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Original Research Article

Histopathological Analysis of Appendicectomy Specimens

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Abstract

Acute appendicitis is one of the most common surgical cause of acute abdomen with life time risk of 7%. A 5-year study was conducted and it comprised of all the surgically resected appendices submitted to department of pathology, Al-Ameen medical college, Bijapur. The study analysed various histopathological diagnoses, demographic profile and the rates of negative appendectomy. Total 777 cases were analysed, among them 392 were females and 385 were male, highest number of cases were seen in first and second decades of the life. It was found that acute appendicitis was more common in females and incidence of recurrent appendicitis is slightly higher in males. 18% of acute suppurative appendicitis was seen and 23 cases of acute eosinophilic appendicitis was noted. In present study, 25.7% of cases with faecolith in the lumen of appendix was noted. Parasitic infestation can cause blockade of the lumen leading to appendicitis. In our study only 2 (0.26%) cases had a parasitic infestation and enterobius vermicularis was the parasite identified in both the cases. The percentage of negative appendicectomy in our study was 5.15%. Negative appendicectomy was higher in females (62.5%) compared to males. Thus, in present study recurrent appendicitis was more common than the acute appendicitis, maximum number of cases were in the age group of first and second decades of the life, faecoliths considered very common cause of appendicitis was noted only in 25.7% and negative appendicectomy was more common among the females.

Keywords: Appendicitis, Appendicectomy, Faecolith, Negative appendicectomy.

INTRODUCTION

Acute appendicitis is one of the most common surgical cause of acute abdomen with life time risk of 7% [1]. Acute appendicitis is more common among older children and young adults [2]. Incidences of appendicitis raises gradually from birth with a maximum in the late 10 years and then gradually declines [3]. Appendicitis is most prevalent in the age group of 10–19 years. Incidences of appendicitis is less in Asian and African countries may be because of their dietary habits [4]. Recently it has been witnessed that the incidences of appendicitis in the developing country is on rise may be due to adaptation of western diet [5]. In Appendicitis, the symptoms appear suddenly and often patients seek for immediate health care [6]. Typical clinical symptoms presented by majority of patients include abdominal pain, fever and vomiting. Treatment of choice for appendicitis is Appendicectomy and this surgical procedure has a very low mortality rate which may range from 0.07 to 0.7% [7]. Accurate diagnosis of appendicitis even today still remains a great clinical challenge despite with the present-day advances in diagnostic medicine [8]. Alvarado score and AIR—Appendicitis Inflammatory Response (Andersson) score are most commonly used diagnostic scoring systems for acute appendicitis, these help in increasing the diagnostic accuracy. A CT scan has high sensitivity and specificity to diagnose cases of suspected appendicitis [9]. Even with advances in medical and diagnostic technologies including various imaging modalities, Histopathology still remains the gold standard for confirmation of the diagnosis of appendicitis. Histopathology not only helps in confirmation of diagnosis of appendicitis but at times has been helpful in detection of incidental tumours in appendix. It emphasizes the importance of performing histopathological examination of each and every resected appendix.

Thus, the present study was proposed to know the different histopathological diagnosis of all surgically resected appendix in our hospital. Along with this the study was also devised to find out the age, sex related incidences of appendicitis and rate of negative appendicectomies.

MATERIALS AND METHODS

A 5-year study was conducted, 3years retrospective from May 2007 to May 2010 and 2 years prospective from June 2010 to June 2012 and it comprised of all the surgically resected appendices submitted to department of pathology, Al-Ameen medical college, Bijapur. Appendix were removed as a therapeutic measure for the clinically suspected cases of appendicitis or during the course of laparotomy for other diseases. After formalin fixation one section was taken from tip, base and intermediate length and sent for routine paraffin processing. Haematoxylin & Eosin stained sections were studied for various histopathological findings of appendicitis. Van Gieson stain was done to confirm the presence of fibro-collagenous tissue.

RESULTS

Total 777 cases were analysed during the study period. Among them 392 were females and 385 were male. In our study the age group of the patients ranged from 6 to 75 years and highest number of cases were noted in the first and second decades of the life.

Table-1: Age and Sex Distribution of the Patients Studied

Age range	Male		Female	
	No of cases	Percentage (%)	No of cases	Percentage (%)
0-10	34	8.83	30	7.65
11-20	167	43.38	171	43.62
21-30	133	34.55	121	30.87
31-40	36	9.35	48	12.24
41-50	9	2.34	14	3.57
51-60	4	1.04	6	1.53
61-70	1	0.26	2	0.51
71-80	1	0.26	0	0.00
81-90	0	0.00	0	0.00
Total	385	100.00	392	100.00

Increased incidence of acute appendicitis was seen in younger age group and recurrent appendicitis in the age group>20 years. It was found that acute appendicitis was more common in females and incidence of recurrent appendicitis is slightly higher in males, compared to females.

Table-2: Age and Sex Distribution of Various Histopathological Groups of Appendices Studied

Histopathological groups	Age in years		Sex of the patient	
	Age group (0-20 years)	Age group >20 years	Male	Female
Normal	20	20	15	25
Acute appendicitis	201	139	168	172
Acute suppurative appendicitis	10	8	8	10
Acute eosinophilic appendicitis	13	10	14	9
Recurrent appendicitis	158	198	180	176
Total	402	375	385	392

Out of 777 Appendices hyperaemia was seen in 83.66%, 13.64% of the appendices were swollen and 1.29% showed pus on the surface. Mucosal ulceration was seen in 39.9% of cases and faecolith in only 25.7% of cases.

