

Assessing The Clinical Correlation Between Acute Appendicitis And Histopathological Diagnosis

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Abstract:

Background:

The most frequent reason for an acute abdomen that presents in the emergency room is acute appendicitis, which is primarily diagnosed based on clinical criteria. **Objective:** To evaluate the histological diagnosis and assess the diagnostic accuracy in a patient with acute appendicitis. **Methods:** At Northwest General Hospital and Research Center in Peshawar, Pakistan, this retrospective study was carried out between August 2021 and June 2022. The study comprised 104 patients who had an acute abdomen (an acute appendicitis diagnosis) at the time of presentation. Every successive patient had an appendectomy, and the intraoperative results, histopathological reports, and clinical diagnoses were compared. **Results:** The study comprised 104 patients in all who had appendectomies throughout this time. The age range of our patients was 16–53, and they arrived within 24 hours of the start of symptoms. The three most typical symptoms were anorexia, vomiting, and stomach pain. The predominant symptom was localized abdomen discomfort with a positive release sign. Gridiron was the most often made incision, followed by Lanz. There was gangrenous appendicitis in 12% of cases and acute appendiceal inflammation in 68%. There was a direct association between the time of presentation and the 3% perforation rate. Neither adenocarcinoma nor a carcinoid tumor affected any patients. Based on the histopathological findings, a negative appendectomy rate of 15.0% indicated that 85% of the cases had acute appendicitis. **Conclusion:** The diagnosis of acute appendicitis can be made with clinical surgical competence alone, but additional diagnostic tools can improve the diagnostic accuracy. These tools are not always available and are not always 100% accurate. Therefore, a histopathology report can verify a correct diagnosis, which depends on sound clinical judgement.

Keyword: Acute appendicitis, histopathology, clinical diagnosis.

Introduction:

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The most prevalent surgical illness that necessitates an emergency room admission and surgical intervention is still acute appendicitis. Even though acute appendicitis has been treated by surgeons since it was initially reported by R H Fitz (1) in 1886, nearly all surgeons still struggle with diagnosing it at some point throughout their careers. Because many non-appendiceal pathologies in the right iliac fossa can mimic appendicitis, surgeons prefer to either proceed with an immediate operation as soon as the diagnosis of acute appendicitis is made or to monitor the patient until the signs and symptoms make the diagnosis clearly evident. Superior clinical judgment has no other way to address the issues of misdiagnosis leading to consequences such as sepsis and perforation; and needless surgical treatments as well (2). Increased morbidity and mortality as well as complications like sepsis, peritonitis, or perforation could arise from a delayed diagnosis. (3, 4)

Acute appendicitis is primarily diagnosed clinically (5). Numerous clinical and laboratory-based scoring systems, as well as certain computer-assisted diagnostic tools, have been developed to date with the aim of enhancing clinical judgments. Although they can't always be used to diagnose cases, these additional diagnostic tools—which are never 100% accurate—definitely aided junior surgeons, whose diagnosis accuracy was reported to have increased from 58% to 71 % (6). Furthermore, even the most skilled surgeons may remove a normal appendix or "sit on" one that has perforated due to the diversity of signals and the presentation of the condition, which leaves them less than ideal throughout their career.

In order to assess the accuracy of clinical diagnoses given by surgeons in cases of acute appendicitis without heavily depending on auxiliary instruments and validated in light of histological data, this retrospective study was carried out.

Methods

The study included the clinical and pathological reports of 104 patients who visited the emergency department of Northwest General Hospital and Research Centre Peshawar Pakistan between August 2021 and June 2022, seeking consultation for an acute abdomen. These patients were admitted to the surgical department with a provisional diagnosis of acute appendicitis and underwent appendectomy.

The study excluded patients with peritonitis and those with an appendicular mass in the right iliac fossa. Every patient who was hospitalized had a thorough physical examination and a solid clinical history. A clinical history was taken, with particular attention paid to the type, character, and shifting of the right iliac fossa pain, fever, anorexia and vomiting. The past medical history of comparable pain episodes as well as last menstrual period in female individuals were also retrieved. Vital signs such as temperature, blood pressure, oxygen saturation and pulse were checked before a thorough abdominal examination was performed, with particular attention paid to the right lower quadrant, the location of maximal discomfort, rebound tenderness, and muscular guarding. Additionally, signs such as Psoas, Dumphy, Obturator, and Rovsing were assessed and methodically documented.

A few participants who needed more time under observation had regular reassessments, and the results were documented appropriately. Other than the diagnosis of acute appendicitis, no further diagnostic procedures were carried out unless specifically ordered by medicine/gastroenterology colleagues.

When there was a strong suspicion of acute appendicitis based on signs and symptoms, an appendectomy was recommended.

In all cases where there was uncertainty, an ultrasonography of the abdomen was conducted. Full blood count was performed for all patients for raised white cell count.

