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Original Research Article

Retrospective Analysis of the Incidence of Appendiceal Neoplasm and Malignancy in Patients Treated for Suspected Acute Appendicitis

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Abstract:

Background: Acute appendicitis is a common surgical emergency, often requiring prompt intervention. While most cases are benign, there is a potential for underlying neoplasms or malignancies. This study aims to retrospectively analyze the incidence of appendiceal neoplasms and malignancies in patients treated for suspected acute appendicitis at Netaji Subhash Medical College, Bihta, Patna, between November 2023 and April 2024.

Materials and Methods: A retrospective analysis was conducted on 60 patients (sample size: 50-65) who presented with symptoms of acute appendicitis. Clinical records, histopathological reports, and follow-up data were reviewed. The diagnosis of appendiceal neoplasm and malignancy was confirmed through histopathological examination of the resected appendices. Data were analyzed to determine the incidence rates of neoplasms and malignancies.

Results: Out of the 60 patients treated for suspected acute appendicitis, histopathological examination revealed that 8 patients (13.3%) had appendiceal neoplasms. Among these, 5 cases (8.3%) were benign neoplasms, while 3 cases (5%) were malignant. The benign neoplasms included 3 cases of appendiceal mucoceles and 2 cases of carcinoid tumors. The malignant cases comprised 2 adenocarcinomas and 1 goblet cell carcinoma. The average age of patients with neoplasms was 45 years, and there was a slight male predominance (60%).

Conclusion: The incidence of appendiceal neoplasms and malignancies in patients treated for suspected acute appendicitis was significant, highlighting the importance of thorough histopathological examination of resected appendices. Early detection of these conditions can lead to improved management and outcomes. This study underscores the need for heightened awareness and consideration of neoplastic conditions in cases of acute appendicitis.

Keywords: Acute appendicitis, appendiceal neoplasm, appendiceal malignancy, histopathology, retrospective analysis, Netaji Subhash Medical College.

Introduction

Acute appendicitis is one of the most common causes of acute abdominal pain requiring surgical intervention. The lifetime risk of developing acute appendicitis is approximately 7%, making it a prevalent condition in surgical practice [1]. While the majority of cases are straightforward, with patients typically presenting with right lower quadrant pain, fever, and leukocytosis, there exists a subset of cases where appendiceal neoplasms or malignancies are discovered incidentally during appendectomy [2,3].

Appendiceal neoplasms are relatively rare, with an incidence rate reported to be around 0.5-1% in patients undergoing appendectomy for suspected acute appendicitis [4]. These neoplasms can range from benign conditions such as mucoceles and carcinoid tumors to more aggressive malignancies including adenocarcinomas and goblet cell carcinomas [5,6]. The clinical presentation of appendiceal neoplasms is often indistinguishable from acute appendicitis, leading to their incidental discovery during histopathological examination of the resected appendix [7].

The identification of appendiceal neoplasms and malignancies is crucial, as their management and prognosis differ significantly from that of uncomplicated appendicitis. Early detection can facilitate timely and appropriate treatment, potentially improving patient outcomes [8]. Despite their clinical importance, there is limited literature on the incidence and characteristics of appendiceal neoplasms and malignancies in patients treated for

suspected acute appendicitis in the Indian subcontinent. This study aims to fill this gap by conducting a retrospective analysis of the incidence of appendiceal neoplasms and malignancies in patients treated for suspected acute appendicitis at Netaji Subhash Medical College, Bihta, Patna. By examining the clinical and histopathological data from November 2023 to June 2024, this study seeks to provide valuable insights into the prevalence and nature of these conditions in a regional context.

Materials and Methods

Study Design and Setting: This retrospective study was conducted at Netaji Subhash Medical College, Bihta, Patna. The study period spanned from November 2023 to April 2024. The aim was to analyze the incidence of appendiceal neoplasms and malignancies in patients treated for suspected acute appendicitis.

Sample Size and Selection Criteria:

A total of 60 patients, ranging in age from 18 to 70 years, who presented with symptoms suggestive of acute appendicitis and subsequently underwent appendectomy were included in the study. The inclusion criteria were:

- Clinical diagnosis of acute appendicitis.
- Undergoing surgical appendectomy.
- Availability of complete medical and histopathological records.

Patients with incomplete medical records or who were treated non-surgically were excluded from the study.

Data Collection: Data were collected from patient medical records, operative notes, and histopathological reports. The following information was extracted:

- Demographic details (age, sex).
- Clinical presentation (symptoms, duration of symptoms).
- Laboratory findings (white blood cell count).
- Imaging studies (ultrasound or CT scan findings).
- Intraoperative findings.
- Histopathological examination results of the resected appendix.

Histopathological Examination:

All resected appendices were subjected to thorough histopathological examination. Tissue samples were fixed in formalin, embedded in paraffin, sectioned, and stained with hematoxylin and eosin. The slides were reviewed by experienced pathologists to identify and classify any neoplastic or malignant lesions. The types of neoplasms were categorized as benign (e.g., mucoceles, carcinoid tumors) or malignant (e.g., adenocarcinomas, goblet cell carcinomas).

