

A Histomorphological Study of Various Appendicectomy Specimens, in Correlation to Age, Sex and Clinical Diagnosis of the Patient

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Abstract: Introduction: Acute appendicitis accounts for one of the most common conditions that demand emergency operation. Clinically it is a diagnostic challenge. Grossly a normal appearing appendix operated is suspected of acute appendicitis on histopathological diagnosis. Hence histopathological study is the gold standard for diagnosis of acute appendicitis. Most common cause of obstruction in appendix is faecoliths followed by inflammatory conditions and malignancies. Aim: To study histopathological patterns in all appendicectomy specimens in a duration of three years in correlation to age, sex and clinical diagnosis of the patient. Materials and Method: This is a retrospective study of 200 appendicectomies done in Yenepoya Medical College and Hospital, Deralakatte, Mangalore during a period of three years from January 2013 to January 2016. Sections were studied and analysed for various histopathological patterns in Department of Pathology, Yenepoya Medical College, Mangalore. Results: A total of 200 specimens were analyzed. 147 (73.5%) were males and 53 (26.5%) were females. The histopathological examination showed acute appendicitis (47%), chronic appendicitis (29.5%), acute suppurative appendicitis (8.5%), eosinophilic appendicitis (4.5%), gangrenous appendicitis (3.5%), perforated appendix (1%), enterobius vermicularis (0.5%), carcinoid (0.5%), negative appendicectomy (5%). Conclusion: Incidence of appendicitis is high in adolescents and young adults and slightly higher in females. Majority of the cases were diagnosed with the usual features of appendicitis, though a few of them were essential incidental diagnoses which were missed preoperatively or intraoperatively.

Keywords: Appendicectomy, faecoliths, patterns

1. Introduction

Appendicitis accounts for most common abdominal emergency and appendicectomy is routinely performed surgeries all over the world. (1) Incidence of appendicitis is increasing in India and other developing countries, mainly in urban cities due to increased acceptance towards western diet. (2) Appendicitis occurs commonly in children and young adults with a lifetime risk of 7%. (3) In spite of all the recent advancements, clinical diagnosis of acute appendicitis is accurate in only 60 - 80% of cases. (4) Therefore, histopathological examination is always the gold standard method of choice for confirmation of appendicitis.

Appendicitis can be obstructive / non - obstructive type. Luminal obstruction is the most common cause in acute appendicitis, example faecolith, lymphoid hyperplasia and foreign bodies. Various parasitic infestations are involved which includes Enterobiasis, Ascariasis, bacterial infections like tuberculosis or carcinoids and other conditions such as primary / secondary adenocarcinoma, lymphoma, gastrointestinal stromal tumor. (5)

Therefore the present aim is to evaluate the various histopathological diagnosis of appendicectomy specimens to find out unusual factors for appendicitis and compare them according to age, sex, and clinical diagnosis.

2. Materials and Method

This is a retrospective study which was done in the Department of Pathology, Yenepoya Medical college, Deralakatte, Mangalore. A total of 200 cases of appendicectomy specimen was received in the histopathology section during a period a three years from January 2013 to January 2016. All emergency appendicectomies and interval appendicectomies done for cases of clinically suspected appendicitis and incidental appendicectomies done for other surgeries were included.

Relevant clinical data was retrieved. Gross findings of all specimens were noted. Specimens were fixed in 10% formalin, routine tissue processing and paraffin embedding done. This was followed by tissue sectioning at 5 micrometre thickness sections and were analyzed. Haematoxylin and Eosin staining was used to study the sections and finally histopathological diagnosis was done accordingly.

3. Results

A total of 200 specimens were analyzed. 147 (73.5%) were males and 53 (26.5%) were females. The histopathological examination showed acute appendicitis (47%), chronic appendicitis (29.5%), acute suppurative appendicitis (8.5%), eosinophilic appendicitis (4.5%), gangrenous appendicitis

(3.5%), perforated appendix (1%), enterobius vermicularis (0.5%), carcinoid (0.5%), negative appendectomy (5%).

Total of 200 cases were received during the period of January 2013 to January 2016.

