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Original Research Article

Spectrum of Clinical Presentations in Different Variants of Acute Appendicitis

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ABSTRACT

Acute appendicitis is the commonest abdominal emergency. It is mainly a disease of teenagers and young adults affecting the most productive section of the population. So prolongation of morbidity due to negative laparotomy is unwanted and at the same time delay in diagnosis of acute appendicitis is apprehended. The present study was conducted on 75 histologically proved cases of acute appendicitis. Detailed clinical, morphological and histopathological features were studied. Abdominal pain was present in all patients and right iliac fossa was the usual site of abdominal pain. A significant number of cases reported a migration of pain to right iliac fossa from periumbilical region. Nausea and vomiting were other common symptoms. Tachycardia and pyrexia were more prominent in advanced appendicitis cases. Other important clinical features were related with types of appendicitis. Routine histopathology is vital for surgeons to assess their clinical diagnosis, which in the long run will consolidate the base of their clinical experience and enrich the understanding of the pathologies of the appendix as a whole and improve their clinical judgment.

Key Words: Acute Appendicitis, Physical examination, Diagnosis, Clinics

INTRODUCTION

Throughout the history of medical science, vermiform appendix has been a point of interest and dilemma. In Spite of the organ being considered vestigial functionally its importance lies in the fact that its pathological affection is one of the commonest causes of acute abdomen and young individuals are the most potential sufferers. [1] Acute appendicitis and recurrent acute appendicitis is the usual pathology. Closed loop obstruction of the appendiceal lumen is believed to be a major cause of appendicitis. [2] It contributes to bacterial overgrowth. Continued secretion of mucus leads to intraluminal distension and increased wall pressure. Subsequent impairment of lymphatic and venous drainage leads to ischaemia. The inflammatory reaction transforms the normal glistening serosa into a dull, granular, red membrane; this transformation signifies early acute appendicitis. [3]

Microscopical changes range from minimal focal inflammation to total necrosis of the appendiceal wall. In early cases, the appendix may appear normal externally or may merely show hyperemia. Catarrhal appendicitis is the stage of initial mucosal and submucosal inflammation. At a later stage a prominent neutrophilic exudate generates a fibrino-purulent reaction over the serosa known as phlegmonous appendicitis. As the inflammatory process worsens, there is abscess formation, hemorrhagic ulcerations and gangrenous

necrosis within the wall extending to the serosa, creating acute gangrenous appendicitis. [4] There is development of focal defects in the appendiceal wall with subsequent perforation, resulting in periappendiceal abscess and suppurative peritonitis. Subsequently omentum or small-bowel loops adhere to it, forming a palpable appendicular lump. [5]

Abdominal pain is the main symptom with which a patient presents. [6] The site, duration and degree of pain vary. First site of pain usually is periumbilical; it is steady and moderately severe with intermittent cramping. Migration of the pain is seen and the pain localizes to the right lower quadrant. [7] Nausea and vomiting is the second commonest symptom, though such symptoms are neither prominent nor prolonged. [8] Fever and tachycardia are useful indicator of severity and prognosis of the disease, as are more common in perforated cases. [9]

Tenderness at right iliac fossa is most common and important sign from diagnostic point of view. [10] The Mc Burney's Point corresponds most commonly to the point of maximum tenderness. [11] Rebound tenderness is after slow graded pressure on the right iliac fossa when the hand is suddenly withdrawn the patient winces in pain. Rovsing's sign is pressure on left iliac fossa causes pain in right iliac fossa. Cope's psoas test is due to appendicitis causes inflammation of the right psoas major muscle thereby causing pain on hyperextension of the right hip joint. Cope's obturator test is pain on medial rotation of flexed thigh due to irritation of the obturator internus muscle. Dunphy's Sign is coughing may cause increased pain. Diffuse peritonitis may be associated with generalized abdominal rigidity. [12]

Early diagnosis appendicitis followed by prompt intervention can significantly reduce the mortality and morbidity. [13] So, early diagnosis has been the greatest challenge and even after several investigational modalities that modern science has armed us with; the diagnosis is based mainly on clinical symptoms and signs. Though radiological investigations have evidently supported clinical diagnosis, they are neither absolutely necessary nor feasible especially in a poor country like ours. [14, 15] The present work was intended to study the clinical signs and symptoms of acute appendicitis with reference to histopathological changes.

