ORIGINAL RESEARCH PAPER
Volume-9 | Issue-4 | April-2020 | PRINT ISSN No. 2277 - 8179 | DOI : 10.36106/ijsr
INTERNATIONAL JOURNAL OF SCIENTIFIC RESEARCH

HISTOPATHOLOGY AND CLINICAL CORRELATION OF APPENDECTOMY SPECIMENS

Anatomy

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ABSTRACT

Objectives - To co-relate the histopathological diagnosis with gross examination and clinical diagnosis in cases of appendicitis

Methods - A study was conducted over a period of 6 months in 39 cases of appendectomy. The study included detailed clinical history, physical examination and relevant blood and radiological investigations.

Results - Out of the 39 appendectomy specimens, 20 cases were found in males and 19 in females. Most cases (35.89%) were found in the age group 21 to 30 years. The histopathological diagnosis was Acute appendicitis in 17 (43.58%) cases, Acute gangrenous - 5 cases (12.82 %), Recurrent -2 cases (5.12%) & Chronic appendicitis – 15 cases (38.46%).

Summary - Confirmation of the clinical and radiological diagnosis by histopathological diagnosis is necessary in all cases of appendectomy to rule out the diagnosis other than the routine cases.

KEYWORDS

Histopathology, Appendectomy, Acute appendicitis, Chronic appendicitis

INTRODUCTION

Acute appendicitis is the most common general surgical emergency [1]. In England 42,526 patients underwent appendicectomies in the year 2004–5 with a mean age of 28 years [2]. Approximately 20% of those undergoing appendicectomes are found not to have acute appendicitis at surgery [3–6], with this being more common in females than males and approaching a ratio of 3:1 in the 15–19 age group [7].

Clinical findings form the basis for diagnosis which may be consolidated by blood tests such as C-reactive protein and white cell count, and management is early appendicectomy [8]. The practice of sending appendicectomy specimens for histopathological analysis varies [9]. Whereas it is recognised that many resected specimens in general surgery need not be sent, there are as yet no guidelines as to whether all appendices should be sent as a matter of routine [10]. Matthyssens et al suggest that appendices should not routinely be sent unless there is an obvious macroscopic abnormality at surgery [9]. They argue that this practice is justified by the rarity of aberrant findings, together with the significant costs of specimen processing, an ever increasing issue in the current financial climate. However, a number of previous papers have found aberrant incidental findings to be more common, suggesting that this latter method has the potential to miss significant pathologies which may impact on patient management [11–16].

Acute appendicitis is one of the most common abdominal emergencies worldwide. The cause remains poorly understood, with few advances in the past few decades[1]. Routine pathological examination of appendectomy specimens is expensive. With advances in technology and imaging modalities, the diagnosis of acute appendicitis has improved, with a subsequent significant reduction in negative appendectomy. There are still a number of unusual diagnoses found in appendicectomy specimens supporting the continued use of routine histology.

Aims & Objectives

- To study the prevalence with respect to age, sex and clinical symptoms of Appendix
- To study the relevance of histological evaluation of Appendix

MATERIALS

- 39 specimens of Laparoscopic appendectomies
- Period of study – 6 months (November 2017 to April 2018)
- Details of the cases were studied under the following headings:

1. Age & Sex
2. Clinical history
3. Investigations
4. Gross features
5. Histopathology
6. Final diagnosis

METHODS

- Fixation - 10% formalin for 24-48 hrs.
- Tissues - Taken from the pathological lesions
- Processing - Yorco Automatic Tissue Processor
- Paraffin blocks
- Sectioning
- Staining
- Labelling and Mounting
- Study of the slide

Observations

Table 1- Age Distribution

Age group	No. of cases	Percentage
0-10	3	7.69
11-20	5	12.82
21-30	14	35.89
31-40	10	25.64
41-50	5	12.82
51-60	0	0
61-70	2	5.12

Table 2 – Sex distribution

Sex	No. of cases	Percentage (%)
Female	19	48.71
Male	20	51.28

Table 3: Common presenting symptoms

Sr. No.	Symptom	No. of cases	Percentage (%)
1	Vague peri-umbilical pain	24	61.53
2	Nausea	18	46.15
3	Vomiting	21	53.84
4	High grade fever with chills	22	56.41
5	Pain localized in right iliac fossa	15	38.46

Table 4 - Common signs seen

Sr. No	Sign	No of patients	Percentage (%)
1	Generalized i) Fever ii) Tachycardia	24 24	61.53 61.53
2	Localized I) Guarding in right iliac fossa, ii) Rebound tenderness at Mc Burney's point, iii) Rovsing's sign, iv) Cope Psoas sign	15 12 3 1	38.46 30.76 7.69 2.56

Table 5 – Histopathological changes

Histopathological diagnosis	No. of cases	Percentage

1.	Acute appendicitis	17	43.58
2.	Acute gangrenous appendicitis	5	12.82
3.	Recurrent appendicitis	2	5.12
4.	Chronic appendicitis	15	38.46

