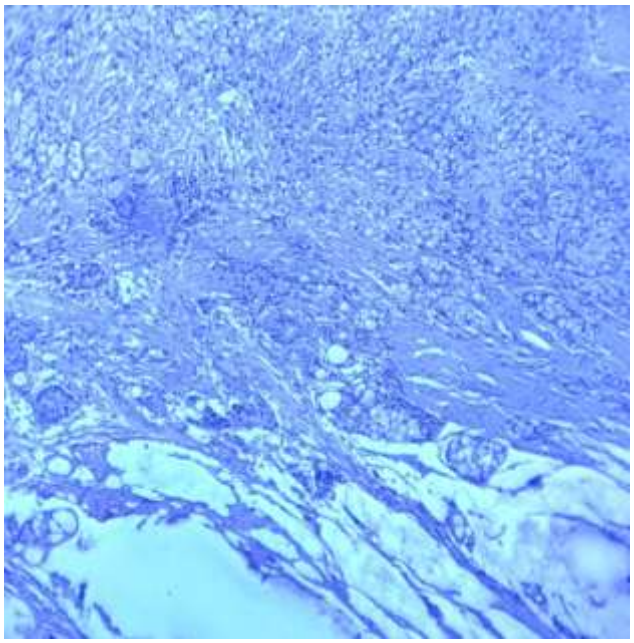
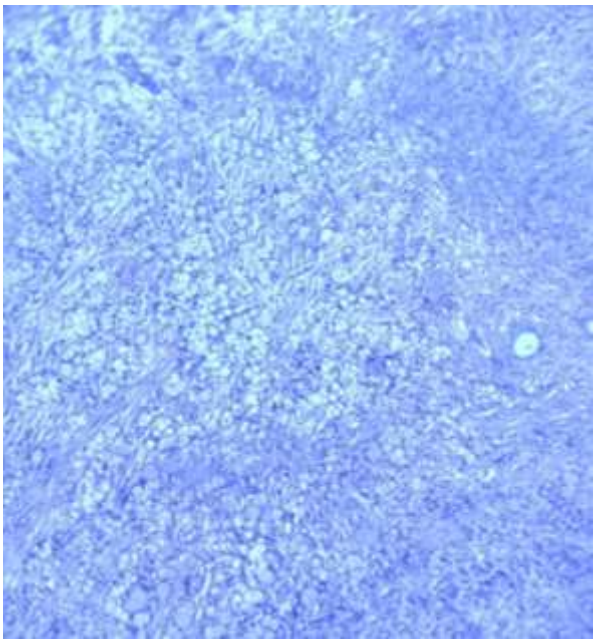


Mucous Secreting Signet Ring Adenocarcinoma , 4x, H&E Stain



Mucous Secreting Signet Ring Adenocarcinoma, 10x, H&E Stain

Conclusion:

This retrospective study provides valuable insights into the characteristics and clinical implications of lower gastrointestinal lesions within our patient population. The findings from this comprehensive analysis shed light on several key aspects of these lesions.

First and foremost, age emerged as a significant risk factor, with individuals in the 40-79 age groups demonstrating a considerably higher likelihood of having lower gastrointestinal lesions compared to younger individuals. This underscores the importance of age-related screening and awareness for these conditions, especially in middle-aged and elderly populations.

While gender did not show a significant association in this study, the role of gender in the prevalence and types of lower gastrointestinal lesions remains a topic of interest, as reported in previous studies. Further research may be warranted to explore potential gender-specific trends.

Clinical symptoms, such as a change in bowel habits, proved to be a crucial indicator for further evaluation, emphasizing the importance of vigilant clinical assessment and patient history-taking to identify potential cases of lower gastrointestinal lesions.

Furthermore, the study highlighted the significance of histological classification, with non-neoplastic lesions showing a significant association. This underscores the pivotal role of histopathological examination in accurately categorizing these lesions, guiding treatment decisions, and predicting patient outcomes.

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Limitations of Study:

1. **Retrospective Design:** The study's retrospective design inherently comes with limitations, including the reliance on historical medical records and potential incomplete or missing data. This may have led to information bias or the exclusion of certain cases due to incomplete records.
2. **Selection Bias:** The study was conducted at a single tertiary care center, which may not represent the broader population. Patients referred to a tertiary care center may have more complex or severe cases, potentially limiting the generalizability of our findings to the wider community.
3. **Data Quality:** The accuracy and completeness of clinical and histopathological data are contingent on the quality of medical record documentation. Variability in record-keeping practices and the potential for errors in data entry may affect the reliability of our findings.
4. **Confounding Factors:** While efforts were made to control for confounding factors, such as comorbidities and medication use, there may still be unmeasured or residual confounders that could influence the observed associations.
5. **Limited Generalizability:** As with many retrospective studies, the findings may not be directly applicable to other healthcare settings or regions, potentially limiting their generalizability.
6. **Sample Size:** While the study included a substantial number of cases, the sample size may still be limited for detecting rare or less common lower gastrointestinal lesions or for conducting more detailed subgroup analyses.
7. **Temporal Factors:** The study's retrospective nature may not capture the dynamic changes in diagnostic and treatment practices over time. This limitation could impact the relevance of the findings in contemporary medical practice.
8. **Ethnic and Racial Diversity:** The study's patient population may lack ethnic and racial diversity, which could limit the applicability of findings to more diverse populations with potentially different risk factors and clinical characteristics.
9. **Publication Bias:** The results presented in this study may not account for unpublished data or studies with negative findings, potentially introducing publication bias.
10. **Causation Inference:** This study primarily establishes associations rather than causation. While it identifies factors associated with lower gastrointestinal lesions, causative relationships require further prospective research.

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