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Histopathological Study Of Appendicectomy Specimen In Rural Tertiary Care Centre.

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ABSTRACT

Various pathological lesions ranging from non-neoplastic to neoplastic tumours that may or may not obstruct the lumen can result in appendicitis. Normal looking appendicitis on gross may reveal different pathology on histopathological examination suggesting the need of histopathological investigation for excised appendix. Hence histopathological examination remains gold standard for appendicetomy specimens. To study various histopathological lesions in patients who underwent appendicectomy and and to study the clinicohistopathological correlation. This is a retrospective study of 830 appendicectomies carried out at JIIU's IIMSR Warudi, in Jalna district of Maharashtra. Relevant clinical details were obtained from the medical records of the specimens received in histopathology department of JIIU's IIMSR Warudi, Jalna. Haematoxylin and eosin slides made from paraffin blocks of these specimens were studied to identify different histopathological lesions in appendicectomy specimens. A total of 830 specimens were studied. 546 (65.78%) were males and 284 (34.21%) were females. The histopathological examination showed Acute appendicitis (81.32%), Chronic/recurrent appendicitis (12.05%), Acute suppurative appendicitis (3.01%) Gangrenous appendicitis (0.36%), Carcinoid tumor (0.36%), Parasitic infestation (0.36%), serrated adenoma (0.12%), mucinous adenocarcinoma (0.12%). Our study concluded that there is high incidence of appendicitis in males than in females in their second and third decade of life. Interesting finding such as mucinous adenocarcinoma, neuroendocrine tumors, LAMN were identified in this study, suggesting the need of histopathological investigation for excised appendix. Such findings can affect the course of treatment of patient. It can be concluded that histopathological examination is the gold standard for diagnosing appendiceal lesions.
Keywords: Appendicectomy, tumours, histopathology, appendix.

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INTRODUCTION

The vermiform appendix is a tubular structure arising from the medial wall of the cecum; it averages 9 cm in length and 0.7 cm in greatest diameter. Vermiform appendix has no known function in humans and is typically regarded as a vestigial organ. The appendix reaches its maximum diameter by 4 years of age and becomes narrower (particularly after age 40) as lymphoid tissue decreases and fibrosis increases.[1]The appendix most often lies posterior to the cecum or ascending colon, below the ileocecal valve. Other appendiceal locations include retroileal, preileal, pelvic, and in the hepatorenal recess [1].

Congenital abnormalities of the appendix are fairly rare and include appendiceal agenesis, duplication, and congenital diverticula [2].

Appendicitis is most common in adolescents and young adults, with a lifetime risk of 7%; males are affected slightly more often than females [3].

Percentage of appendicitis is raised in India and other developing countries due to western diet[3].

One of the commonest causes of sudden abdominal pain in adults and children is appendicitis[4]. Incidence of acute appendicitis in world is 96.5 to 100/100,000 per year [4].

Appendicitis can be obstructive or nonobstructive. Different causes for this condition have been identified but luminal obstruction is one of the main causes of acute appendicitis [3, 4]. Common obstructive lesions are FB, faecolith, lymphoid hyperplasia. Other uncommon causes can be enterobiasis, ascariasis, TB, tumor like carcinoid, lymphoma, GIST, adenocarcinoma [5].

Diagnosis of acute appendicitis is difficult to make on clinical examination regardless of availability of diagnostic tool. Histopathological examination remains gold standard for confirmation of appendicitis.

Aim of present study

Is to study various histopathological lesions in patients who underwent appendicectomy and correlate with clinical diagnosis.

MATERIAL AND METHODS

This was a observational, cross-sectional study done between January 2019 to December 2023 in department of Pathology of JIIU's IIMSR, Warudi, in Jalna district of Maharashtra. Approval of Institutional ethical committee was obtained for this study. The histopathological specimen of the patients who underwent appendicectomy were included in the study. Total 830 samples were received in our department. Specimens were fixed in 10% formalin. Relevant clinical details were obtained from the medical records. Detailed gross finding were noted and representative sections were submitted. The tissue was processed in fully automated processing unit, blocks prepared, 3-5 microns tissue sections were cut by Leica microtome and the sections were stained with Haematoxylin and Eosin stain. Slides were reported by atleast two pathologists and histopathological diagnosis was finalized. The details of the patients and data were kept confidential. The data was analysed using MS Excel worksheet.

