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Perforation in Acute Appendicitis among Patients of Tertiary Care Hospital Chennai.

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Introduction

Vermiform appendix is considered a vestigial organ. Acute appendicitis is inflammation and infection of appendix. Acute appendicitis has a lifetime prevalence of about 7 percent. Appendicectomy is the most frequently performed emergency abdominal operation.

The clinical presentation is often atypical and hence diagnosis is difficult in both adult and pediatric patient. Despite all improvements in clinical and laboratory diagnosis and the publication of various scoring systems to guide clinical decision-making, the fundamental decision whether to operate or not remains challenging. We would like to optimally diagnose and treat all patients with suspected acute appendicitis without unnecessary appendectomies. As perforation is associated with higher morbidity and mortality, negative Appendisectomy have to be accepted but still it also increase exposure to surgical risk. Accurate diagnosis has to be made with history, physical examination, lab workout, imaging studies.

Perforation of appendix

If inflammation and infection continue rupture or perforation of appendix occurs. Time interval between onset of symptoms and rupture is about 36 to 72 hours. In acute appendicitis, at least 20 to 30 %of patients have atypical symptoms, signs or lab findings. Patient related factors constitute main reason for delays. It is unclear whether risk of perforation is mainly related to duration of inflammation or it is because of patient related factors. Acute appendicitis is more aggressive disease in elderly, presenting more rapid progression to perforation.

Appendicitis perforation increase risk of complications up to 30% and if there is no perforation during operation rate is about 8%. In patients with perforated Appendix duration of post-op hospitalization is significantly higher. Appendix perforation mostly depends on pre admission duration. Comparing CT and clinical examination for diagnosis of acute appendicitis, CT did not increase accuracy of diagnosis. Perforation increase with age and increased in males. Delay of admission is the main predictive factor for appendix complication. In our study, we have analyzed rates of perforation in acute appendicitis, age group and sex most commonly affected, most common presentation, surgical and radiological findings.

Aims and Objectives

Study done to find the rates of perforation in appendicitis and the age group commonly affected and the most common presentation (radiological and intraoperative)

Materials and Methodology

Cross sectional study of 8month duration with 200 sample size.

Review of Literature

Acute Appendicitis

Macroscopic

- Grossly swollen and reddened appendix
- Surface is covered with fibrin and flakes
- Liquid faeces along with fecal concretions mixed with pus and blood may be seen in lumen.

Microscopic

- Densely infiltration of neutrophilic granulocytes is seen in all the layer s of the organ.

Perforated Appendix

Macroscopic

- Appendix is swollen and discolored
- Widening seen at the concretions site and distal to it,
- Perforation is seen as small opening and edges are ragged .it is surrounded by friable zone which is dirty brown colour.

Risk of Perforation

- Extremes of age are commonly affected.
- Due to increased chance of infection, diabetics and immunosuppressed individuals are at risk
- In individuals with previous history of abdominal surgery due to undeveloped Omentum also surgeries involving resection of Omentum.
- Obstruction by fecolith
- Pelvic appendix is prone due to increased intraluminal pressure.

Gangrenous Appendix

Macroscopic

- grossly discoloration .can be red, brown or black color
- It is friable containing faeces or pus.

Clinical features

The typical sequence of central colicky pain in the abdomen which is followed by vomiting and then pain migrating to the right iliac fossa is seen. It was described first by Murphy. Seen only in 50% of patients.

Symptoms [5]

Pain

Abdominal pain is the primary presenting complaint in majority of patients typically, the patient develops a peri-umbilical colicky pain. This pain increase in the first 24 hours. Then it becomes sharp and patient has constant pain. Later it migrates to the right iliac fossa. The initial pain is referred pain due to visceral innervation of the midgut. The localised pain is due to involvement of the parietal peritoneum after progression of the inflammatory process.

Signs [3]

Rovsing's sign: On palpation of left lower quadrant of abdomen, Guarding and rebound tenderness of the right lower quadrant is seen.