Table-3: Gross Finding

GROSS FINDING			
External surface	**Wall**	**Mucosa**	**Lumen**
Normal - 11(1.4%)	Normal - 151(19.4%)	Ulceration - 454(58.4%)	Narrowing – 310(39.9%)
Hyperaemia - 650(83.7%)	Thickening - 266(34.2%)	Hyperaemia - 323(41.6%)	Dilatation – 247(31.8%)
Swollen - 106(13.6%)	Thinning - 360(46.3%)		Faecolith – 200(25.7%)
Exudate/ Pus - 10(1.3%)			Exudate – 20(2.57%)
Perforation - 0(0%)			

Out of 777 cases luminal exudates with neutrophil predominance was seen in 38.61% and eosinophil predominant exudate in 9.6% of cases. Two cases of parasitic infestation were seen.57.9% of appendiceal mucosa showed ulceration, with maximum number of cases shows lymphocytic predominance

(58%). Submucosa shows oedema in 30.2% of cases and inflammation in 55% of cases. Lymphocytic predominant infiltrate of submucosa was seen in 55% and Neutrophilic in 38.6% of the cases. In muscularis propria, oedema is seen in 31% cases, inflammation in 42% and fibrosis in 56.6% of cases. In serosa of the appendix studied, shows oedema in 20%, inflammation in 25%, fibrosis in 8.6% and congestion in 45.3% of cases.

Table-4: Histological Findings in Various Layers of the Appendices Studied

Histopathological findings		No. of cases	Percentage (%)
LUMINAL EXUDATE			
Absent		400	51.48
Neutrophilic predominance		300	38.61
Eosinophilic predominance		75	9.65
Parasite		2	0.26
MUCOSA			
Normal		110	14.16
Ulceration		450	57.92
Hyperaemia		217	27.93
Neutrophilic predominance		302	38.87
Eosinophilic predominance		23	2.96
Lymphocyte predominance		452	58.17
SUBMUCOSA			
Submucosal edema		235	30.24%
Inflammation		429	55.21%
Predominantly inflammatory cells			
Neutrophilic predominance		300	38.61
Eosinophilic predominance		47	6.05
Lymphocyte predominance		430	55.34
Fibrosis		287	36.94%
Submucosal lymphoid tissue			
Present		436	56.11
Hyperplastic		75	9.65
Absent		266	34.23
MUSCULARIS PROPRIA			
Edema	Present	242	31.15
	Absent	535	68.85
Inflammation	Present	331	42.60
	Absent	446	57.40
Fibrosis	Present	337	43.37
	Absent	440	56.63
SEROSA			
Edema		156	20.07
Inflammation		201	25.8
Fibrosis		67	8.6
Congestion		353	45.3

Out of 777 cases maximum number of cases or recurrent appendicitis showed fibrosis (special stain Van Gieson)

Table-5: Fibrosis in the Layers of the Appendices in Various Histopathological Groups

HISTOPATHOLOGICAL GROUPS	PRESENCE OF FIBROSIS
NORMAL	0
ACUTE APPENDICITIS	55
ACUTE SUPPURATIVE APPENDICITIS	48
ACUTE EOSINOPHILIC APPENDICITIS	30
RECURRENT APPENDICITIS	285

DISCUSION

Appendicitis is one of the common causes of acute abdomen and appendicectomy being one of the common and frequently performed surgical operation. Of all surgical emergencies, in the western world acute appendicitis accounts for about 40% of cases but is comparatively less in Asia and Africa because of the life style and diet of the people in this region [5]. Peak incidence of appendectomies was observed in teens and early 20's. 76.19% of patients were in the age group of 11 to 30 years. Even though not statistically significant higher incidences of appendicitis were noted in female when compared to males in our study [10, 11]. In contrast to other studies female predominance was seen in this study [5, 12]. Recurrent appendicitis was the most common histopathological diagnosis followed by acute appendicitis. In the present study, the term chronic appendicitis was avoided since its existence has been disputed. Instead, the current term recurrent appendicitis was used for the cases showing similar histological features along with clinical history of repeated bouts of abdominal pain in the past. In the present study, the incidence of acute appendicitis was found to be 43.5%. A higher incidence of acute appendicitis was seen in the age group below 20 years and in females. In the current study, recurrent appendicitis was seen more frequently than acute appendicitis. The incidence of recurrent appendicitis was higher in the age group above 20 years. 18% of acute suppurative appendicitis was seen, comparable to the study done by Shrestha R et al which showed (20.8%) of acute suppurative appendicitis similar to our study [2]. In the present study 23 out of 777 appendices showed the histological features fitting into category of acute eosinophilic appendicitis as described by Aravindan K *et al*., [13]. In the present study 36% showed fibrosis in submucosa and 56% in muscularis propria and highest number of cases of fibrosis was seen in recurrent appendicitis compared to other histopathological groups. Chronically inflamed appendix may cause recurrent pelvic pain. Hence high degree of suspicion of appendicitis is essential in chronic pelvic pain to reduce or to avoid repeated unnecessary admission to hospitals. The main Etiology of appendicitis is blockade of the lumen by faecoliths [14]. In present study, 25.7% of cases with faecolith in the lumen of appendix was noted. Parasitic infestation can cause blockade of the lumen leading to appendicitis. In our study only 2 (0.26%) cases had a parasitic infestation which can be comparable to a study done by Shrestha R [2]. Enterobius vermicularis was the parasite identified in both the cases. The percentage of negative appendicectomy in our study was 5.15%. This is lower than the other studies which have shown wide variation ranging from 6.1% to 34.2% [2, 15, 16]. Negative appendicectomy was higher in females (62.5%) compared to males. Thus, in present study recurrent appendicitis was more common than the acute appendicitis, maximum number of cases were in the age group of first and second decades of the life, faecoliths considered very common cause of appendicitis was noted only in 25.7% and negative appendicectomy was more common among the females.

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