Table 1: Age and Sex Distribution in Acute Appendicitis Cases

Age (Years)	Males	Females	Total
0 - 9	1	1	2
10 - 19	20	15	35
20 - 29	70	25	95
30 - 39	33	5	38
40 - 49	15	3	18
50 - 59	5	2	7
60 - 69	3	2	5
Total	147 (73.5%)	53 (26.5%)	200

Table 2: Histomorphological Analysis of Various Appendicectomy Specimens

Clinical Diagnosis	Histopathological Diagnosis	No. of Cases	Percentage (%)
Acute Appendicitis	Acute Appendicitis	94	47%
	Chronic appendicitis	59	29.5%
	Acute Suppurative Appendicitis	17	8.5%
	Eosinophilic Appendicitis	9	4.5%
	Gangrenous Appendicitis	7	3.5%
	Perforated	2	1%
	Enterobius Vermicularis	1	0.5%
	Carcinoid	1	0.5%
	Negative Appendicectomy	10	5%
Total		200	

4. Discussion

Acute appendicitis is the most frequently encountered surgical emergency. It accounts for about 40% of all surgical emergencies in the Western world. It is rare in Asian and African countries. Due to adoption of Western diet and lifestyle, recent studies show that there is an increase in incidence of appendicitis in African countries. Incidence of appendicitis varies considerably by country, race, age, sex, geographic region, socio - economic status, dietary habits and hygiene. (2)

The vermiform appendix is considered by most to be a vestigial organ. Its clinical importance lies in its predilection for inflammation which results in clinical syndrome known as acute appendicitis. Acute appendicitis was recognised as a clinical entity first by Reginald Fitz. Soon afterwards, Charles Mc Burney described the clinical manifestation of acute appendicitis including the point of maximum tenderness in right iliac fossa, that's how it bears his name. (5)

Our observation also showed the higher incidence of acute appendicitis accounting to 47%. The other studies showed a variable incidence rate of appendicitis. Khan et al, reported acute appendicitis to be the most common cause of emergency laparotomy showing incidence of 25%. (17) Majority of the cases of appendicitis in our were males 147 (73.5%), and 53 (26.5%) were females.

Obstruction is usually in the form of luminal obstruction such as faecolith, fibrosis or stricture which can lead to proliferation of aerobic and anaerobic bacteria. Lymphoid hyperplasia can also narrow the lumen leading obstruction. Once obstruction occurs, there is continued mucus secretion and inflammatory exudation which leads to increased intraluminal pressure resulting in obstruction of lymphatic drainage. (5)

It has been observed that in around 15 - 30% of cases diagnosed as acute appendicitis, there is discrepancy between the histopathological and clinical diagnosis. The histopathological study of appendix has the advantage that it confirms the diagnosis of acute appendicitis. Also, it reveals other important pathological findings that may not be obvious on gross examination intraoperatively but may affect further clinical management of patient. (6)

Regardless of advances in technology, there is no laboratory test or examination with adequate specificity and sensitivity to diagnose appendicitis consistently. Around 7% of the total population will be diagnosed with appendicitis in their lifetime with peak age incidence between 10 and 30 years. (5)

In our study of 200 cases appendicectomy specimens, 161 were found to be non - neoplastic, 1 cases showed malignancy and remaining 38 showed normal histology of appendix. In a retrospective study by Blair et al. it was reported that 80% of appendicectomy cases were non - neoplastic lesions and 4% were neoplastic. (7) The rest of the cases showed normal histology of appendix which correlated with our study.

The incidence of age in acute appendicitis were higher in the second and third decade, about 80% of appendicitis occurring below 40 years of age in concordance with various studies. (14) (15)

Majority of our patients presented with right iliac fossa pain followed by generalised weakness and generalised pain. Edino et al in their study also reported that abdominal pain was the most common presenting symptom in such patients. (8)

Parasitic infestation are one of the main causes of luminal obstruction in acute appendicitis. Several studies showed that luminal obstruction of appendix with or without appendicitis. (9) The commonly found parasites in the lumen are Enterobius vermicularis and Schistosoma species. In our study, two cases showed parasitic infestation. Worldwide the reported incidence of Enterobius infestation with symptoms of appendicitis ranged from 0.2% to 41.8% (13)

There was only one case of carcinoid tumour of appendix in our study. The literature review showed that incidence of carcinoid tumour ranging from 0.1% to 1.05% mostly found incidentally during microscopic examination. (10) In the present study, the tumour was not associated with acute inflammation of the appendix and the abdominal pain could be explained due to the elaboration of inflammatory mediators. (11)

Majority of the histologic diagnoses was acute appendicitis followed by acute suppurative and gangrenous appendicitis, which was similar to another study done by Zulfikar et al (12).

