"Review of the Pathologic Diagnoses of Appendectomy Specimens"

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Objective: The purpose of this study is to see the pattern of various histopathological diagnoses in appendectomy specimens.

Setting: This retrospective study carried out at Isra University Hospital, Hyderabad and three main hospitals of Hyderabad over a period of two years starting from March 2006 to February 2008.

Methods: Hospital records of all patients who were diagnosed as acute appendicitis and underwent appendectomy (either open or laparoscopic) were reviewed retrospectively. Patients' age, sex operative findings and histopathology reports were noted. Histopathology reports were analyzed according to the diagnosis.

Results: Hospital records of 323 patients who were diagnosed as acute appendicitis and underwent appendectomy (either open or laparoscopic) were reviewed. 86.3% specimens revealed findings of acute appendicitis, 10.8% were normal, while 3% has tuberculosis, 1.5% had Meckle diverticulitis and 0.6% each of adenocarcinoma and Carcinoid tumour. Among acute appendicitis, lymphoid hyperplasia was the predominant finding seen in 57.8% of cases.

Conclusion: Other than acute inflammation, routine histopathological examination of the appendix yields important clinical information like benign and malignant tumours. All appendectomy specimen should be sent for routine histopathological examination so as not to other unusual or co-existing pathologies.

Key words: Appendectomy, histopathology, acute appendicitis.

Introduction

Acute appendicitis is the most common general surgical emergency.[1] It has incidence of 1.5 and 1.9/1000 in male and female population respectively[2] and mean age group 28 year.[3] The diagnosis of acute appendicitis in many patients especially in young females is difficult to establish. Although it is one of the most common surgical emergencies; the preoperative clinical diagnosis of appendicitis is reported to be correct in only 60-80% of the cases.[4] So, even in this era of technological advancements, the appendicitis continues to be a clinical diagnosis. Approximately 20% of patients, those undergoing appendectomy are found not to have acute appendicitis at surgery[5] but even these patients have their symptoms relieved.

The practice of sending appendectomy specimens for histopathological analysis varies. It is recognized that many resected specimens in general surgery need not to be sent, yet there are no definite guidelines as to whether all appendices should be sent for histopathology as matter of routine. However many of appendiceal tumor are diagnosed on appendectomy specimens.[6] There is also evidence of an inflammatory pathological condition, which is only obvious at microcellular level.[7] Keeping this in mind a retrospective study was performed to see the pattern of various histopathological diagnoses in appendectomy specimens.

Patients and Methods

This is a retrospective study carried out at Isra University Hospital, Hyderabad and three main hospitals of Hyderabad over a period of two years starting from March 2006 to February 2008. The study design was approved by Local hospital ethical committee. Hospital records of all patients who were diagnosed as acute appendicitis and underwent appendectomy (either open or laparoscopic) were reviewed retrospectively. Patients' age, sex operative findings and histopathology reports were noted. Operative notes were analyzed to determine the primary or other co-existing or unusual findings were noted. Histopathology reports were also analyzed according to the diagnosis. Appendectomies done as incidental procedure during some other operation were excluded from this study.

Results

In all, hospital records of 323 patients who were diagnosed as acute appendicitis and underwent appendectomy (either open or laparoscopic) were reviewed during the 2 years period starting from March 2006 to February 2008. All patients were clinically diagnosed as having acute appendicitis based on the physical and laboratory examination. Among these patients, 196 were males and 127 were females. The mean age was 26 years with range from 6 years to 70 years. Age and sex distribution of patients with appendectomy is shown in table 1. Out of 323 cases, in 35 cases (10.8%) report came out to be normal. In 279 cases (86.3%) report was consistent with acute inflammation showing changes of acute appendicitis in 57.8%, abscess in 20.7% and perforated or gangrenous in 7.7% of cases.

Ten cases (3%) showed tuberculosis, 5 cases (1.5%) had Meckel's diverticulitis, 2 cases each (0.6%) were diag-

nosed as adenocarcinoma and carcinoid tumour (0.6%) on histopathology reports.

Detail analysis of histopathological findings of appendectomy specimens is shown in table 2.

Table 1: *Age and Sex Distribution of Patients with Appendectomy Specimens.*

Age (Years)	Male	Female	Total
0 – 10	5	3	8
11 – 20	54	28	82
21 – 30	90	68	158
31 – 40	40	23	63
41 – 50	2	2	4
51 – 60	2	1	3
61 – 70	3	1	4

Table 2: *Analysis of histopathological findings of appendectomy specimens.*

Normal	**35**	**10.8%**
Acute inflammation	279	86.3%
Lymphoid hyperplasia	187	57.8%
Abscess	67	20.7%
Perforated/gangrenous	25	7.7%
Carcinoids	2	0.6%
Meckel's diverticulitis	5	1.5%
Adenocarcinoma	2	0.6%
Tuberculosis	10	3%

Discussion

Despite advantages in technology, there is no laboratory test or examination with sufficient specificity and sensitivity to diagnose appendicitis consistently. Many surgeons are turning from a philosophy of "*when in doubt, take it out"* to "*when in doubt, check it out"*. Approximately 7% of the population will have appendicitis in their life time with peak incidence occurring between the ages of 10 and 30 years. So, the appendectomy is the most frequently performed abdominal operation.[8]

The histopathological examination of the appendix serves two purposes, first it allows the diagnosis of acute appendicitis to be confirmed. Second histopathological examination may disclose additional pathologies that may not be evident intraoperatively which may impact patient management.[9] Patient's symptoms frequently disappear post operatively even with negative histopathologies. It has been suggested that in these cases there may be an early sub clinical appendicitis at micro cellular level. This indicates that it is not possible to make an accurate macroscopic assessment of appendiceal inflammation emphasing more on importance of histopathology.[10]

Our study shows the highest occurrence of appendicitis in 2nd and 3rd decade. This is the same finding as observed by Ojo et al in his study from Nigeria.[11] A false positive diagnosis of acute appendicitis was observed in 10.8% in our study, which is the same as of other recommended values of 10% and 30%.[12] The ratio of negative appendcectomies in females is more. It is suggested that all histopathological specimens should be audited to improve clinical evaluation particularly in females.[13]

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[14] 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.[9,15]

Less than 50% of the appendeceal tumours are identified intraoperativley. Acute appendicitis may be the mode of presentation of appendix neoplasms particularly adenocarcinoma.[16] 0.6% cases accounted as adenocarcinoma in our study which were kept on follow up because 20% may develop secondary malignancy.[17] Carcinoids are the most common tumor of appendix and are typically small, firm, circumscribed yellow-brown lesions.[18] It is plausible that carcinoid tumors may present by appendicitis because of luminal obstruction or elevated levels of 5 hydroxytryptamine, histamine and kinin. As these are all potent mediators of inflammation.[19] Our study showed 0.6% specimens with carcinoids. All patients in our study had signs and symptoms of acute appendicitis. Flushing, diarrhea, Cushing syndrome or carcinoid syndrome were not observed. Diagnosis was made after appendectomy and histological examination. The reported incidence of carcinoids in several studies ranges from 0.02 to 1.5% of surgically removed appendices.[18-20]

1.2% of case presented as acute appendicitis but had Meckel's diverticulitis as coexisting pathology. Meckel's diverticulitis can mimic acute appendicitis in clinical history, physical findings and operative findings. It is important to always consider this as possible cause of acute abdomen.[21]

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.

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