

SHOULD EVERY APPENDECECTOMY SPECIMEN BE SUBJECTED TO HISTOPATHOLOGICAL EXAMINATION? A RETROSPECTIVE STUDY OF HISTOLOGICAL FINDINGS IN APPENDICECTOMY SPECIMENS

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ABSTRACT

BACKGROUND

Appendicitis is one of the commonest surgical emergencies with a lifetime risk of 7-8%. The appendicectomy specimens operated upon clinically-suspected appendicitis often appear normal on gross examination, but histopathological evaluation may reveal a diverse underlying pathology. Therefore, for accurate diagnosis, histopathological examination of all appendicectomy specimens is mandatory.

MATERIALS AND METHODS

A retrospective study of 175 appendicectomy cases operated over a period of two years. The clinical data and histopathological reports were reviewed and various histopathological findings are categorised.

RESULTS

Out of the total 175 appendicectomies, 155 emergency appendicectomy cases were included in the study, while 20 cases of incidental appendicectomy were excluded. The peak incidence was found in the 2nd and 3rd decades with male predominance. Among the 155 specimens, 96.8% had histological features of appendicitis and 1.9% were normal appendix. The unusual histopathological findings were Carcinoid tumour and Enterobius vermicularis.

CONCLUSION

The definitive diagnoses of appendicitis as well as the unusual incidental findings that were missed intraoperatively are established by histopathological examination. The study supports the histological examination of all resected appendicectomy specimens.

KEYWORDS

Appendix; Appendicitis; Appendicectomy specimens; Histopathological findings.

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BACKGROUND

Acute appendicitis is one of the commonest surgical emergencies and appendectomy being performed most frequently worldwide.¹ Yet, 20% of the patients are misdiagnosed and undergo appendicectomy. The lifetime risk is 7%.² In developing countries like India, the incidence is rising probably due to the inclination towards the western diet.

The diagnosis of acute appendicitis is more of clinical and imaging modalities and scoring system like clinical Alvarado scoring system have increased the accuracy of diagnosis. But, even today, histopathological diagnosis

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remains the gold standard in confirming appendicitis and probably that could be the reason why appendix is one of the most commonly received specimens in the pathology department. The delay in the diagnosis of appendicitis can lead to complications like perforation, peritonitis, sepsis and increase in the morbidity and mortality.³

The routine practice of submission of appendicectomy specimens for histopathological examination differs with different institutions with variable reasons. Mathyssens et al suggests that appendix should not be sent routinely unless there is gross abnormality seen macroscopically in the appendix while operating.⁴ There is evidence that intraoperative normal appendix may have unusual incidental findings at histology and hence the practice of sending appendicectomy specimen for routine histopathological examination is justifiable.⁵

Aims and Objectives- To study the histopathological spectrum among the operated specimens of appendix who were clinically diagnosed as appendicitis. Analyse the various



lesions in appendectomy specimens and negative appendectomy rate.

MATERIALS AND METHODS

This is a retrospective study conducted at the Department of Pathology, PESIMSR, Kuppam, over a period of two years from January 2015 to December 2016. All the emergency appendectomies performed during the above period are included in the study. The specimens obtained from incidental appendectomies, which were done during other abdominal or pelvic surgeries are excluded from the study.

The relevant clinical details, gross findings and histopathology diagnosis were retrieved from the records of histopathology registers and computer database. The data was entered in MS Excel 2007 and statistical analysis was done using software STATA 14.

Grossly, the size of the appendix ranged from normal to enlarged. A few of them showed enlargement of the tip, fibrosis and scarring. The external surface showed congestion of the serosa. Cut section of some specimens showed narrow lumen, fecoliths and thickening of the walls.

The negative appendectomy was defined as postoperative specimen that did not show any evidence of appendicitis histopathologically.

RESULTS

A total of 175 specimens of appendix were received in the histopathology department during the two-year period as per the hospital records. Out of the total 175 appendectomies, there were 155 (88.6%) emergency appendectomies and 20 (11.4%) were incidental appendectomies, which were excluded as per the exclusion criteria.

Among the 155 patients, 103 were males and 52 were females with male:female ratio of 1.98:1 (Table 1). The youngest patient was 3 years old and the oldest was 70 years with mean age of 29 years ± 14.8 SD. The peak incidence was found to be in the 2nd and 3rd decade (Table 2).

