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A PLETHORA OF HISTOPATHOLOGY FINDINGS OF APPENDICECTOMY SPECIMEN ANDITS USE AS AN AUDIT FOR NEGATIVE APPENDICETOMY RATE

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ABSTRACT **Introduction:** The accuracy of clinical diagnosis of acute appendicitis is 80%. Histopathology is gold standard for diagnosis. Measurement of negative appendicectomy rate is a part of surgical audit. **Aim**: To evaluate histopathology of resected specimens in clinically diagnosed acute appendicitis cases and negative appendicectomy rate at our hospital. **Material and methods:** A retrospective study was done to evaluate all patients from January 2010 to January 2015 with a clinical diagnosis of acute appendicitis with regard to their histopathology findings. The data was compiled and evaluated using appropriate statistical methods. **Observtion and Results:** Histopathology confirmed appendicitis as acute inflamed appendicitis{160, 53.33%}, resolving appendicitis{100, 33.33%}, normal appendix {32,10.66%}, perforated appendix{30,10.0%}, gangrenous appendicitis{5, 1.66%}, xanthogranulomatous{4, 1.33%} and tubercular{1, 0.33%}. The negative appendicectomy rate in our hospital is 9.64%. **Conclusion:** All appendicectomy specimens should be routinely subjected to histopthological evaluation. The negative appendicectomy rate is a means of institutional surgical audit outcome measure.

KEYWORDS : Appendicitis, Surgical audit, histopathology

INTRODUCTION

Acute appendicitis develops between 5 and 10 % of the population with peak incidence noted in the second and third decade of life(1). A timely surgery is preferable to prevent morbidity and mortality, which is about 2% when associated with perforation.[2]

Clinically a diagnosis of acute appendicitis can be clinched in 80% of cases but the remaining 20% have atypical presentations and pose a diagnostic challenge. Radiological imaging such as ultrasonography and contrast enhanced computed tomography (CECT) abdomen are helpful in making a diagnosis and excluding other causes of abdominal pain. But, despite these technological advances, the diagnosis of appendicitis still remains essentially clinical[3]

It is imperative to confirm the diagnosis by performing the histopathological examination of surgically removed appendix, which is considered the gold standard for diagnosis of acute appendicitis.(4) Also the negative appendicectomy rate is a means of audit and hence essential.

AIM

This study was done to identify the various types of histopathological findings in patients of acute appendicitis undergoing emergency appendicectomy, using it as a measure to confirm the preoperative diagnosis and audit the rate of negative appendicectomy over a three year period.

MATERIALS AND METHODS

This was a retrospective study carried out at a university college hospital in Delhi and included all patients who underwent emergency appendicectomy with diagnoses of acute appendicitis from January 2010 to January 2015.

All patients over 18 years of age who presented to the surgical emergency department with a clinical diagnosis of acute appendicitis underwent routine blood investigations (including complete blood count, liver and kidney function test, amylase and blood sugar), chest and abdominal radiograph and ultrasonography of abdomen.

The diagnosis of acute appendicitis was suggested on ultrasound by the presence of an aperistaltic, non-compressible tubular structure arising from the caecum with target appearance on transverse section with an outer diameter of > 6 mm and a wall thickness > 3 mm. USG was considered negative for appendicitis when the appendix could not be visualized or if other pathology was found for the cause of pain in the right iliac fossa.

A CECT abdomen was done wherein the diagnosis could not be made on the basis of clinical or ultrasonographic evaluation. The histopathological diagnosis was considered as the gold standard for the diagnosis of acute appendicitis. Patients underwent appendicectomy on the basis of the surgeon's final impression after collaborating the clinical findings and test results.

The histopathology reports were studied for details of the gross and microscopic characteristics. The specimens were stained with hematoxylin and eosin for routine examination and special staining was used for selected specimens based on suspicion of alternative diagnosis.

For purpose of this study, acute appendicitis is defined as the presence of transmural inflammation or pus in the lumen of the appendix. Negative appendicectomy is defined where the appendix is found to be normal on histopathological examination. A diagnosis of appendicular perforation peritonitis is made if the exudate extends into the fibrofatty tissues of the meso-appendix along with evidence of appendicular perforation. Non-perforated appendicitis was defined as an inflamed appendix without evidence of macroscopic perforation.

After completion of the study, data collected were compiled and appropriate statistical tools were used to find out the significance of the variables.

OBSERVATIONS AND RESULTS

A total of 412 patients were admitted with a clinical suspicion of acute appendicitis and were subjected to further evaluation. Of these 412 patients, 332 had undergone appendectomy after collaboration of clinical findings with imaging and biochemical findings. Ultrasound and CECT abdomen were suggestive of acute appendicitis in 300 and 02 patients respectively, while the remainder (30) were operated on the basis of clinical suspicion. Of the patients not operated, alternative diagnosis of ureteric calculi, ovarian cyst, right ectopic pregnancy and abdominal tuberculosis were commonly found as a cause of their symptoms.

In our study, mean age of patients was 25 years (19-32 years). Acute appendicitis was more commonly seen in male patients (182 cases, 55.1%), with a male to female ratio of 1.21:1. All patients presented with abdominal pain, with mean duration of symptoms of 2.5 days(1-4days) . Intraoperative findings in the cases are summarised in table 1.

OPERATIVE FINDINGS	NO. OF CASES
Acutely Inflammed Appendicitis	262
Perforated Appendicitis	30
Normal Looking Appendix	30
Appendicular Lump(interval appendicectomy)	5
Gangrenous Appendicitis	5
TOTAL	332

Table 1: Intraoperative findings during emergency appendicectomy

Histopathology confirmed appendicitis as acute inflamed appendicitis{160, 53.33%}, resolving appendicitis{100, 33.33%}, normal appendix {32,10.66%}, perforated appendix{30,10.0%}, gangrenous appendicitis{5, 1.66%}, xanthogranulomatous{4, 1.33%} and tubercular{1, 0.33%}. The histopathological findings are summarised in table 2.

