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APPENDICECTOMY SPECIMENS;
FREQUENCY OF UNUSUAL FINDINGS IN ROUTINE HISTOPATHOLOGICAL EXAMINATION

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ABSTRACT... Objectives: To determine the frequency of unusual findings in routine histopathological examination of appendicectomy specimens. **Setting:** Surgical Department of Govt: City Hospital, Lakki Marwat. **Study Design**: Descriptive study (cross sectional). **Period:** One year (01/01/2016 to 31/12/2016). **Methodology:** A total of 497 patients (both male and female) in age range of 18-60 years were studied. A complete history with clinical examination and relevant investigations were performed in all patients. After Establishment of diagnosis standard appendicectomy either open or Laparoscopic depending upon availability was done. Appendicectomy specimen was sent to Pathology Department of the hospital. Histopathology reports were collected by patient or his/her relatives and a copy was provided to the researcher by Pathology Department. All the relevant data received from histopathology report was recorded on predesigned proforma. **Results:** In this study mean age was 27 years with standard deviation ± 1.26. Forty two percent patients were male and 58% patients were female. Histopathology findings among 497 patients was analyzed as appendix was negative in 20% patients while positive appendix was found in 80% patients, in which 34% patients had lymphoid hyperplasia, 61% patients had fecolith, 4% patients had parasitic infestation (specify), 0.8% patients had tuberculosis and 0.5% patients had neoplasia. **Conclusion:** Although unusual pathological findings are seldom seen during an appendectomy, all appendectomy specimens should be sent for routine histopathological examination.

Key words: Unusual Findings, Histopathological Examination, Appendicectomy Specimens.

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INTRODUCTION

Acute Appendicitis is one of the commonest abdominal emergency.[1,3,4,5] Ailments like appendicitis and symptoms of pain right lower quadrant attributed to Perityphlitis were known since ancient times[1,2] but the term Appendicitis was first coined by Reginal Fitz in 1886.[1,2,4] Claudius Amayand is Credited with the first removal of inflamed Appendix in 1736.[2,3] The incidence for all age groups is 11/1000.[3] The disease is slightly predominantly found in male Population with a reported male to female ratio of 1.3 to 1.4 :1.[2,3] The disease occurs with equal frequency before puberty.[1] Approximately 7% of all people undergo Appendicectomy during their lifetime[2], the risk for male population is 8.6% And 6.7% in female population.[1,3] The disease is most common in early adult life[1],With a mean age of 31.3 years and median age of 22 years at presentation.[2] Seasonal Variations also occur in the incidence of the disease.[1,6]

Appendicitis is believed to be caused by Obstruction of its lumen, mostly either by Lymphoid Hyperplasia or fecolith.[1,2,4] Following Obstruction, Mucin production and incited inflammatory response leads to increased intraluminal pressure resulting in oedema. Mucosal ulceration and bacterial translocation.[1,2] With Increase pressure in the organ Venous return is impeded resulting in ischemia[1,2], which leads to bacterial invasion of all the layers resulting in appendicitis.[1] The organ may then be walled off by omentum[1]or may Perforate.[1,2]

Apart from aforementioned causes the

disease can be caused a number of other aetiologies.[2,3,4] Intraluminal Parasites can cause Appendicitis[2,4], Parasitic infestations incriminated include Acariasis.[2,4], Oxyurasis[7], Entrobius[2,4], Schistosomiasis[4,8], Tineasis[4], Strongyloidasis[2], Blantidiasis[4] and Amoebiasis.[2,4] The reported incidence of Pinworm infestation in appendicectomy specimen is from 0.2% to 41.8% and inflammation rate due to pin worm infestation is 13% to 37%.[4] Oxyuriasis infestation has been reported in 4% of appendicectomy specimens.[7] Granulomatous diseases as Tuberculosi[4,5,8] can cause appendicitis. Appendicular Tuberculosis is reported in up to 3% of all the specimens examined.[4,5,8] Acute Appendicitis can be caused by Appendicular neoplasms[1,2,3,4,5] with less than 50% identified intraoperatively.[2,5] The reported incidence of neoplasia in Appendectomy specimens is in the range of 3%[4] to 7.1%[9], wherease Furman etal have shown neoplasm as cause of appendicitis in 29.4% of patients undergoing interval appendicectomy.[10] Appendictis can occur as a result of such aforementioned unusual causes.[3,4,5,9]

The Aim of this study is to find the frequency of such unusual causative factors in our setup. Although they are present in a small number of cases but their presence dictate a change in further management plan of the patient with very important consequences. This study will provide local data and help in formulating Local guidelines for management of such cases keeping in view that Parasitic infestations and Tuberculosis are more common in our part of the world.