RESULTS

830 appendicectomy specimens were received in the pathology department for a study period of 4 years from January 2019 to December 2023. Out of these patients, 546 were males and 284 were females, thus making a male: female ratio of 1.9 :1. [Table 1] Among these 830 cases, 822 cases are histologically proven appendicitis. Most of the cases i.e.702 out of 803 cases presented clinically as acute appendicitis followed by recurrent appendicitis (128). [Table 2].

The histopathological examination showed Acute appendicitis (81.32%), Chronic/recurrent appendicitis (12.05%), Acute suppurative appendicitis (3.01%) Gangrenous appendicitis (0.36%), Carcinoid tumor (0.36%), Parasitic infestation (0.36%), serrated adenoma (0.12%), mucinous adenocarcinoma (0.12%).

In this study, about 13 cases showed interesting findings, 5 cases showed intraluminal parasite (Enterobius vermicularis.) Carcinoid tumor of appendix was found in 3 cases.

3 cases of low-grade mucinous neoplasia were diagnosed. One case of serrated adenoma and one case of mucinous carcinoma were detected.

These 13 cases had incidental finding on histopathological examination but were clinically diagnosed as acute/recurrent appendicitis. So, histopathological diagnosis remains gold standard for confirmation of diagnosis and had considerable impact on patient management. [Table 2]

Table 1: Age and gender specific distribution in appendicectomy patients.

Age (Years)	Males	Females	Total	Percentage
0-9	4	1	5	0.60
10-19	55	23	78	9.39
20-29	170	98	268	32.28
30-39	130	65	195	23.49
40-49	77	47	124	14.93
50-59	65	26	90	10.88
60-69	45	25	70	8.43
Total	546 (65.78 %)	284 (34.21%)	830	100%

Table 2: Clinical and histopathological diagnosis correlation of appendicectomy specimen

Clinical diagnosis	Histopathological diagnosis	No of cases	%
Acute Appendicitis (702 cases)	Acute appendicitis	675	96.15
	Acute appendicitis with perforation	2	0.28
	Acute suppurative appendicitis	25	3.57
Recurrent appendicitis (128 cases)	Recurrent appendicitis	100	78.12
	Fibrous obliteration	8	6.25
	Enterobius vermicularis	5	3.92
	Xanthogranulomatous appendicitis	3	2.35
	Granulomatous appendicitis	1	0.78
	Gangrenous appendicitis	3	2.34
	Neuroendocrine tumor	3	2.34
	Low grade mucinous neoplasia	3	2.34
	Serrated adenoma	1	0.78
	Mucinous Carcinoma	1	0.78

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Table 3: Distribution of appendicectomy specimens.

Specimen	Cases	%
Non neoplastic lesions	822	99.03
Neoplastic lesions	8	0.97

Table 4 Histopathological diagnosis of 830 appendicectomy specimen

Acute appendicitis	675	81.32
Acute appendicitis with perforation	2	0.24
Acute suppurative appendicitis	25	3.01
Recurrent appendicitis	100	12.05
Fibrous obliteration	8	0.96
Enterobius vermicularis	5	0.60
Xanthogranulomatous appendicitis	3	0.36
Granulomatous appendicitis	1	0.12
Gangrenous appendicitis	3	0.36
Neuroendocrine tumor	3	0.36
Low grade mucinous neoplasia	3	0.36
Serrated adenoma	1	0.12
Mucinous Adenocarcinoma	1	0.12

DISCUSSION

Acute appendicitis is the most commonly encountered surgical emergency. 40% of all surgical emergencies in the western world are caused by appendicitis[1]. It is not common in Asian and African countries. Because of western diet and lifestyle, recent studies show that there is an increase in amount of appendicitis in African countries [2]. Incidence of appendicitis differs considerably by geographic region, socio-economic status, dietary habits, and hygiene country, race, age, sex [3] .Acute appendicitis was first recognized as a clinical diagnosis by Reginald Fitz [4]. Afterwards, Charles Mc Burney described the clinical signs of acute appendicitis including the point of maximum tenderness in right iliac fossa, that's how it has given his name [5]. The histopathological examination of the appendix has two purposes [6]. First it gives confirm diagnosis of appendicitis, second, it can provide additional pathologies that may not be seen intraoperatively but may impact patient management [6].

