Spectrum of Histopathological Lesions in Appendectomy Specimens in a Tertiary Care Hospital, Nepal

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Abstract

Introduction: Appendicitis is one of the most common causes of acute abdominal pain. Perforation is the most concerning complication of acute appendicitis and may lead to abscesses, peritonitis, bowel obstruction, fertility issues, and sepsis. It is important to have timely surgery in order to prevent morbidity and motality. Although there are various recent technologies for the diagnosis of acute appendicitis, histopathological examination of appendectomy specimen remains the gold standard method for the confirmation of the appendicitis. Unusual findings like parasites, carcinoids and other tumors can also be identified with the help of histopathological examination. **Materials and Method:** This was a retrospective study conducted in the department of pathology at Universal College of Medical Sciences and Teaching Hospital for 22 months from 1st January 2017 to 31st October 2018. All the surgically resected appendices submitted to department of pathology were included in this study. Relevant clinical data, gross findings and histopathological diagnosis were retrieved from pathology record book and computer databases. Stastistical analysis was done by SPSS 20. **Results:** Total of 412 specimens of appendix were received in the histopathology department from 1st January 2017 to 31st October 2018. There were 227 (55.1%) males and 185 (44.9%) females, among 412 cases of appendicitis with the male: female ratio of 1.2:1. The peak age incidence of appendicitis was found in the age group of 11 to 20 years. More than 80% cases of appendicitis occurred below the age of 40 years. Most common cause for which appendicectomy done was acute suppurative appendicitis (19.2%), followed by acute appendicitis with periappendicitis (17.5%) and gangrenous appendicitis (16.3%) followed by others. Rare causes include Granulomatous appendicitis (1%), Enterobius infestation (0.7%), mucocele (0.5%), mucinous adenocarcinoma (0.2%). **Conclusion:** Histopathological examination of appendectomy specimens may reveal unusual benign and malignant lesions that have significant impact in further management of the patient. Hence, histopathological examination of excised appendix is mandatory to confirm acute appendicitis and diagnose other incidental pathologies that mimic acute appendicitis.

Key words: Appendicitis, Histopathology, Nepal

INTRODUCTION

Appendicitis is one of the most common causes of acute abdominal pain, with a lifetime risk of 8.6% in males and 6.7% in females. [1] Appendicitis is thought to be caused by luminal obstruction from various etiologies, leading to increased mucus production and bacterial overgrowth, resulting in wall tension and, eventually, necrosis and potential perforation. [2] Perforation is the most concerning complication of acute appendicitis and may lead to abscesses, peritonitis, bowel obstruction, fertility issues, and sepsis. [3] It is important to have timely surgery in order to prevent morbidity and mortality, 2% of which is associated with perforation. [4] Although there are various recent technologies for the diagnosis of acute appendicitis, histopathological examination of appendectomy specimen remains the gold standard method for the confirmation of the appendicitis. [5] Identification of Unusual findings like parasites, carcinoides and other tumors can also be identified with the help of histopathological examination which highlights the importance of tissue microscopy. [6]

This study aimed to determine the various histological diagnoses of all surgically removed appendices and to find out the age and sex related incidence of appendicitis and unusual findings which would have effect on patient management and care.

MATERIALS AND METHOD

This was a retrospective study conducted in the department of pathology at Universal College of Medical Sciences and Teaching Hospital during 22 months period from 1st January 2017 to 31st October 2018. All the surgically resected appendices submitted to department of pathology were included in this study. Relevant clinical data, gross findings and histopathological diagnosis were retrieved from pathology record book and computer databases. Using the microscopic findings of each patient's appendectomy specimen that were recorded in the pathology report, the patients were classified into one of thirteen categories: (1) Acute appendicitis; (2) Acute suppurative appendicitis; (3) Acute gangrenous appendicitis; (4) Perforated appendicitis; (5) Acute appendicitis with periappendicitis; (6) Acute on chronic appendicitis; (7) Chronic appendicitis; (8) Recurrent appendicitis; (9) Acute resolving appendicitis; (10) Non-neoplastic mucocele of appendix; (11) Granulomatous appendicitis; (12) Adenocarcinoma and (13) Enterobius infestation. Stastistical analysis was done by SPSS 20.

RESULTS

Total of 412 specimens of appendix were received in the histopathology department during the period of 22 months from 1st January 2017 to 31st October 2018. There were 227 (55.1%) males and 185 (44.9%) females, among 412 cases of appendicitis with the male: female ratio of 1.2:1. The mean age for female was 28.21 yrs with a range of 4 to 83 yrs and the mean age for male was 26.6 yrs with a range of 5 to 71 yrs. The peak age incidence of appendicitis was found in the age group of 11 to 20 years. However, peak age incidence for males was 11 to 20 and 21 to 30 yrs for females. More than 80% cases of appendicitis occurred below the age of 40 years. [Table 1]

Most common cause for which appendicectomy done was acute suppurative appendicitis (19.2%), followed by acute appendicitis with periappendicitis (17.5%) and gangrenous appendicitis (16.3%) followed by others. Rare causes include Granulomatous appendicitis (1%), Enterobius infestation (0.7%), mucocoele (0.5%) and mucinous adenocarcinoma (0.2%). [Table 2].

