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Prospective Study of Evaluation of Risk Factors for Pelvic Abscess in Case of Acute Appendicitis in a Tertiary Care Centre Victoria Hospital

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ABSTRACT
Acute appendicitis and its complications are leading causes of acute abdomen and indications for emergency surgical intervention in clinical practice. In clinical terms, acute appendicitis can be described as simple or complicated. Complicated appendicitis includes appendix mass, appendix abscess and perforated appendicitis. This study aims to evaluate the risk factors contributing to the development of pelvic abscess in patients diagnosed with acute appendicitis at Victoria Hospital. A prospective observational study was conducted over six months, involving patients diagnosed with acute appendicitis. Data were collected on demographic information, clinical presentation, laboratory findings and imaging results. Factors such as age, gender, duration of symptoms and preoperative management were analyzed. Pelvic abscess formation was confirmed via ultrasound or CT imaging. In without RIF/pelvic collection on CT Group, 23 (53.5%) patients had Migration/relocation of pain. In with RIF/pelvic collection on CT Group, 21 (77.8%) patients had Migration/relocation of pain. Association of Migration/relocation of pain with RIF/pelvic collection on CT Group was statistically significant ($p = 0.0406$). The study highlights key risk factors associated with pelvic abscess in acute appendicitis, emphasizing the importance of timely diagnosis and intervention. Recognizing these factors may help clinicians in managing patients effectively and reducing the incidence of complications.

INTRODUCTION

Acute appendicitis and its complications are leading causes of acute abdomen and indications for emergency surgical intervention in clinical practice. In clinical terms, acute appendicitis can be described as simple or complicated. Complicated appendicitis includes appendix mass, appendix abscess and perforated appendicitis. Most complicated appendicitis started de novo as simple appendicitis raising the notion that it is a disease in evolution that has become of clinical importance due to delayed or missed diagnosis. Grossly, simple appendicitis is of two major forms: obstructive and catarrhal appendicitis. Acute appendicitis in adults is often obstructive in type and sequel to some form of luminal obstruction by fecaliths, lymphoid tissues, or rarely foreign bodies[1]. Extrinsic causes of luminal obstruction of the appendix include periappendiceal bands. Anatomically, appendix is a blind-ending structure. A closed-loop obstruction of its lumen in severe cases result in inflammation and transmural necrosis which eventually lead to perforation and discharge of the luminal contents (pus and fecaliths) and peritonitis. A prospective study by Narsule *et al*.[2] on 202 children undergoing appendicectomy revealed a linear relationship between the duration of symptoms (onset to surgery) and risk of perforation. In their study, no perforation was recorded in children with abdominal pain of <12 hrs duration. The perforation rate rose in a linear fashion from 10% by 18 hrs to 44% by 36 hrs. If symptoms were present for more than 2 days, the risk of perforation was >40%. In contrary, Bickell *et al*.[3] in an earlier retrospective study of 219 adults with appendicitis had documented a minimal perforation risk in the first 36 h of symptom onset and remains at 5% thereafter. However, a study has shown that in many patients treated with antibiotics, appendicitis symptoms may resolve without ensuing perforation; hence, medical treatment with antibiotics has been proposed in a selected group of patients with uncomplicated appendicitis[4].

Sequelae of appendiceal perforation have some important economic consequences and are associated with increased length of hospital stay, morbidity and mortality even with treatment[5]. These factors are important considerations in developing countries where access to health care and resources are limited with attendant delay in diagnosis and treatment.

RESULTS AND DISCUSSION

Omari *et al*.[6] showed that acute appendicitis is the most common surgical emergency and becomes serious when it perforates. Perforation is more frequent in the elderly patients. The aim of this study was to identify the risk factors of perforation in elderly patients who presented with acute appendicitis. The medical records of 214 patients over the age of 60 years who had a pathologically confirmed diagnosis of acute appendicitis over a period of 10 years (2003-2013) were retrospectively reviewed (Table 1).

Table 1: Association between Nausea and Vomiting, anorexia, extra luminal air on CT: RIF/Pelvic collection on CT Group

	RIF/pelvic collection on CT group			
	No	Yes	Total	p-value
Nausea/vomiting				
No	17.0	18.0	35.0	
Row (%)	63.0	37.0	100.0	
Col (%)	39.5	37.0	38.6	0.0271
Yes	26.0	9.0	35.0	
Row (%)	60.5	39.5	100.0	
Col (%)	60.5	63.0	61.4	
Total	43.0	27.0	70.0	
Row (%)	61.4	38.6	100.0	
Col (%)	100.0	100.0	100.0	
Anorexia				
No	25.0	9.0	34.0	
Row (%)	73.5	26.5	100.0	
Col (%)	58.1	33.3	48.6	0.04324
Yes	18.0	18.0	36.0	
Row (%)	50.0	50.0	100.0	
Col (%)	41.9	66.7	51.4	
Total	43.0	27.0	70.0	
Row (%)	61.4	38.6	100.0	
Col (%)	100.0	100.0	100.0	
Extra luminal air on CT				
No	33.0	13.0	46.0	
Row (%)	71.7	28.3	100.0	
Col (%)	76.7	48.1	65.7	0.0141
Yes	10.0	14.0	24.0	
Row (%)	41.7	58.3	100.0	
Col (%)	23.3	51.9	34.3	
Total	43.0	27.0	70.0	
Row (%)	61.4	38.6	100.0	
Col (%)	100.0	100.0	100.0	