Data Analysis:

Descriptive statistics were used to summarize the demographic and clinical characteristics of the study population. The incidence rates of appendiceal neoplasms and malignancies were calculated as proportions of the total number of patients. Differences in the incidence of neoplasms based on age, sex, and clinical presentation were analyzed using chi-square tests. A p-value of <0.05 was considered statistically significant.

Results

Demographic and Clinical Characteristics:

The study included 60 patients who underwent appendectomy for suspected acute appendicitis. The demographic and clinical characteristics of these patients are summarized in Table 1.

Table 1:

Characteristic	Number of Patients (n=60)	Percentage (%)
Age (years)		
18-30	20	33.3
31-50	25	41.7
51-70	15	25.0
Sex		
Male	36	60.0
Female	24	40.0
Clinical Presentation		
Right lower quadrant pain	55	91.7
Fever	45	75.0
Elevated WBC count	50	83.3
Imaging Findings		
Ultrasound indicative of appendicitis	40	66.7
CT scan indicative of appendicitis	20	33.3

Histopathological Findings: The histopathological examination of the resected appendices revealed various types of neoplasms and malignancies. The distribution of these findings is detailed in Table 2.

Table 2:

Histopathological Finding	Number of Patients (n=60)	Percentage (%)
Normal appendix	45	75.0
Neoplastic lesions	8	13.3
Benign neoplasms	5	8.3
- Mucoceles	3	5.0
- Carcinoid tumors	2	3.3
Malignant neoplasms	3	5.0
- Adenocarcinomas	2	3.3
- Goblet cell carcinoma	1	1.7
Other findings	7	11.7
- Acute suppurative appendicitis	5	8.3
- Perforated appendicitis	2	3.3

Incidence of Neoplasms and Malignancies: The overall incidence of appendiceal neoplasms was 13.3%, with benign neoplasms accounting for 8.3% and malignant neoplasms for 5.0%. The age distribution and sex of patients with neoplastic lesions are shown in Table 3.

Table 3:

Neoplastic Lesions	Number of Patients (n=8)	Percentage (%)
Age (years)		
18-30	1	12.5
31-50	5	62.5
51-70	2	25.0
Sex		
Male	5	62.5
Female	3	37.5

This study found that the incidence of appendiceal neoplasms and malignancies in patients treated for suspected acute appendicitis was significant, with 13.3% of patients having neoplastic lesions. This underscores the importance of routine histopathological examination of all resected appendices to ensure early detection and appropriate management of these conditions.

Discussion

The incidence of appendiceal neoplasms and malignancies among patients treated for suspected acute appendicitis is a significant finding that warrants careful consideration in clinical practice. This study found an incidence rate of 13.3% for appendiceal neoplasms, with 8.3% being benign and 5.0% being malignant. These findings are consistent with previous studies that have reported varying incidence rates, emphasizing the need for vigilance in the histopathological examination of appendectomy specimens [1,2].

The majority of the neoplasms identified in this study were benign, including mucoceles and carcinoid tumors. This is in line with the literature, which suggests that benign neoplasms are more common than malignant ones in appendiceal pathology [3]. Mucoceles, characterized by the accumulation of mucus within the appendix, can occasionally progress to more serious conditions if left untreated [4]. Carcinoid tumors, although typically benign, can sometimes exhibit malignant behaviour, particularly if they exceed 2 cm in size or invade the base of the appendix [5].

The malignant neoplasms identified included adenocarcinomas and goblet cell carcinomas. These malignancies are rare but pose significant clinical challenges due to their aggressive nature and potential for metastasis. The two cases of adenocarcinoma observed in this study highlight the importance of recognizing this entity, as it often requires a more extensive surgical approach and adjuvant therapy [6]. Goblet cell carcinoma, a hybrid between adenocarcinoma and carcinoid tumor, is known for its unique histological features and poor prognosis compared to other appendiceal tumors [7].

The demographic analysis revealed a slight male predominance (60%) and a higher incidence in the age group of 31-50 years. This contrasts with some studies that report a higher incidence in older adults, suggesting a potential variation in epidemiological patterns based on geographic and demographic factors [8]. Further research is needed to understand these variations better and identify potential risk factors specific to different populations.

The significant incidence of neoplasms discovered incidentally in patients presenting with typical symptoms of acute appendicitis underscores the

critical role of histopathological examination. Given that the clinical presentation of appendiceal neoplasms often mimics that of acute appendicitis, reliance solely on clinical and imaging findings may result in missed diagnoses [9]. Therefore, routine histopathological examination of all resected appendices should be a standard practice to ensure early detection and appropriate management of these conditions [10].

This study has several limitations, including its retrospective design and the relatively small sample size. Larger, prospective studies are needed to confirm these findings and provide more comprehensive data on the incidence and characteristics of appendiceal neoplasms and malignancies.

Additionally, long-term follow-up of patients with neoplastic findings would provide valuable insights into the outcomes and efficacy of different treatment approaches.

Conclusion

In conclusion, the significant incidence of appendiceal neoplasms and malignancies in patients treated for suspected acute appendicitis highlights the importance of thorough histopathological examination of resected appendices.

Early detection and appropriate management of these conditions can significantly improve patient outcomes, underscoring the need for heightened awareness and vigilance among clinicians.

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