MATERIALS AND METHODS

This prospective study was conducted for a period of 1 year on 75 histologically proved cases of acute appendicitis. The cases were consecutive and unselected. These patients presented with acute pain in the right lower quadrant of the abdomen. Most of them had fever, nausea and vomiting as associated symptoms. The history and clinical findings were noted. Subsequently these cases were clinically diagnosed as acute appendicitis. Obesity often obscures the typical signs and symptoms of acute appendicitis, hence these cases were excluded. [16] Specimens for macroscopic and histopathological study were collected from them while undergoing appendectomy. The diagnostic histological criterion of early acute appendicitis is controversial and has not been precisely defined. [17] As drainage of an exudate into the appendix from a focus of infection in a higher level of bowel or inflammation of any other periappendiceal structure may induce some neutrophilic infiltration in the mucosa, evidence of inflammation within the muscularis was considered criteria for diagnosis. Symptoms and clinical signs elicited in these patients were studied in comparison to the type of appendicitis.

RESULTS

The macroscopic appearances of the appendices were noted. Amongst the 75 histologically proved acute appendicitis cases the morphological appearance of vermiform appendix was most commonly phlegmonous (48%). Catarrhal type (22%) was the second commonest type. Gangrene and perforation was noted in 12% and

9.33% cases respectively. 2 cases presented with appendicular lump on laparotomy though no lump was palpable per abdomen. In 4 cases the appendices appeared normal morphologically though on histology had neutrophilic infiltration of muscularis propria.

Duration of abdominal pain is an important aspect which was considered and studied according to the morphological types. The duration of abdominal pain in right lower quadrant in histological proved acute appendicitis cases are shown in Table no. 1.

Table no. 1: Duration of pain in right iliac fossa in cases of acute appendicitis

Duration	**Normal looking**	**Acute catarrhal**	**Acute phlegmonous**	**Acute gangrenous**	**Acute Perforated**	**Lump**	**Total (75)**
< 12 hrs	02	03	01	00	00	00	6 (8%)
12 to 24 hrs	02	10	14	01	00	00	27 (36%)
24 to 48 hrs	00	04	17	05	02	00	28 (37.33%)
48 to 72 hrs	00	00	03	02	04	00	9 (12%)
72 hrs to 1 week	00	00	01	01	01	01	4 (5.33%)
> 1 week	00	00	00	00	00	01	1 (1.33%)
Total	04	17	36	09	07	02	75 (100%)

The commonest symptom noted in cases of acute appendicitis was localized pain in right iliac fossa (90.67%) followed by nausea (76%), at the time of presentation. 100% patients suffered from abdominal pain. (Table no. 2)

Table no. 2: Symptoms of acute appendicitis patients at presentation

Symptoms		Normal looking	Acute catarrhal	Acute phlegmonous	Acute gangrenous	Acute Perforated	Lump	Total (%)
Abdominal pain	Total	4	17	36	9	7	2	75 (100)
	Pain in right iliac fossa	3	15	34	9	5	2	68 (90.67)
	Periumbilical pain	1	2	2	0	0	0	5 (6.67)
	Generalized pain in the abdomen	0	0	0	0	2	0	2 (2.67)
Migration of pain from periumbilical region to right iliac fossa		2	11	19	5	4	1	42 (56)
Nausea		2	10	28	8	7	2	57 (76)
Vomiting		1	6	12	5	4	1	29 (38.67)
Fever		1	4	8	5	4	1	23 (30.67)
Loss of appetite		3	12	27	6	5	1	54 (72)
Constipation		1	3	4	1	2	1	12 (16)
Diarrhoea		0	2	3	3	2	0	10 (13.33)
Headache		1	4	5	2	2	0	14 (18.67)
Dysuria		0	0	0	1	0	0	01 (1.33)

Pulse rate of more than 100/min were recorded among patients with advanced appendicitis (gangrenous and perforated). Mean temperature of more than 100°F was noted in gangrenous and perforated cases. (Table no. 3)

Table no. 3: Clinical signs in cases of acute appendicitis

SIGNS	Normal looking	Acute catarrhal	Acute phlegmonous	Acute gangrenous	Acute Perforated	Lump	Total 75 (%)
Pulse Mean)	86/min	90/min	88/min	105/min	116/min	84/min	--
Temperature (Mean)	98.6°F	99.4°F	99.8°F	100.6°F	101.5°F	99.5°F	--
Mc Burney's point tenderness	4	17	36	9	7	2	75 (100)
Rebound Tenderness	1	9	20	8	7	0	45 (61.33)
Rovsing's sign	2	8	12	7	6	0	35 (46.67)
Cope's Psoas Test	0	6	9	3	2	0	20 (26.67)
Cope's Obturator Test	0	2	4	2	1	0	9 (12)
Cough Test	1	7	14	7	7	0	36 (48)
Generalized abdominal rigidity	0	0	0	2	6	0	8 (10.67)