Out of 155 specimens, 152 (98.0%) had features of various types of appendicitis, while 3 (1.9%) were normal appendix. The various histopathological findings seen in the appendectomy specimens are shown in Table 3.

The unusual histopathological findings observed were Carcinoid tumour, Enterobius vermicularis and Xanthogranulomatous appendicitis (Figure 1, 2 and 3).

Sex	Number of Patients	Percentage
Female	52	33.55
Male	103	66.45

Table 1. Sex Distribution of Appendectomy Cases (n=155)

Age Groups	Number of Cases	Percentage
0-10 years	13	8.38
11-20 years	41	26.45
21-30 years	43	27.74
31-40 years	27	17.41
41-50 years	16	10.32
>50 years	15	9.70
Total	155	100

Table 2. Distribution of Appendectomy Cases According to Age Group (n=155)

HPE Diagnosis	Number of Cases	Percentage
Acute appendicitis	71	45.80
Recurrent/follicular appendicitis	34	21.94
Chronic sclerosing appendicitis	15	9.70
Acute suppurative appendicitis	5	3.22
Gangrenous appendicitis	5	3.22
Acute appendicitis with abscess	5	3.22
Acute perforative appendicitis	14	9.05
Xanthogranulomatous appendicitis	1	0.64
Enterobius vermicularis	1	0.64
Carcinoid	1	0.64
Normal appendix	3	1.93
Total	155	100

Table 3. Varied Spectrum of Histopathological Diagnosis of Appendectomy Cases (n=155)

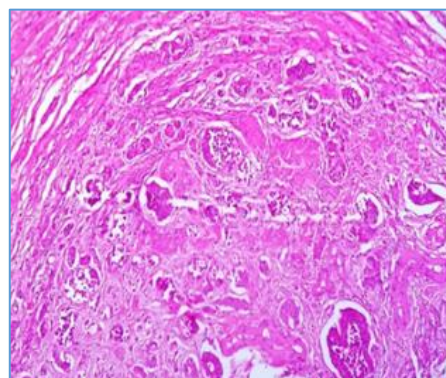


Figure 1. Carcinoid Tumour-Nesting (Insular) Growth Pattern (H and E x400)

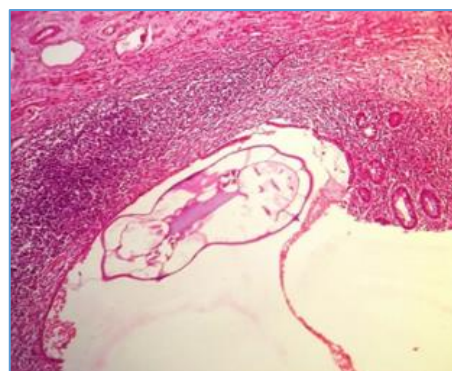


Figure 2. Parasite- Enterobius Vermicularis in the Appendiceal Lumen with Characteristic Cuticular Crests (H and E x400)

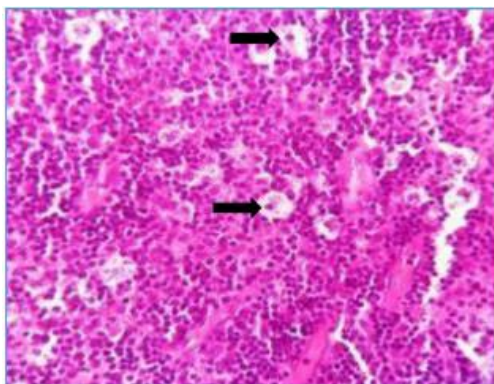


Figure 3. Foamy Macrophages in Xanthogranulomatous Appendicitis (H and E x400)

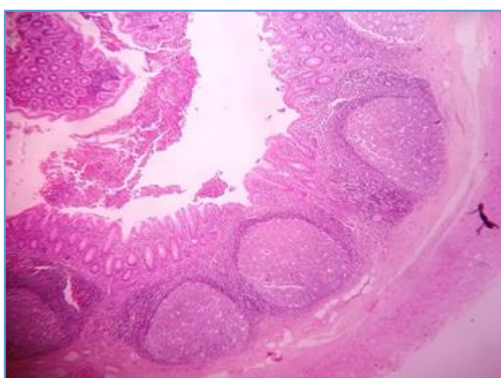


Figure 4. Lymphoid Follicular Hyperplasia in Recurrent Appendicitis (H and E x100)