Figure 1 & 2 – Acute Appendicitis

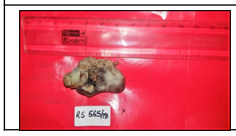
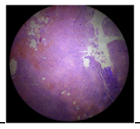
Gross		Microscopic
External Surface - Focal exudates present - Haemorrhagic areas present - Perforation present - Soft & friable	Cut Surface - Lumen distended - Filled with necrotic debris - Wall thinned out	1. Exudates in lumen 2. Ulcerated mucosa 3. Transmural coagulative necrosis 4. Transmural haemorrhages 5. Transmural acute inflammation 6. Serosal exudates 7. Acute inflammation in periappendiceal fat
		

Figure 3 & 4 – Recurrent Appendicitis

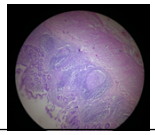
Gross		Microscopic
External Surface - Congested	Cut Surface - Faecolith - Wall thickened	1. Focal mucosal ulceration 2. Hypertrophied lymphoid follicles – submucosa 3. Transmural congestion 4. Transmural fibrosis 5. Transmural inflammation (eosinophils, lymphocytes & plasmacells) 6. Serosa congested 7. Organised fibrin on serosal aspect
		

Figure 5 & 6 – Chronic Appendicitis

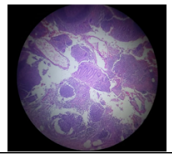
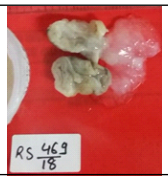
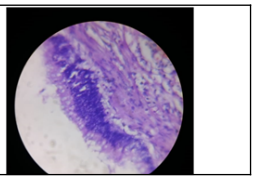
Gross		Microscopic
External Surface - Pale - Slender - Congested	Cut Surface - Lumen obliterated partially/completely - Wall thinned out	1. Focal mucosal ulceration 2. Hypertrophied lymphoid follicles – submucosa 3. Transmural congestion 4. Transmural fibrosis 5. Transmural inflammation (eosinophils, lymphocytes & plasmacells) 6. Serosa congested 7. Organised fibrin on serosal aspect
		

Figure 7 & 8 – Low grade Appendiceal Mucinous Neoplasm (LAMN)

Gross		Microscopic
External Surface - Dilated - Serosa appears smooth	Cut Surface -Mucin filled lumen	1. Normal appendicular lining is replaced by dysplastic lining (mucin secreting epithelium) 2. Nuclear stratification, overcrowding, hyperchromasia, pleomorphism seen 3. Mucin seen dissecting into submucosa

Out of the 39 appendectomy specimens, 20 cases were found in males and 19 in females. Most cases (35.89%) were found in the age group 21 to 30 years. Acute appendicitis was the histopathological diagnosis in 17 (43.58%) cases. The other cases were diagnosed as Acute gangrenous - 5 cases (12.82 %), Recurrent -2 cases (5.12%) & Chronic appendicitis – 15 cases (38.46%).

DISCUSSION

The histopathological examination of the appendix serves two purposes. First, it allows the diagnosis of acute appendicitis to be confirmed, especially where this is not evident intra-operatively. Second, histopathological examination may disclose additional pathologies that may not be evident on gross examination intra-operatively but may affect subsequent clinical management of the patient. Specimens reported as negative for acute appendicitis are useful in eliminating acute appendicitis as a cause of symptoms and allowing further investigations to be performed should symptoms persist. Even in these negative appendicitis cases, patients' symptoms frequently disappear post-operatively. It has been suggested that in these cases there may be an early sub-clinical appendicitis [13].

The examination of certain surgical specimens, such as hernia sacs, and "doughnuts" following rectal surgery, does not yield further useful information and is unnecessary [9, 10]. However, there are very few studies, which evaluate the benefits of analysing appendicectomy specimens. As a result, some centres, including this one, send all resected appendices for histopathological analysis. Other centres send specimens only if they appear macroscopically abnormal at the time of surgery [9]. This latter practice has the potential to miss important diagnoses which may subsequently affect patient management and is illustrated in our study, where evaluation of the histopathology reports of 1225 specimens revealed 46 unexpected findings of which 24 were clinically significant. Other authors have similar experiences. Polat et al report an intra-operative detection rate of less than 50% for all types of appendiceal tumour [12]. Deans et al, suggested that surgeons missed abnormal pathological findings in 10 out of 13 patients, the majority of which required further investigation or treatment [15].

CONCLUSION

- Confirmation of the clinical and radiological diagnosis by histopathological diagnosis is necessary in all cases of appendectomy to rule out the diagnosis other than the routine cases.
- First, it allows the diagnosis of acute appendicitis to be confirmed, especially where this is not evident intra-operatively.
- Second, histopathological examination may disclose additional pathologies that may not be evident on gross examination intra-operatively but may affect subsequent clinical management of the patient.

Conflict of interest - None

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