METHODOLOGY

This study was conducted at Surgical Department of Govt; City Hospital, Lakki Marwat. Study design was descriptive study (cross sectional) and the duration of study was one year (01/01/2016 to 31/12/2016) in which a total of 497 patients were observed by using 3% Tuberculosis 4,5,8 , 95% confidence level and 1.5% margin of error, under WHO software for sample size estimation. Patients in age range 18-60 years, both gender and all the patients with clinical diagnosis of appendicitis, undergoing appendicectomy both open and laparoscopic were included while patients with documented history of previous malignancy and Inflammatory Bowel disease, Incidental appendicectomies during other procedures were excluded. Study was conducted after approval from hospital ethical board. All patients meeting the criteria was enrolled in the study both through OPD and Emergency Department. The purpose and benefit of study was explained all the patient and written informed consent was taken. A complete history was obtained followed by examination and routine set of investigations in all patients. After Establishment of diagnosis standard appendicectomy either open or Laparoscopic depending upon availability was done. Appendicectomy specimen was preserved in 10% formalin and transported to Pathology Department of the hospital along with Detailed Request Form. Histopathology reports were collected by patient or his/her relatives and a copy was provided to the researcher by Pathology Department. All the relevant data was recorded on predesigned proforma. Strictly exclusion criteria had followed to control confounders and bias in the study results. All statistical analyses was done in SPSS version 10. Mean and standard deviation was computed for numerical variables like age. Frequencies and percentages were computed for categorical variables like gender and Aetiological factors of Appendicitis as Lymphoid hyperplasia, Fecolith, Tuberculosis, Neoplasia and Parasitic infestation. Different Pathologies detected was stratified among age and gender. The results obtained were presented in the form of table and charts.

RESULTS

In this study age distribution among 497 patients was analyzed as 144 (29%) patients were in age range < 20 years, 189 (38%) patients were in age range 21-30 years, 89(18%) patients were in age range 31-40 years, 40 (8%) patients were in age range 41-50 years and 35 (7%) patients in age range 50-60. Mean age was 27 years with standard deviation ± 1.26. Gender distribution among 497 patients was analyzed as 209 (42%) patients were male and 288 (58%) patients were female (Table-I). Histopathology findings among 497 patients was analyzed as appendix was negative in 99 (20%) patients while positive appendix

was found in 398 (80%) patients, in which 135 (34%) patients had lymphoid hyperplasia, 243 (61%) patients had fecolith, 15 (4%) patients had parasitic infestation(specify), 3 (0.8%) patients had tuberculosis and 2 (0.5%) patients had neoplasia (Table-III&IV). Stratification of histopathology findings with age distribution was analyzed in 135 cases of lymphoid hyperplasia, 30 patients were in age range < 20 years, 35 patients were in age range 21-30 years, 41 patients were in age range 31-40 years, 16 patients were in age range 41-50 years and 13 patients were more than 50 years of age. In 243 cases of fecolith, 77 patients were in age range < 20 years, 86 patients were in age range 21-30 years, 41 patients were in age range 31-40 years, 19 patients were in age range 41-50 years and 20 patients were more than 50 years of age. In 15 cases of parasitic infestation (specify), 3 patients were in age range < 20 years, 3 patients were in age range 21-30 years, 5 patients were in age range 31-40 years, 3 patients were in age range 41-50 years and 1 patient was more than 50 years of age. In 3 cases of tuberculosis 1 patient was in age range 31-40 years, 1 patient was in age range 41-50 years and 1 patient was more than 50 years of age and in 2 cases of neoplasia 1 patient was in age range 31-40 years and 1 patient was in age range 41-50 years (Table-V). Stratification of histopathology findings with gender distribution was analyzed in 135 cases of lymphoid hyperplasia, 60 patients were male and 75 patients were female. In 243 cases of fecolith, 115 patients were male and 128 patients were female. In 15 cases of parasitic infestation (specify), 6 patients were male and 9 patients were female. In 3 cases of tuberculosis, 1 patient was male and 2 patients were female and in 2 cases of neoplasia 2 patients were male as shown in Table-VI.