Following patient counseling, all patients who were ultimately clinically diagnosed with acute appendicitis were scheduled for either an open or laparoscopic appendectomy. As a general rule in cases of acute appendicitis, all patients were thoroughly informed in advance about the likelihood of a misdiagnosis leading to negative exploration and other differentials. All patients gave written informed consent, and the surgical team performed the appendectomy. The location, morphology, and perforation status of the appendix were noted as intraoperative observations. Every study participant had their appendix removed and sent for histological evaluation, even those with clinically normal-appearing appendices. The final diagnosis was determined by analyzing the histopathological examination report. The results were compared with the clinical presentation and intraoperative findings, and the data was analyzed.

Results:

One hundred and four subjects in total were investigated. Male patients were 82 (79%) and had a mean age of 25 ± 9.8 , while 22 (21%) were female and had a mean age of 29 ± 10.5 . Their ages ranged from 16 to 53 years (mean age of 27 ± 9.3). This study did not include any pediatric subjects.

After a thorough evaluation of the specimen during surgery, 12 % (12) had a normal appendix, whereas 83 % (87) had an appendix that seemed grossly inflamed at different stages, including acutely inflamed (68%), gangrenous (12%) and perforated (3%). Thus the rate of negative exploration (normal appendix) was only 12% as shown in table 1.

Table 1: Intra operative findings of patients having clinical diagnosis of acute appendicitis.

Per operative findings	N=Number of patients (percentages)
Normal	12 (12%)
Faecolith	5 (5%)
Inflamed appendix (In different stages)	
Inflamed	71 (68 %)
Gangrenous	13 (12 %)
Perforated	3 (3%)
Inflamed appendix in total	87 (83%)

Nevertheless, the specimen's histological analysis report, which is regarded as the last, conclusive diagnosis, shows that 85% of patients had appendicitis in various stages of inflammation, while 15% of patients had a normal appendix as shown in table 2 in details.

Table 2: Histopathological findings of patients having clinical diagnosis of acute appendicitis.

Histopathological findings	N=Number of patients (percentages)
Normal	16 (15%)
Inflamed appendix (In different stages)	
Inflamed	67 (64.5 %)

Gangrenous	17 (16.5 %)
Perforated	4 (4%)
Inflamed appendix in total	88 (85%)

Since acute appendicitis was initially diagnosed in all of the study individuals, the overall percentage of male subjects with negative appendectomies was 7.7%, compared to a rather high 25% of female subjects. As a result, compared to female respondents, the diagnostic accuracy for male subjects appears to be significantly higher.

Discussion:

The most frequent reason for an acute abdomen necessitating emergency surgery is still acute appendicitis. Our clinical diagnostic accuracy rate was 85%, based on the investigation of 104 participants who were clinically diagnosed with acute appendicitis and 85% of whom had their diagnosis confirmed histopathologically. This study's determined negative exploration rate of 15% is consistent with other research indicating ranges of 15–30 % (7). The accuracy of the diagnosis of acute appendicitis varies depending on the patient demographic and surgeon experience because it was determined only on clinical grounds. We assessed the final result, diagnostic hints, and clinical presentation in the context of the histopathological findings of appendix specimens.

Additionally, research has demonstrated that although adult females are less likely to get acute appendicitis, diagnosing the condition will be most difficult when they are childbearing, particularly in the middle of the menstrual cycle(8). The rate of negative exploration is especially high because there are several other potential clinical conditions that can resemble female acute appendicitis. Therefore, when compared to their counterpart, all these factors finally result in a higher diagnostic accuracy in male subjects.

According to Borgstein et al. (9), laparoscopy decreased the negative appendectomy rate in female patients who were fertile from 38.0% to 5.0% and in postmenopausal women and men from 8.0% to 4.0%.

Only when the patient's symptoms are determined to be caused by an inflamed appendix during surgery can the surgeon be considered completely pleased. If not, it would be necessary to investigate other intra-abdominal pathologies, which would raise the rate of morbidity and death needlessly. Consequently, a statistically significant ($p=0.0013$) correlation was observed between the intraoperative diagnosis of acute appendicitis and the histopathological findings. In comparison to previous studies by Tiwari A et al. (10) and Shum CH (11), where it was 76% and 85% respectively, the accuracy of intra-operative diagnosis in this study is 85%. According to Colson et al. (12), there was a higher perforation rate when symptoms were present more than 12 hours later, but there was no difference in the perforation rate when symptoms were delayed while the patient was in the hospital. The early presentation within 24 hours was the reason for the relatively low perforation rate in our study.

The retrospective nature of this study is its limitation. Also the different age groups were not taken into account and generalized age range was used for different stages of the inflamed appendix.

Conclusion:

Acute appendicitis is primarily diagnosed clinically, and on the basis of clinical symptoms and signs, a confident diagnosis should be made with a complete physical examination and appropriate history. Even though there are a number of other laboratory tests and radiographic diagnostic techniques available to help with the diagnosis, none of them appear to be precise

enough and may not always be available. A satisfying result by international standards can be obtained if the diagnosis is based on a good clinical history and a comprehensive physical examination, with repeat if necessary. The clinical expertise of a skilled surgeon cannot be replaced by any diagnostic laboratory test now available, therefore histological findings in our situation support the need for routine appendix histopathological investigation.

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