The number of appendicetomies performed were more in males compared to females which was consistent with findings by Zulfikar et al. who studied 323 cases retrospectively in which majority were males. (16)

Eosinophilic appendicitis and chronic / recurrent / resolving appendicitis were more common in females of older age group, which correlated to the study done by Park et al. (18) The diagnosis of chronic / recurrent / resolving appendicitis is still controversial; and its existence has been debated. Some authors postulated that chronic or recurrent pelvic pain may be, to some extent, attributed to a chronically inflamed appendix; and when removed in an otherwise anatomically normal pelvis, can reduce pain in one half of the patients. (19)

The use of diagnostic laparoscopy followed by appendectomy if necessary in females were found to reduce the rate of negative appendicetomy by several fold. (20) In our study negative appendicetomy accounted to 5%.

5. Conclusion

Appendicitis has peak incidence in second and third decades of life. An accurate macroscopic assessment is difficult intraoperatively therefore all appendicetomy specimens needs to be sent for histopathological examination. Histopathological study is the gold standard of analyzing specimens.

In the present study, the histopathological examination provided a confirmation for many incidental lesions. These diagnosis is essential in the treatment of the patient. Therefore it can be concluded that the advantage of routine histopathological examination definitely is essential in management of the patient.

Diagnosing acute appendicitis accurately and efficiently can reduce morbidity from perforation and other complications. Individual signs and symptoms are more helpful at ruling in the diagnosis than they are at ruling it out when absent. The variable location of the appendix causes variations in the clinical presentation, thus making the diagnosis more challenging.

To conclude it is highly recommended that all appendicetomy specimens should be sent for histopathological examination without fail so that any existing pathology is never undiagnosed.

Source: Equipments from Department of Pathology, Yenepoya Medical College, Mangalore, Karnataka, India.

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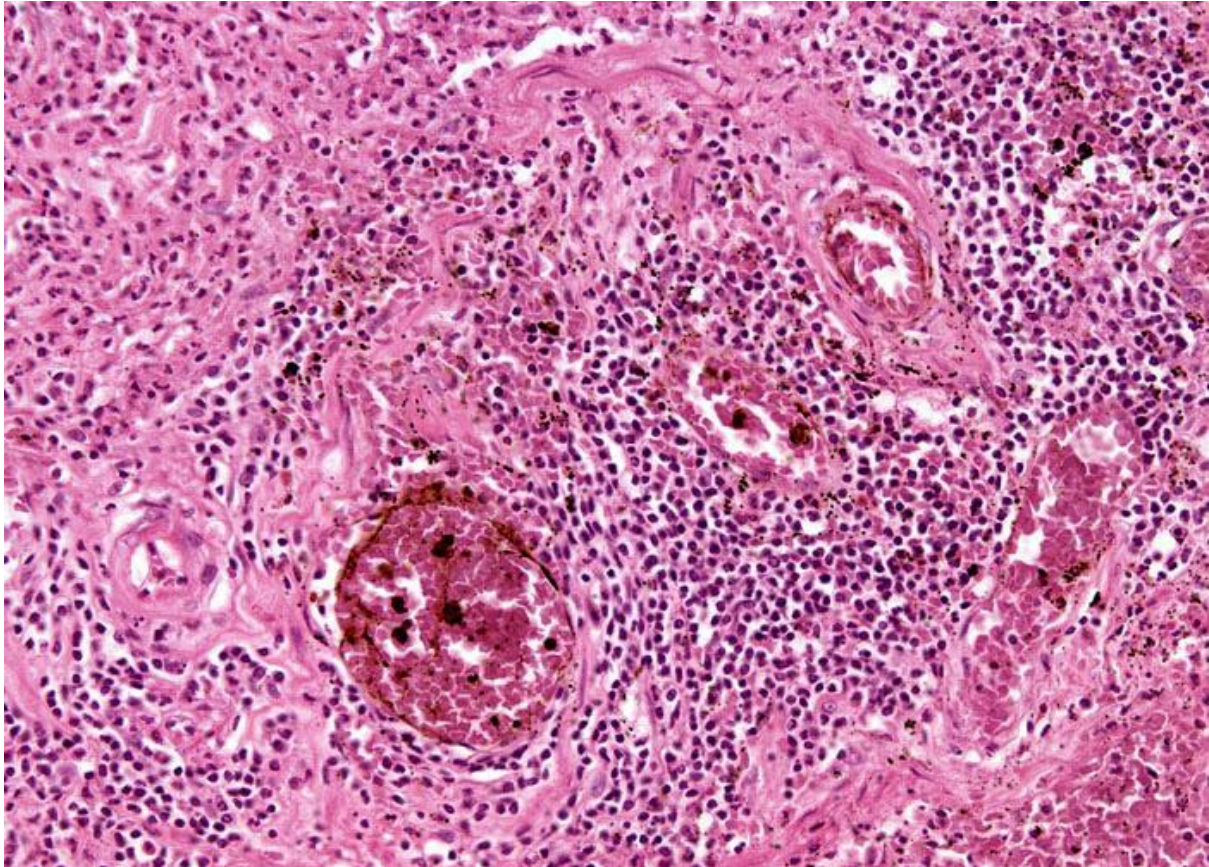


