

**CLINICAL STUDY OF APPENDICULAR PERFORATION IN A TERTIARY CARE HOSPITAL**Venkata Anantha Lakshmi Manabala<sup>1</sup>, Krishna Mohan Narayanrao<sup>2</sup><sup>1</sup>Assistant Professor, Department of General Surgery, Gandhi Medical College, Secunderabad, Telangana State.<sup>2</sup>Professor, Department of General Surgery, Gandhi Medical College, Secunderabad, Telangana State.**ABSTRACT****INTRODUCTION**

Acute Appendicitis is the commonest abdominal surgical emergency in young adults all over the world. In early 1900s, Ochsner in Chicago and Sherren at the London Hospital were both advocates of conservative treatment in late cases. Appendicular perforation is a serious complication in view of the ensuing peritonitis with the consequent sequelae and morbidity.

**AIM**

To study the incidence, morbidity and sequelae of appendicular perforation.

**MATERIALS & METHODS**

This is a prospective study done in our hospital where 110 cases of peritonitis due to appendicular perforation were selected for our study. All the cases where peritonitis was due to appendicular perforation at laparotomy were included. The study period was from January 2014 to December 2015. The cases of peritonitis due to other causes like duodenal, gastric, enteric perforation were excluded. Patients with acute abdominal emergency with clinical diagnosis of peritonitis were examined carefully with detailed history and clinical examination. Necessary investigations were done and patients taken up for emergency surgery.

**CONCLUSIONS**

Acute Appendicitis is the commonest abdominal surgical emergency in young adults all over the world. Age incidence of appendicular perforation is maximum in the age group of 21–30 years. Next common age group is 31–40 yrs. Incidence is more in males. Male to female ratio is 2.4:1. Pain abdomen, vomiting, fever and anorexia were common symptoms in all the patients. Majority of the patients came late to the hospital accounting for the cause of perforation and subsequent mortality and morbidity.

**KEYWORDS**

Appendicular Perforation, Incidence, Morbidity, Sequelae.

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**INTRODUCTION:****INVESTIGATIONS:**

- I. ROUTINE:** WBC-total and differential counts, ESR, Haemoglobin level, complete urine examination, blood grouping and Rh typing, blood urea, and random blood sugar, serum creatinine and electrolytes.
- II. PLAIN X-RAY ABDOMEN** in erect posture for patients with generalised peritonitis where doubt exists between perforation and intestinal obstruction.
- III. ULTRASOUND ABDOMEN** in patients with clinical suspicion of appendicular mass and to exclude pelvic pathology.

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**DIAGNOSIS:** Was essentially clinical suspicion and final diagnosis could be made only after laparotomy.<sup>1</sup>

**PREOPERATIVE MANAGEMENT:**

1. Nil by mouth.
2. Ryle's tube aspiration.
3. I.V. Fluids to correct dehydration and shock.
4. Antibiotics: Inj. Taxim and metronidazole were given.
5. Oxygen inhalation for patients in shock.
6. Preparation of patients for emergency surgery after taking due consent.

**ANAESTHESIA:** 70 patients were operated under spinal anaesthesia and 40 were operated under general anaesthesia.

**SURGICAL PROCEDURE<sup>2, 3,4</sup>:****1. INCISION:**

- a) Grid iron incision with muscle splitting or cutting (McBurney's or Rutherford's) was made for patients when the diagnosis was definite and peritonitis was localised.

- b) Midline incision was given when the peritonitis was generalised.
2. Suction of pus was done after opening the abdomen.
3. Caecum and appendix were delivered into the wound.
4. Mesoappendix was delivered into the wound, clamped, cut and ligated.
5. Appendix was crushed at the base of when the perforation was at the tip, ligated and cut half a centimetre away. When the base of appendix was oedematous, simply ligated and cut.
6. Retrograde appendicectomy was done in retrocaecal appendix<sup>5</sup> and in cases where the appendix was perforated at the base or in the middle.
7. Peritoneal lavage done with warm normal saline.
8. Abdominal tube drain was kept and brought out through the right flank.
9. Abdomen was closed in layers.
10. Appendix sent for histopathological examination.

**POSTOPERATIVE MANAGEMENT:**

1. Nil by mouth till bowel sounds are heard.
2. Ryle’s tube aspiration intermittently every 2 hrs.
3. IV Fluids to maintain fluid and electrolyte balance till oral fluids are started.
4. Oral fluids were allowed on return of bowel sounds in increasing quantities.
5. Solid diet allowed 24 hours after commencing oral fluids.
6. Drain was removed once the output is minimum.
7. Taxim, Amikacin and Metronidazole were continued for 7 days.
8. Sutures were removed on 7th or 8th postoperative day.
9. Patients were discharged after suture removal.
10. All patients were followed up for a minimum period of one month.

**DISCUSSION:** <sup>6,7</sup>Acute appendicitis is the commonest abdominal surgical emergency all over the world.

<sup>7</sup>Perforation of inflamed appendix is a serious complication. Hence, early diagnosis and treatment are essential. In this series, 110 cases of appendicular perforation were studied in detail regarding age, sex, morbidity and mortality.

Total no. of surgical emergency cases are 3800 of which total no. cases of appendicular perforation are 110.

Surgeries performed at Gandhi Hospital:

Surgeries	No.
Total emergency surgeries	3800
Total acute appendicitis surgeries	1322
Total cases of appendicular perforation	110

**The clinical findings and management are discussed below:**

**AGE INCIDENCE:**

Youngest patient in this series is 8 yrs. old.  
 Most common age group is between 21-30 yrs. followed by 31-40 yrs.  
 Least common age group is 5-10 yrs.  
 Oldest patient is 60 yrs. old.