DISCUSSION

Generally acute appendicitis presents with the clinical presentation of pain around umbilicus, subsequently shifting to right iliac fossa accompanied by vomiting and by tachycardia, but its

presentation can be varied. Such clinical dilemma may cause delay in diagnosis resulting in complications like gangrene, appendicular abscess, perforation and peritonitis which significantly increase mortality, morbidity and cost of treatment. Overenthusiastic laparotomies again are undeserving because it's a burden on the patient's health and purse. [18]

Microscopical changes in acute appendicitis range from minimal focal inflammation to total necrosis of the appendiceal wall. The degree of abnormalities depends on the interval between onset of symptoms and operation. [19] The clinical diagnostic accuracy of acute appendicitis which can be confirmed by histopathological study is a very important aspect of medical science and it has been seen to vary greatly from institution to institution and also at different times in the same institution as it is dependant much on the expertise and experience of the clinician. In an age accustomed to early and accurate preoperative diagnosis acute appendicitis remains an enigmatic challenge and a reminder of the art of surgical diagnosis. [20]

In this study gangrenous and perforated cases were considered as advanced appendicitis and 21.33% cases had advanced acute appendicitis. At the time of presentation abdominal pain was seen in 100% of the patients. In 68 (90.67%) patients the site of pain was the right iliac fossa, in 5 patients the site was periumbilical, whereas generalized pain was seen is 2 patients. Both the cases presenting with generalized abdominal pain had perforated appendicitis. 42 (56%) patients had a periumbilical pain at the time of onset which then migrated to right iliac fossa. Nausea with or without vomiting was the second commonest symptom, seen in as many as 76% cases. Nearly half of these patients (38.67%) had vomiting accompanying nausea. These results though not entirely but closely resembled the result of Pieper et al. [21] In another study conducted in Nigeria previously the incidence of nausea and vomiting was significantly lower than the present study. [22]

Mc Burney's point tenderness was the universally positive sign in cases of acute appendicitis. Average of pulse rates of patients who were having advanced appendicitis was more than 100/min, other patients of acute appendicitis had a lower average. Average temperature recorded in gangrenous and perforated cases were 100.6° F and 101.5° F respectively. Other milder forms of the disease caused no to moderate degree to rise in temperature. Rebound tenderness was elicited in 61.33% of cases which was significantly higher than results of Pieper et al. [21] Rovsing's sign was elicited in 46.67% patients of acute appendicitis, closely corroborating with previous study in Nigeria. [22] Cope's Psoas test was positive in. 26.67% cases which was higher than previous studies.

As gangrenous changes and particularly perforations are always dreaded by clinicians and surgeons so prediction of advanced disease from severity and duration of symptoms and signs has been a matter of interest. Abdominal pain has consistently been the commonest symptom, so duration of abdominal pain has commonly been used as a predictor along with other more important features like pulse rate, temperature and signs of peritonitis like generalized abdominal rigidity and rebound tenderness. Gangrenous varieties usually had a history of 1 to 2 days of pain abdomen whereas cases of perforations usually presented on the 3rd day. Only 8% cases presented within 12 hours of onset of pain and their appendices commonly appeared catarrhal or normal looking. The duration of pain of 17 cases of histologically normal appendices was noted and seen to be between 3 to 7 days in 6 out of 17 cases and in 2 cases the duration of pain was more than 1 week. So the average duration of pain in negative appendicectomies was definitely more than in cases of acute appendicitis proved histologically. The proximity of the appendix to the right ureter may give rise to urinary symptoms. [23]

The approach to acute appendicitis is influenced by the desire to reduce the misdiagnosis rate to avoid unnecessary surgery on one hand and by attempt to operate at an early stage of the disease in order to reduce associated morbidity on the other. In our present study we have got a negative appendicectomy rate of 17.71% which was considerably high but within acceptable range. Whereas the perforation rate was as low as 9.33% and advanced appendicitis was seen in 21.33% cases. This explains the inclination of surgeons to reduce mortality and morbidity associated with advanced disease even at the expense of a considerable negative appendicectomy rate.

Use of laboratory investigations, imaging modalities in cases with obscure and non-specific symptoms of longer duration and especially in females of reproductive age-group can considerably reduce the negative appendicectomy rate. Similarly, misdiagnosis is very common in children as they also present frequently with nonspecific symptoms. Leukocyte count and USG can be very useful to rule out appendicitis in such ambiguous cases.

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