Figure 1: Microphotograph of acute suppurative appendix showing mixed inflammatory cell infiltrate along with exudates accumulated in the lumen of appendix. (H & E, 40X)

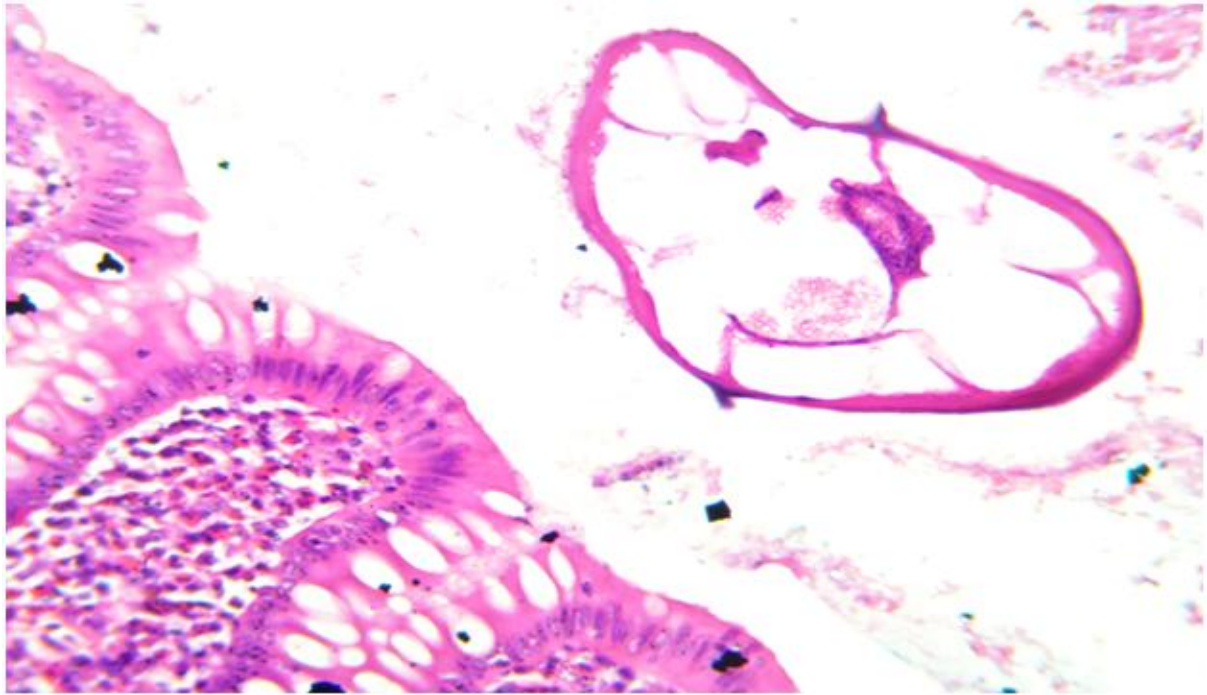


Figure 2: Microphotograph showing *Enterobius vermicularis* in lumen of appendix (H & E, 40X)