Table 1: Age and Sex wise Distribution of Appendectomy cases (N=412)

Age groups	Male	Female	No. of cases	Percentage
0-10	19	13	32	7.8
11-20	84	46	130	31.5
21-30	52	65	117	28.5
31-40	31	29	60	14.6
41-50	14	12	26	6.3
51-60	18	14	32	7.7
>60	9	6	15	3.6
Total	227	185	412	100

Table 2: Spectrum of lesions of appendix on histopathology (N=412)

Histologic Diagnosis	Male (n=227)	Female (n=185)	Total (N=412)
Acute appendicitis	32 (58.2%)	23(41.8%)	55 (13.3%)
Acute suppurative appendicitis	42 (53.2)	37 (46.8)	79 (19.2%)
Acute gangrenous appendicitis	38 (56.7)	29 (43 3)	67(16.3%)
Perforated appendicitis	5 (83.3)	1 (16.7)	6 (1.5%)
Acute appendicitis with periappendicitis	44 (61.1)	28 (38.9)	72 (17.5%)
Acute on chronic appendicitis	22 (56.4)	17 (43.6)	39 (9.5)
Chronic appendicitis	11 (55)	9 (45)	20 (4.8)
Recurrent appendicitis	0 (0)	4 (100)	4 (1)
Acute resolving appendicitis	33 (55)	27(45)	60 (14.5)
Non-neoplastic mucocele of appendix	0 (0)	2 (100)	2(0.5)
Granulomatus appendicitis	1(25)	3 (75)	4 (1)
Adenocarcinoma	1(100)	0	1 (0.2)
Enterobius infestation	0	3(100)	3 (0.7)
Total	**227**	**185**	**412**

Pearson chi square test: 17.562 p= 0.130

DISCUSSION

The current study was a two years retrospective study and presents the data on histopathological analyses of 412 appendectomy specimens received in the Department of Pathology at Universal College of

Medical Sciences (UCMS), Bhairahawa, Nepal. The histopathological examination of the appendix confirms the diagnosis of appendicitis and helps in detection of additional pathological findings if present. [7] In our study, numbers of appendectomies performed were more in males (55.1%) as compared to females (44.9%) which were consistent with findings by Zulfikar et al. and Sujatha R et. al. [8, 9]

Age incidence of appendicitis was higher in the second and third decade, about 80% of appendicitis occurring below 40 years of age which is similar with the studies conducted by Shrestha R et. al., Oguntola As et. al., V Vijayasaree et. al. [6, 10, 11] Most common histopathological diagnosis was acute suppurative appendicitis (19.2%) in our study. This finding did not correlate with the studies done by Shrestha R et. al and Bhatta S et. al in Nepal. [6, 12] The possible cause may be due to delay referral of cases in the hospital with late presentation. Acute appendicitis with periappendicitis constituted the second most common diagnosis (17.5%), similar to the study by Sharma S et. al. and Bhatta S et. al. [7, 12]

Acute appendicitis may be the mode of presentation of appendix neoplasms particularly adenocarcinoma. [13] One case that was suspected to be acute appendicitis was finally revealed to have adenocarcinoma on histopathological examination. Patient with adenocarcinoma should undergo subsequent right hemicolectomy. Study done by Patel M et. al. also revealed one case of adenocarcinoma which is similar to our study. [14] A mucocele of the appendix denotes an obstructive dilatation of the appendiceal lumen due to abnormal accumulation of mucus, which may be caused either by a retention cyst, endometriosis, mucosal hyperplasia, cystadenoma, or a cystadenocarcinoma. The incidence of mucocele has been reported to range from 0.2% to 0.3% of all appendectomy specimens. [15] We have found 2 cases of mucocele which is consistent with the study done by Patel M et. al. [14]

Another important diagnosis in our study was granulomatous appendicitis. Incidence of this rare condition has been reported as 0.14% to 0.3% in Western countries and as 1.3% to 2.3% in underdeveloped countries. [16, 17] It can be caused by various infectious and noninfectious factors. Systemic conditions, such as Crohn's disease and sarcoidosis, may be associated with granulomatous inflammation of the appendix. [16] *Enterobius vermicularis*, commonly known as the pinworm, is a widespread parasitic infection that is estimated to affect up to 200 million people worldwide. The association of pinworm infection and appendicitis was first made in the late 19th century. While the reported incidence of pinworm infections in appendectomy

specimens from patients with presumed appendicitis has ranged from 0.2% to 41.8%, inflammation is often associated with pinworm infection in the appendix. [18, 19, 20, 21] In our study the incidence of pinworms in the appendectomy specimens was 0.7%, which is similar to the overall literature.

CONCLUSION

Incidence of appendicitis is high in the second and third decades of life and slightly higher in males than females. Histopathological examination of appendectomy specimens may reveal unusual benign and malignant lesions that have significant impact in further management of the patient. Hence, histopathological examination of excised appendix is mandatory to confirm acute appendicitis and diagnose other incidental pathologies that mimic acute appendicitis.

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