The current study was done for a period of 5 years and shows the histopathological findings of 830 appendicectomy specimens received in the Pathology Department, JIIU's IIMSR medical college, Warudi, Badnapur.

Maximum number of patients (33.28%) who underwent appendicectomy were of age group of 20-29 years [Table 1], which is similar with the study done by R.Sujatha etal.which also showed that most of the appendicectomies ((53.5%) were done in the second decade of life [3].

Percentages of appendicectomies done were more in males 546 (65.78%) as compared to females 284 (34.21%) which were consist with study done by Zulfikar et al. who studied 323 cases of appendicectomies, in which 196 (60.7%) were males and 127 (39.3%) were females [6].

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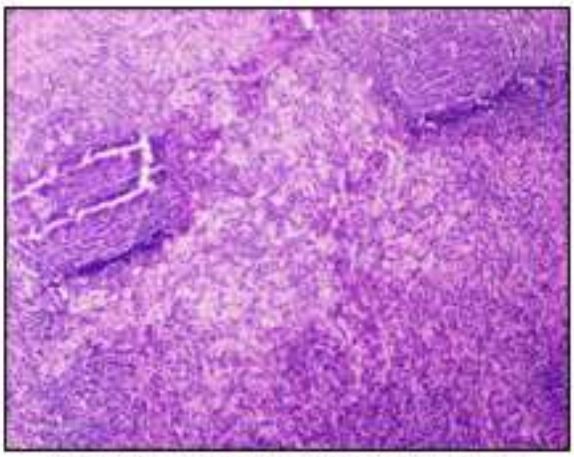
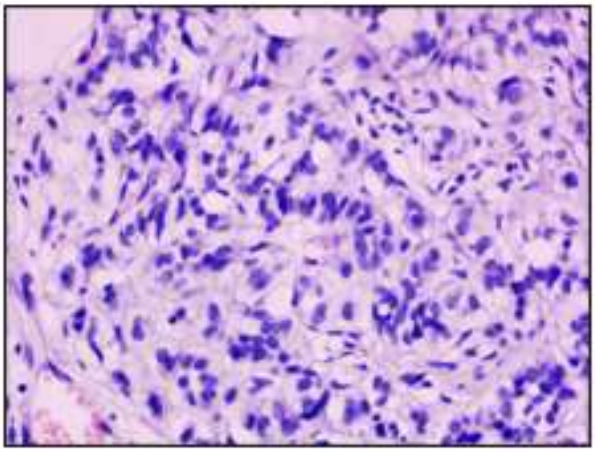
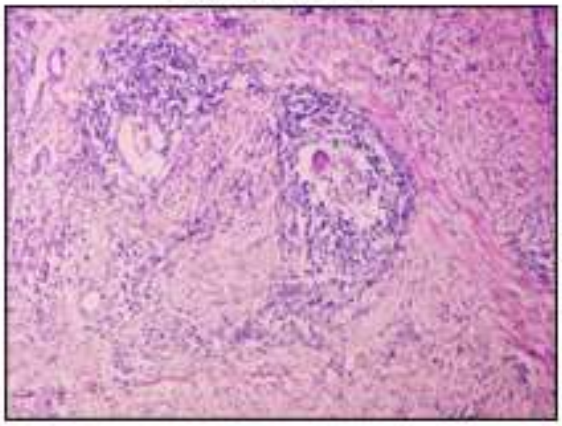