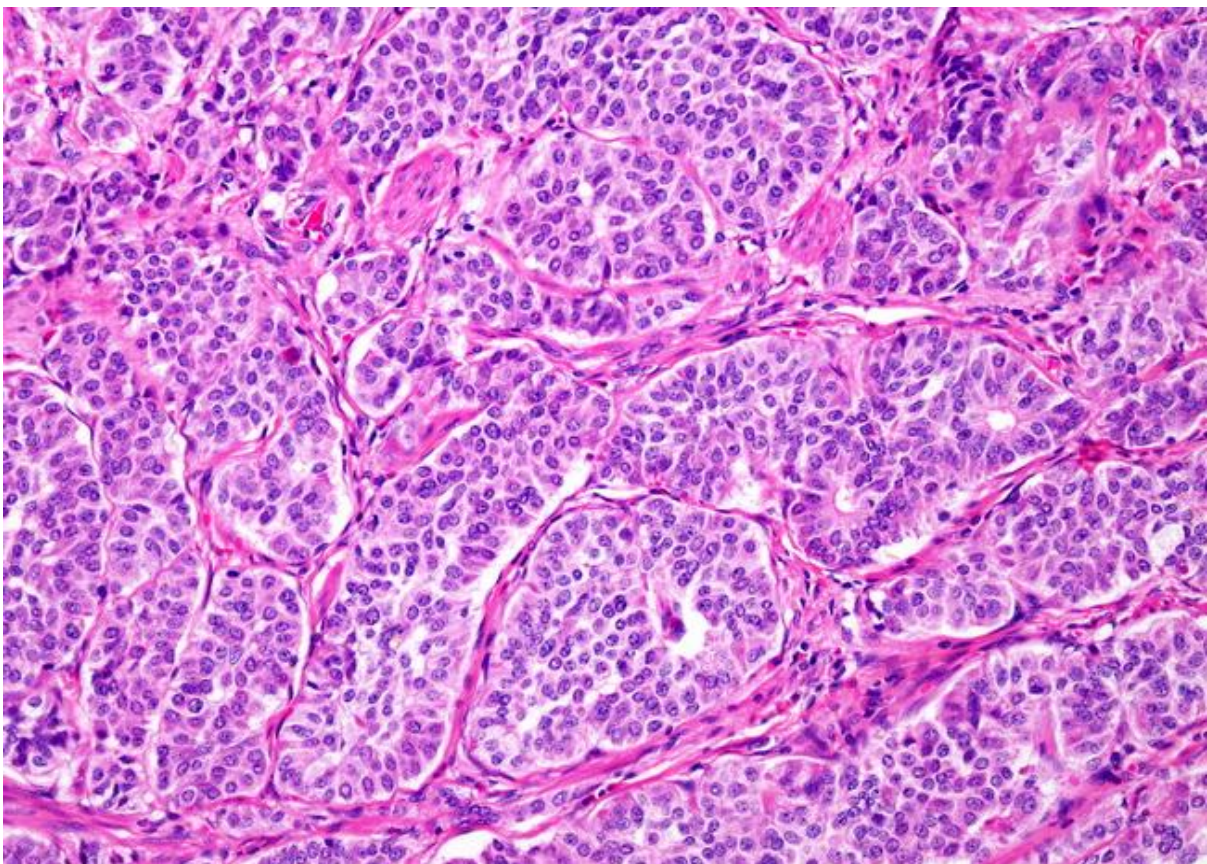


Figure 3: Microphotograph of Carcinoid tumour of appendix, tumour cells arranged in organoid pattern with individual cells showing salt and pepper type of chromatin (H & E, 40X)