Table 2: Association between Presence of appendicolith, presence of SSI: RIF/pelvic collection on CT group

	RIF/pelvic collection on CT group			
	No	Yes	Total	p-value
Presence of appendicolith				
No	33.0	14.0	47.0	
Row (%)	70.2	29.8	100.0	
Col (%)	76.7	51.9	67.1	0.0309
Yes	10.0	13.0	23.0	
Row (%)	43.5	56.5	100.0	
Col (%)	23.3	48.1	32.9	
Total	43.0	27.0	70.0	
Row (%)	61.4	38.6	100.0	
Col (%)	100.0	100.0	100.0	
Presence of SSI				
No	37.0	20.0	57.0	
Row (%)	64.9	35.1	100.0	
Col (%)	86.0	74.1	81.4	0.2099
Yes	6.0	7.0	13.0	
Row (%)	46.2	53.8	100.0	
Col (%)	14.0	25.9	18.6	
Total	43.0	27.0	70.0	
Row (%)	61.4	38.6	100.0	
Col (%)	100.0	100.0	100.0	

In our study, out of 70 patients most of the patients were 31-40 years old [23 (32.9%)] but this was statistically significant (p<0.0001) (Table 2).

Omari *et al*.[6] showed that acute appendicitis is the most common surgical emergency and becomes serious when it perforates. Perforation is more frequent in the elderly patients. The aim of this study was to identify the risk factors of perforation in elderly

patients who presented with acute appendicitis. During the study period, a total of 214 patients over the age of 60 years had acute appendicitis, 103 males and 111 females. Appendix was found perforated in 87 (41%) patients, 46 (53%) males and 41 (47%) females.

Khan *et al*.[7] showed that acute appendicitis is a common and well-recognized condition that can be easily managed. However, at times it can become significantly complicated and thus life-threatening. Acute appendicitis can present atypically with findings such as peritonitis and even abdominal abscesses. During laparotomy it is highly unusual to find signs of peritonitis that were not initially visualized by abdominal imaging studies consisting of retroperitoneal and pelvic abscesses. In this case report, they describe the diagnosis and management of a 62-year-old female discovered to have several retroperitoneal abdominal and pelvic abscesses complicated by peritonitis discovered during exploratory laparotomy at the time of appendectomy. Hindosh *et al*.[8] observed that appendectomy is still one of the most commonly performed emergency surgical procedures worldwide. Avoiding delays in the diagnosis in these patients may play a role in reducing observed morbidity.

The male are slightly more affected than female in a percentage of (60 male) 55.55% and (48 female) 44.44%.

We found that, male population was higher [41 (58.6%)] than the female population [29 (41.4%)] but this was not statistically significant (p = 0.8755).

Our study showed that, less number of patients had Migration/relocation of pain in without RIF/pelvic collection on CT Group [23 (53.5%)] compared to with RIF/pelvic collection on CT Group [21 (77.8%)] but this was statistically significant (p = 0.0406).

Our study showed that, more number of patients had smoker in with RIF/pelvic collection on CT Group [9 (63.0%)] compared to without RIF/pelvic collection on CT Group [26 (60.5%)] but this statistically significant (p = 0.0271).

Naderan *et al*.[9] found that to investigate the patient's history and physical examination information to find out risk factors associated with complicated appendicitis. Based on multivariate analysis, risk factors for complicated appendicitis included presenting with epigastric pain (OR = 3.44), diarrhea (OR = 23.4) or malaise (OR = 49.7), history of RLQ pain within the past 6 months (OR = 4.93), older age (OR = 1.04), being married (OR = 2.52), lack of anorexia (OR = 4.63) and longer interval between onset of symptoms and admission (OR = 1.46).

We observed that, higher number of patients had anorexia in with RIF/pelvic collection on CT Group [18 (66.7%)] compared to without RIF/pelvic collection on CT Group [18 (41.9%)] but this was statistically significant (p = 0.04324).

Stringer *et al*.[10] showed that acute appendicitis is the most common reason for abdominal surgery in children. Luminal obstruction of the appendix progresses to suppurative inflammation and perforation, which causes generalised peritonitis or an appendix mass/abscess. Classical features include periumbilical pain that migrates to the right iliac fossa, anorexia, fever and tenderness and guarding in the right iliac fossa.

Sellars and Boorman[11] found that they aimed to assess the value of early laparoscopic therapy in management of tubo-ovarian abscess (TOA) or pelvic abscess. Early laparoscopic treatment is associated with shorter time of fever resolution, shorter hospitalization and less blood loss compared with conventional treatment for TOA or pelvic abscess.

It was found that, lower number of patients had fever without RIF/pelvic collection on CT Group [27 (62.8%)] compared to with RIF/pelvic collection on CT Group [21 (77.8%)] but this not statistically significant (p = 0.1885).