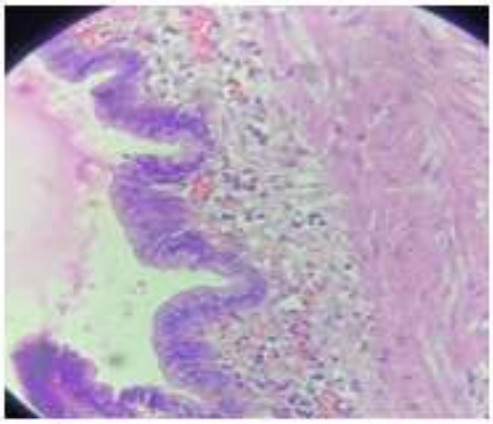
Microscopic picture showing large number of foamy histiocytes admixed with lymphocytes in section of appendix (H&E 10X)



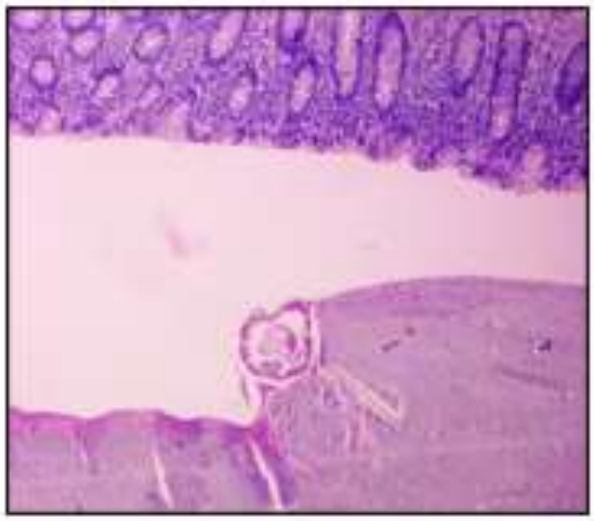
Microphotograph of carcinoid tumor ~~and~~Microscopic picture showing large number of foamy histiocytes admixed with lymphocytes in section of appendix (H&E 10X)



Microscopic picture showing well formed granulomas in the section of appendix (H&E 10X)



Low grade mucinous appendicial neoplasia [LAMN].



Microscopic picture showing Enterobius vermicularis in lumen of appendix (H& E 10X)

Out of 830 appendicectomy specimens, 822 (99.03%) were non-neoplastic lesions and only 08 (1.8%) cases were diagnosed as neoplastic lesions. [Table 3]. In study done by Blair et al. it was reported that 80% of appendicectomy cases were non-neoplastic lesions and 4% were neoplastic [7].

In the current study, acute appendicitis was the most common histopathological diagnosis and was seen in 81.32% of patients. These findings were similar with the study done by Blair et al [7] and Edino et al [8]. Recurrent appendicitis is the second most common lesion, seen in 12.05% cases [7]. Acute suppurative appendicitis was diagnosed in 25 (3.01%) patients.

Appendiceal tumors are very rare and mostly present as appenditicitis [9]. In this study 0.97% are of neoplastic origin consisting of carcinoid, low grade mucinous neoplasm, seraated adenoma, mucinous carcinoma. Carcinoid tumours in majority of cases are asymptomatic and have incidental finding during histopathological examination [9].

In this study the presence of E. vermicularis was found in 5 cases in appendicitis(0.60%). This finding aligns with another study by Sujatha R et al., which reported three cases (1.3%) presenting with symptoms similar to acute appendicitis. The incidence of E. vermicularis worldwide ranges from 0.2-41.8% [10].

In our study 3 cases (0.36%) of carcinoid were found which showed tumour in insular, solid island growth pattern of uniform polygonal cells with minimal pleomorphism. Similar findings were seen in the study done by Hof et al which showed 07(0.47%) cases [11].

In our study,3 cases of low grade mucinous neoplasia were noted. On microscopy, it showed mucinous epithelial cells originating from lumen with abundant apical mucin with elongated nuclei and low-grade nuclear atypia. Atrophy of lymphoid tissue with effacement of muscularis mucosae was also identified.

1 case of serrated adenoma was identified which showed localized serrated epithelial lesion within luminal appendix.

In present study,1 case of mucinous adenocarcinoma was detected. Microscopy showed extracellular mucin, irregular glands inflitrating appendiceal wall with cluster of tumor cells floating in mucin pool.