Psoas sign: On extension of the right hip, patient develops pain

Obdurate sign: On internal rotation of the right hip, patient develops pain.

- Rigidity of abdomen along with high fever indicates chances of perforation.
- Possible signs of an atypical presentation
  - Generalised pain in abdomen of long duration
  - Pain over right flank
  - Pain over right upper quadrant
  - Nonlocalised abdominal pain
- In the elderly and in infants, clinical signs are mild.

Observation and Results

Baseline characteristics of the study participants

The present study included a total of 200 study participants. The study participants were those who presented with acute appendicitis and undergoing Appendisectomy. Among total 200 participants,

122(61%) were males and 78(39%) were females. Among the study participants, 31(15.5%) were belonging to overweight and 93 (46.5%) obese category as per Asian Indian classification of BMI.

Age

Among total 200 participants, the age of the study participants ranged from 17-75 years with mean (±SD) age was 25.9 (±12.5) years. The median age of study participants was 22 years.

Pre Hospital Symptom Duration

Majority of patients (49.5%) presented within two days after onset of symptoms, 47.5% presented 2 to 5 days of onset of symptoms.3% presented after 5 days of onset of symptoms

Imaging

From image finding, the character of appendix was peristaltic with 6-8 mm size (39%), 9-11 mm size (24%) and Hypoechoic periappendiceal collection in 6.5% and appendix could not be 5isualized in 30.5%

Intraoperative Finding Perforation

Perforation was found in 23(11.5%) of study participants. Thus the perforation rate was 11.5%. Position of appendix varied – retrocaecal was majority (79.5%), followed by subcaecal (8.5%), pelvic (6.5%), post ileal (2.5%) and para Ceacal, sub hepatic and pre ileal (1%). During operation mass was found in 7(3.5%) of study participants.

Table 1 Distribution of study participants according to site of perforation (N =200).

S.No.	Site of perforation	N(%)
1.	**Site of perforation**	
	Base	3(1.5)
	Body	2(1)
	Tip	18(9)
	No perforation	177(88.5)

Table 2 Association between selected variables and incidence of perforation.(N=200)

S. No.	Variables	perforation rate		*p* value
		Yes N(%)	No N(%)	
1.	**Gender**			
	Male	19(15.6)	103(84.4)	0.189
	Female	4(5.1)	74(94.9)	
2.	**Age group**			**0.000**
	17-45	15(8.1)	167(91.8)	
	45-60	5(33.3)	10(66.7)	
	>60	3(100)	0	
3.	**Position of appendix**			0.930
	Paracoecal	1(50)	1(50)	
	Retrocoecal	16(1.1)	143(89.9)	
	Sub coecal	3(17.6)	14(82.4)	
	Preileal	0	2(100)	
	Postileal	0	5(100)	
	Subhepatic	0	2(100)	
	Pelvic	3(23.1)	10(76.9)	
4	Pre hospital symptoms duration			0.000
	1-2 days	0(0)	99(100)	
	3-5 days	20(21.1)	75(78.9)	
	>5 days	3(50)	3(50)	

Chi square test applied, p value <0.05 is significant Chi square test was applied to check if any association was found between perforation and sex, age group and position of appendix. It was found that age group up to 45 years was associated with higher perforation than its counter parts. This was found to be statistically significant. (p value =0.000) . The proportion of perforation among those who presented late (after 5 days) was much higher than those who presented with symptoms earlier. This was

Statistically significant (p value =0.000). However no association was found with gender and position of appendix. (Table 2).

Conclusion

Acute appendicitis is the most common surgical emergency. It is crucial to avoid two potential situations in patients with suspected acute appendicitis- any delay in diagnosis with subsequent perforation of the appendix and an unnecessary Appendisectomy. Clinical diagnosis along with lab and imaging modalities help in tactful management of patient and complications can be avoided. Development of complications not only depends on time of presentation to hospital, but also on patient characteristics. Any age

group and both sex are at risk. High index of suspicion needed especially in atypical presentation and extremes of age group and patients to be managed efficiently.

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