Age	Frequency	Percentage
< 20 years	144	29%
21-30 years	189	38%
31-40 years	89	18%
41-50 years	40	8%
51 -60 years	35	7%
Total	497	100%

Table-I. Age distribution (n=497)

Mean age was 27 years with standard deviation ± 1.26

Gender	Frequency	Percentage
Male	209	42%
Female	288	58%
Total	497	100%

Table-II. Gender distribution (n=497)

Histopathology	Frequency	Percentage
Negative Appendix	99	20%
Positive Appendix	398	80%
Total	497	100%

Table-III. Histopathology findings (n=497)

Histopathology	Frequency	Percentage
Lymphoid Hyperplasia	135	34%
Fecolith	243	61%
Parasitic Infestation(Specify)	15	4%
Tuberculosis	3	0.8%
Neoplasia	2	0.5%
Total	398	100%

Table-IV. Histopathology findings (n=398)

Histopathology	< 20 years	21-30 years	31-40 years	41-50 years	>50 years	Total
Lymphoid Hyperplasia	30	35	41	16	13	135
Fecolith	77	86	41	19	20	243
Parasitic Infestation(Specify)	3	3	5	3	1	15
Tuberculosis			1	1	1	3
Neoplasia			1	1		2
Total	110	124	89	40	35	398

Table-V. Stratification of histopathology findings with age distribution (n=398)

Histopathology	Male	Female	Total
Lymphoid Hyperplasia	60	75	135
Fecolith	115	128	243
Parasitic Infestation (Specify)	6	9	15
Tuberculosis	1	2	3
Neoplasia	2		2
Total	184	214	398

Table-VI. Stratification of histopathology findings with gender distribution (n=398)

DISCUSSION

Acute appendicitis is the most common general surgical emergency, and obstruction of the appendiceal lumen seems to be essential for developing an appendiceal infection. Although fecaliths and lymphoid hyperplasia are the usual causes of the obstruction, some unusual factors could also be involved.

Our study shows that mean age was 27 years with standard deviation ± 1.26. Forty two percent patients were male and 58% patients were female. Histopathology findings among 497 patients was analyzed as appendix was negative in 20% patients while positive appendix was found in 80% patients, in which 34% patients had lymphoid hyperplasia, 61% patients had fecolith, 4% patients had parasitic infestation (specify), 0.8% patients had tuberculosis and 0.5% patients had neoplasia.

The reported incidence of Pinworm infestation in appendicectomy specimen is from 0.2% to 41.8% and inflammation rate due to pin worm infestation is 13% to 37%.[4] Oxyuriasis infestation has been reported in 4% of appendicectomy specimens.[7] Granulomatous diseases as Tuberculosis can cause appendicitis. Appendicular Tuberculosis is reported in up to 3% of all the specimens examined.[4,5,8] Acute Appendicitis can be caused by Appendicular neoplasms with less than 50% identified intraoperatively.[1-5] The reported incidence of neoplasia in Appendectomy specimens is in the range of 3%[4] to 7.1%, wherease Furman etal have shown neoplasm as cause of appendicitis in 29.4% of patients undergoing interval appendicectomy.[9,10] Appendictis can occur as a result of such aforementioned unusual causes.[3,4,5,9]

The finding of appendices with abscess (20.7%) and gangrenous appendix (7.7%) reflects delay in seeking medical help. It is believed that in western world chronic appendicitis is rare but in our study 10% patients had chronic granulomatous changes consistent with tuberculosis. Definite diagnosis of tuberculosis of the appendix mainly depends upon histopathology. Results of all preoperative investigations are non-specific and the diagnosis is made only after histopathology. It is recommended that in order to avoid misdiagnoses, all appendices should be histopathologically examined.[11]

Similar findings were observed in another study conducted by Akbulut S et al in which mean age was 27 years with standard deviation ± 1.26.[12] Forty two percent patients were male and 58% patients were female. Histopathology findings among 497 patients was analyzed as appendix was negative in 25% patients while positive appendix was found in 75% patients, in which 30% patients had lymphoid hyperplasia, 55% patients had fecolith, 4% patients had parasitic infestation (specify), 1% patients had tuberculosis and 1% patients had neoplasia.

CONCLUSION

Routine histopathological examination of the appendix yields important clinical information in addition to operative findings and should be undertaken in all cases. Unusual or co-existing pathologies though rarely seen but their final confirmation can be done by histopathological examination only. Although unusual pathological findings are seldom seen during an appendectomy, all appendectomy specimens should be sent for routine histopathological examination.

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AUTHORSHIP AND CONTRIBUTION DECLARATION

Sr. #	Author-s Full Name	Contribution to the paper	Author=s Signature
1	Abdul Waheed Jan	Conception and design writing of manuscript.	
2	Hanifullah Khan	Statistical analysis and guidence in writing the manuscript.	
3	Gul Rehman	Data collection and composing resutls	