Symptomatic presentation of tumors is smilar to appendicitis because of luminal obstruction leading to increase level of histamine, serotonin causing inflammation [12, 14].

In this study, most common gross finding was obstruction of lumen with faecolith followed by mucosal congestion.These findings were similar with the study done by Majid et al who found mucosal congestion was the commonest finding in 218 cases [13, 15, 16].

These 13 cases had incidental finding on histopathological examination but were clinically diagnosed as acute/recurrent appendicitis. So, histopathological diagnosis remains gold standard for confirmation of diagnosis and had considerable impact on patient management.

CONCLUSION

Our study concluded that there is high incidence of appendicitis in males than in females in their second and third decade of life. Interesting finding such as mucinous adenocarcinoma, neuroendocrine tumors, LAMN were identified in this study, suggesting the need of histopathological investigation for excised appendix. Such findings can affect the course of treatment of patient. It can be concluded that histopathological examination is the gold standard for diagnosing appendiceal lesions.

REFERENCES

[1] Rosai J. Rosai and Ackerman's surgical pathology e-book. Elsevier Health Sciences; 2011 Jun 20. Chapter 16 Appendix, page no.617

[2] Turner JR. The Gastrointestinal tract, In: Kumar, Abbas, Fausto(eds). Robins and Cotran Pathologic basis of disease.10th edn. Saunders: Philadelphia; 2010.pp870-1.
[3] Sujatha R, Anushree CN, Singh N. Histopathological spectrum of appendicectomy specimens-a prospective study. Indian J Pathol Oncol 2017;4(4):638-42.
[4] Sujatha R, Anushree CN, Singh N. Histopathological spectrum of appendicectomy specimens-a prospective study. Indian J Pathol Oncol 2017;4(4):638-42.
[5] Gholap P, Ghanghurde SB, Dhakare P. Histopathological Spectrum of Appendicular Lesions: A Cross-sectional Study. Journal of Clinical & Diagnostic Research 2024;18(1).
[6] Emre A, Akbulut S, Bozdag Z, Yilmaz M, Kanlioz M, Emre R, Sahin N. Routine histopathologic examination of appendectomy specimens: retrospective analysis of 1255 patients. International Surgery 2013;98(4):354-62.
[7] Zulfikar I, Khanzada TW, Sushel C, Samad A; Review of the pathologic diagnoses of appendectomy specimens. Annals of King Edward Medical University 2009;15(4):168-170.
[8] Blair NP, Bugis SP, Turner LJ, Macleod MM; Review of pathological diagnosis of 2216 appendectomy specimens. Am J Surg 1993;165(5):618-620.
[9] Edino ST, Mohammed AZ, Ochicha O, Anumah M; Appendicitis in Kano, Nigeria: A 5year review of pattern, morbidity and mortality. Annals of African Medicine 2004;3(1):38-41.
[10] Dafle VD, Das A, Jagtap SV, More SS, Boral S, More VA. Clinico-pathological study of appendicectom y specimens. Indian J Pathol Res Pract 2020; 9:221-7.
[11] Aydin O. Incidental parasitic infestations in surgically removed appendices: A retrospective analysis. Diagn Pathol 2007;2:16.
[12] In't Hof KH, Van Der Wal HC, Kazemier G., Lange JF; Carcinoid tumor of the appendix. Analyses of 1485 consecutive emergency appendicectomies J Gastrointest Surg 2008;12(8):1436-1438.
[13] Cortina R, Mc Cormick J, Kolm P, Perry RR.Management and prognosis of adenocarcinoma of the appendix.Dis Colon Rectum 1995;38:848-52.
[14] Majid S, Imran AA Khan SA; Morphological variations in appendectomy specimens. Pak J Pathol 2005;16(2):58- 60.
[15] KP Aravindan, Deepthy Vijayaraghavan, Marie Therese Manipadam. Significance of eosinophil-edema lesion. Indian J Pathol Microbiol 2010; 53:258-61.
[16] Aravindan KP. Eosinophils in acute appendicitis: Possible significance. Indian J Pathol Microbiol 1997; 40:491-8.