We examined that, more number of [43 (100.0%)] patients had pain in RIF/RLQ in without RIF/pelvic collection on CT Group compared to with RIF/pelvic collection on CT Group [27 (100.0%)].

We showed that, higher number of [17 (74.1%)] patients had rebound tenderness in with RIF/pelvic collection on CT Group compared to without RIF/pelvic collection on CT Group [28(65.1%)] but this was statistically significant (p = 0.0481).

In our study, higher number of [23 (85.2%)] patients had guarding in with RIF/pelvic collection on CT Group compared to without RIF/pelvic collection on CT Group [25 (58.1%)] but this statistically significant (p = 0.0176) (Fig. 1).

We found that, most number of [14 (51.9%)] patients had extra luminal air on CT in with RIF/pelvic collection on CT Group compared to without RIF/pelvic collection on CT Group [10 (23.3%)] but this was statistically significant (p = 0.0141).

Moris *et al*.[12] found that acute appendicitis is the most common abdominal surgical emergency in the world, with an annual incidence of 96.5 to 100 cases per 100 000 adults. Specific imaging findings on computed tomography (CT), such as appendiceal dilatation (appendiceal diameter $\geq$7 mm), or presence of appendicoliths, defined as the conglomeration of feces in the appendiceal lumen, identify patients for whom an antibiotics-first management strategy is more likely to fail.

We observed that, more number of [13 (48.1%)] patients had presence of appendicolith in with RIF/pelvic collection on CT Group compared to without RIF/pelvic collection on CT Group [10 (23.3%)] but this was statistically significant (p = 0.0309).

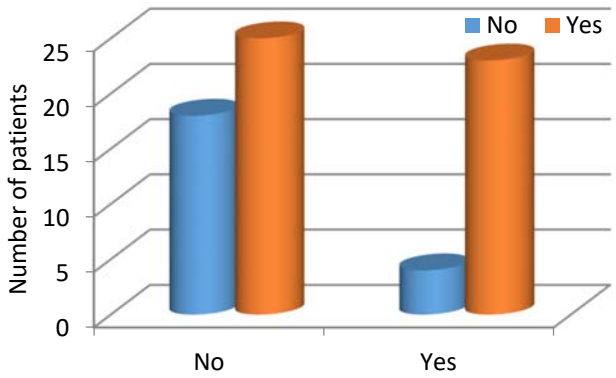

Fig. 1: Guarding

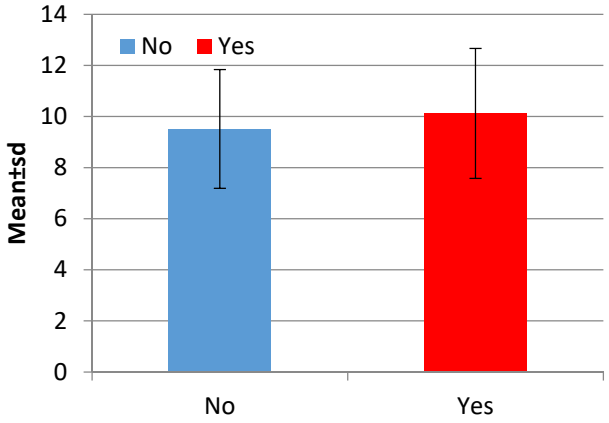

Fig. 2: USG findings (mm)

It was found that, lower number of [7 (25.9%)] patient had presence of SSI in with RIF/pelvic collection on CT Group compared to without RIF/pelvic collection on CT Group [6 (14.0%)] but this was not statistically significant (p = 0.2099).

Omari *et al*.[6] showed that acute appendicitis is the most common surgical emergency and becomes serious when it perforates. Perforation is more frequent in the elderly patients. The aim of this study was to identify the risk factors of perforation in elderly patients who presented with acute appendicitis. The medical records of 214 patients over the age of 60 years who had a pathologically confirmed diagnosis of acute appendicitis over a period of 10 years (2003-2013) were retrospectively reviewed.

In our study, mean Age was higher in with RIF/pelvic collection on CT GROUP [50.9259±9.3188] compared to without RIF/pelvic collection on CT GROUP [27.3023±6.1200] but this was statistically significant (p<0.0001).

We found that, mean duration Of Symptoms >48 hrs was less in without RIF/pelvic collection on CT GROUP [2.9535±2.1152] compared to with RIF/pelvic collection on CT GROUP [2.9630±1.1260] but this was not statistically significant (p = 0.9830).

Our study showed that, mean Total Count was more in with RIF/pelvic collection on CT GROUP [12736.8148±4776.0536] compared to without RIF/pelvic collection on CT GROUP [11754.3721±13601.8699] but this was not statistically significant (p = 0.7194).

We observed that, mean USG findings (mm) was lower in without RIF/pelvic collection on CT GROUP [9.512±2.3256] compared to with RIF/pelvic collection on CT GROUP [10.1214±2.5412] but this was statistically significant (p = 0.0341) (Fig. 2).

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