DISCUSSION

The vermiform appendix is responsible for surgical exploration for suspected appendicitis. Even today, appendectomy still remains one of the commonest surgical procedures performed in the developing world.⁶

The diagnosis of appendicitis despite new imaging modalities remains a challenge to the operating surgeon. There is no laboratory test or examination with sufficient specificity and sensitivity to diagnose appendicitis consistently.⁷ However, histopathological examination still remains the gold standard for the confirmation of appendicitis.⁸

This retrospective study disclosed a spectrum of histopathological lesions in the resected appendectomy specimens. The incidence of appendicitis was higher in the 2nd and 3rd decade with male predominance, which is similar to other studies.^{3,6,8}

There are very few studies, which evaluates the benefits of analysing the appendectomy specimens. It is a routine practice at our institution to send all resected appendectomy specimens for histopathological examination. Many centres send the specimens only if they find gross abnormality during surgery.⁹ Such practices are likely to miss important diagnosis such as appendiceal tumours and abnormal pathological findings, which require further investigations or treatment.^{10,11} In a study done by Al-Mulhim AS showed that the clinical and macroscopic assessment of acute appendicitis correlated histologically only in 57.9% of the cases.⁵

The negative appendectomy rate in our study is 1.9%, which is very low in comparison to other studies 10.8%, 6.8% and 9.2%.^{6,12,13} The wide range of negative appendicitis rate falls between 6.1 to 34.2% by various studies.^{10,14} The acceptable negative appendicitis rate is 10-20%.⁸

In this study, the histopathological analysis of 155 cases showed acute appendicitis in 45.8%, while in other studies it was similar with 45.6%, 52% and 30.6%.^{6,8,12} The next more common cause of appendicitis in our study was recurrent appendicitis in 21.9%. The incidence of perforated appendicitis in our study was higher 9% compared to others with 1.9%, 2.1% and 2%.^{6,7,8} The higher incidence of perforation in our study could be attributable to delayed or missed diagnosis and late referral as all of these cases are from distant rural dwellings. The other histopathological findings were acute suppurative appendicitis, gangrenous appendicitis and acute appendicitis with abscess accounting to 3.2% each.

The incidence of unusual pathological findings in our study is low (1.9%), which was similar in the study of Omiyale AO et al (1.7%),¹⁵ whereas Hedy MS et al reported a higher incidence of 4.3%.¹ The unusual histopathological findings in our study are *Enterobius vermicularis* (0.6%), Carcinoid tumour (0.6%) and Xanthogranulomatous appendicitis (0.6%). Similar incidence of appendicitis due to Enterobiasis was reported by Duzgun et al 0.4%,¹⁰ but a higher findings by Nadir Mohammed et al 3.7%.¹² The incidence of carcinoid tumour found by others was not indifferent and is from 0.1%⁶ and 1.1%.¹⁶ It is rare for carcinoids to be diagnosed preoperatively. They are found incidentally during appendectomy.¹⁷

The histopathological examination confirmed acute appendicitis in most of the cases, the features being transmural neutrophilic infiltration and congested blood vessels with fibrinous exudates over the serosa. Suppurative appendicitis showed fecoliths in the lumen causing obstruction and abscess formation. Gangrenous appendicitis revealed ischaemic necrosis of the serosa. Periappendiceal abscess was observed in perforated appendix. Diffuse lymphoid hyperplasia was seen in recurrent appendicitis (Figure 4). Extensive fibrosis with chronic inflammatory reaction was noticed in the appendicular wall in chronic sclerosing appendicitis.

A systematic review by Swank et al justified the usefulness of routine histopathological examination of appendectomy specimens in view of low incidence of unusual findings in the literature.¹⁵ The intraoperative findings appear subjective and cannot eliminate the unusual histological findings such as tumour, parasites and therefore demanding histological evaluation.

CONCLUSION

The definitive diagnosis of appendicitis is established only by histopathological examination and can demonstrate unusual incidental histological findings such as tumours and parasites, which are missed clinically and intraoperatively.

Hence, it is mandatory to submit all resected appendectomy specimens for histopathological evaluation.

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