HISTOPATHOLOGICAL FINDINGS	NO. OF CASES
Acutely inflammed Appendicitis	160
Resolving Appendicitis	100
Normal Appendix	32
Perforated Appendicitis	30
Gangrenous Appendicitis	5
Xanthogranulomatous Appendicitis	4
Tuberculous Appendicitis	1
TOTAL	332

Table 2: Histopathologcial findings of apendicectomy specimen.

Histopathology thus confirmed acute appendicitis in 300 patients amongst the 332 patients operated with diagnosis of acute appendicitis. Hence the negative appendicectomy rate in our hospital is 9.64% over the past three years.

DISCUSSION

Acute appendicitis is a common, frequently atypical and a challenging clinical diagnosis. Despite major technological advances and new diagnostic techniques, history taking and clinical examination is still the most important step in the work up of patients with right iliac fossa pain.[4]

Despite being the most common problem requiring emergency surgery, the accuracy of the clinical diagnosis has been estimated between 76 % and 92% and hence accurate diagnosis of acute appendicitis is still difficult.[4]

Our study showed that acute appendicitis was more commonly seen in male patients (182 cases, 55.1%). Similar finding was reported in other literature.(4,6) Male: Female ratio in our study is 1.21:1 comparable to findings in other studies.

Histopathology still remains the gold standard for the diagnosis of acute appendicitis. On histopathology, there are generally five reporting categories: Normal appendix, Established acute inflammation; mucosal ulceration, often with mural necrosis and a serosal inflammatory response; features suggestive of early inflammation, focal true mucosal ulceration with polymorphs; serosal/peri-appendicular inflammation (usually with polymorphs) with no evidence of any appendiceal mucosal/submucosal inflammation; other features, such as granulomatous appendicitis, Enterobius vermicularis, tumours, etc.[5]

In our study, Histopathological diagnosis of acute appendicitis was given in 53.33%, appendicular perforation in 10.00% and gangrenous appendicitis in 1.66% whereas in a similar study by Nabipour et al, the similar findings are given in 48.26%, 0.8% and 8.0% respectively (7) and in a study by Subedi et al, appendicular perforation was seen in 7.5% cases and gangrenous appendicitis in 3.5%. (4) The rate of resolving appendicitis was 33.33% in our study and 34.75% in study by Nabipour et al.

Granulomatous inflammation of appendix due to tuberculosis occurs only in 0.1% to 3% cases of all appendectomies (8). Comparably in our study, granulomatous inflammation consistent with tuberculosis was seen in one case (0.33%). Also Xanthogranulomatous variety was seen in 1.33% of our cases. No cases of carcinoid appendix were seen in this series and no patients had malignancy of appendix which has been incidentally found in some other series.

The rate of negative appendicectomy in our study is 9.64% which is comparable to some other long term studies. Charfi et al published their results in 2014(9) and had a negative appendicectomy rate of 15%, while Subedi et al reported their negative appendicectomy rate as 9.1%[4].

Hence in the remaning cases wherein the histopathology reveals normal appendix or an alternative histopathological diagnosis, appropriate further diagnostic tests should be done to identify the cause of the patient's symptoms and treatment instituted accordingly. If there is peri-appendicitis only, then an alternative cause for the peritonitis must be sough, like pelvic inflammatory disease in females. If the appendix exhibits no inflammation at all ("normal") then, again, the cause for the symptoms probably lies outside of the appendix. Entities like Crohn's disease, Enterobius vermicularis, Tuberculosis should be looked for in such cases.[5]

CONCLUSIONS

All appendicectomy specimens should be routinely subjected to histopthological evaluation as it remains as the gold standard for diagnosing acute appendicitis. All cases with normal appendix on histopathological examination should be evaluated further to find out the cause of their abdominal pain and managed accordingly.

Histopathological examination also provides a measure of the negative appendicectomy rate as a means of surgical audit outcome measure.

REFERENCES

1. C.P. Driver, G.G. Youngson. Acute abdominal pain in children: A 25-year comparison. Health Bull. (Edinb.) 1995;53:167.
2. J.M. Wagner, W.P. McKinney, J.L. Carpenter. Does this patient have appendicitis? JAMA 1996;276:1589-94.
3. M.D. Deutsch, G.R. Leopard. Ultrasonic demonstration of inflamed appendix. A case report. Radiology 1981;140:163-4.
4. Subedi N, Dangol US, Adhikary MB, Pudasaini S, BaralR : Acute appendicitis: a 2- year review of clinical presentation and histopathology. Journal of pathology of Japan(2011) Vol.1, 104-107
5. Herd ME, Cross PA, Dutt S. Histological audit of acute appendicitis. J Clin Path 1992;45:456-8.
6. Makaju R, Mohammad A, Shakya A. Acute appendicitis: analysis of 518 histopathologically diagnosed cases at the Kathmandu university Hospital, Nepal. KUMJ 2010;8:227-30
7. Nabipour F. Histopathological feature of acute appendicitis in Kerman Iran from 1997 to 2003. Am J Environ Sci 2005;1:130-2
8. Gupta S, Kaushik R, Kaur A, Attri AK. Tubercular appendicitis-a case report. World J Emerg Surg. 2006;1:22.
9. Charfi S, Sellami A, Affes A, Yaïch K, Mzali R, Boudawara TS. Histopathological findings in appendectomy specimens: a study of 24,697 cases. Int J Colorectal Dis. 2014 Aug;29(8):1009-12. doi: 10.1007/s00384-014-1934-7. Epub 2014 Jul 2.