Age Group Years	No. of patients	Present Study	Campbell& MacPhail Series
0 – 10	02	1.8%	2.1%
11 – 20	24	21.8%	15.5%
21 – 30	34	30.9%	30.5%
31 – 40	28	25.44%	28.0%
41- 50	16	14.54%	20.0%
51 – 60	06	05.45%	07.2%
61 – 70	NIL	0%	0%

**SEX:** The incidence of appendicular perforation was more in males compared to females in this series, 78 out of 110 cases were males.

**Sex Ratio:** M: F - 2.43:1

Sex	No. of Patients	Present study	KINI Study
Males	78	71%	82%
Females	32	29%	18%
<b>Total</b>	110	100%	100%

**DURATION OF SYMPTOMS BEFORE ADMISSION:** Most of the patients with appendicular perforation were admitted to the hospital 2-3 days after the onset of symptoms.

Maximum duration is 20 days.

Minimum duration is 1 day.

The extent of peritonitis is in direct proportion to the duration of symptoms before admission.

Duration of symptoms Before admission	No. of Patients	Appendicular Perforation Sequelae	Percentage
1–2 days	33	Local Peritonitis	30.0%
2–3 days	50	Generalised Peritonitis	45.4%
3–5 days	15	Appendicular Mass	13.6%
5–10 days	10	Appendicular abscess	9.0%
20 days	01	Pelvic Abscess	0.9%

**SYMPTOMS & SIGNS:**

Symptoms <sup>6,8</sup>	No. of patients	Present Study	Campbell & MacPhail Series
Pain abdomen	110	100%	99%
Vomiting	95	86%	80%
Fever	80	72%	75%
Constipation	30	27%	54%
Distension of abdomen	20	18%	26%
Oliguria	20	18%	20%
Lump	5	4.5%	11%
Burning Micturition	3	2.7%	2%
SIGNS <sup>6,8</sup>			
Tenderness	110	100%	100%
Guarding	90	81.0%	80%
Rigidity	50	45.4%	40%

**Pain Abdomen:** Onset of pain is acute in all the patients. Initially, central abdominal origin later became generalised. Colicky pain became continuous.

The duration of pain is 2-3 days in 45.4% of patients, 1 day in 1.8% patients and 20 days in 0.9% of patients.

**Vomiting:** 86% of patients had 2-3 vomiting episodes after the onset of pain. Some patients had anorexia and some had both anorexia and vomiting.

27% of patients came with constipation and 18% with distension of abdomen.

**Fever:** Most of the patients had low-grade fever of 100<sup>o</sup> F – 101<sup>o</sup> F associated with pain, some had 104<sup>o</sup> F.

**Oliguria:** 185 of patients admitted with oliguria as a presenting feature.

**SIGNS OF DEHYDRATION & TOXAEMIA:** Seen in patients with generalised peritonitis.

Pulse rate:> 120/min.

Temperature: 101<sup>o</sup> F.

Respiratory rate:>30/min.

Low blood pressure.

Sunken eyes, dry tongue, cold clammy skin, rapid breathing due to fever, dehydration and metabolic acidosis. The degree of dehydration was directly proportional to the duration of symptoms.

**Bowel sounds:** Paralytic ileus was present in 90% of patients for 48–72 hours.

**INVESTIGATIONS:**

**BLOOD:** W.B.C. count was elevated beyond 14000/cu.mm in most of the patients. Polymorphonuclear leucocytosis was present in all the patients.

**ESR** – relatively raised in all the patients.

All of the patients were non-diabetics.

Blood urea was raised in direct proportion to the degree of dehydration.

Electrolyte estimation helped in correction of fluid and electrolyte imbalance.

**PLAIN X-RAY ABDOMEN ERECT:**

- Ground glass appearance with air fluid levels in 45% of patients.<sup>8</sup>
- Distended loops of small bowel with gas & fluid seen in 30% patients.
- Pneumoperitoneum seen in 1.8% of patients.
- Faecolith seen in 0.9% of patients.

**ULTRASOUND ABDOMEN:** Appendicular mass was detected in 4.5% patients.

**DETAILS OF SURGERY<sup>2,3,4</sup>:** All patients were taken up for surgery with an average duration of 6–12 hours after admission.

**ANAESTHESIA:**

General – 72% of patients.

Spinal - 27% of patients.

**INCISION:**

Midline incision – 68% of patients.

McBurney's incision – 31% of patients.

Rutherford Morrison's incision – 9% of patients.

**OPERATIVE FINDINGS**

- Pus - 80% cases.
- Pelvic Abscess - 1.8% cases.
- Appendicular Abscess – 9.09% cases.
- Appendicular mass - 9% cases.

**PROCEDURE:** Appendectomy with peritoneal wash was done in all patients with peritonitis and a tube drain kept. Drainage of abscess + appendectomy was done in patients who had appendicular abscess. Of the 10 patients who had appendicular mass at laparotomy, appendectomy was done in 9 patients. In one case, appendectomy could not be done so abdomen was closed.

**POSTOPERATIVE PERIOD:**

- Paralytic ileus will be present up to 48–72 hrs. in 90% of patients. Some patients had electrolyte imbalance which was corrected.
- Tube drain removed on 5<sup>th</sup> POD.
- Sutures removed on 7<sup>th</sup> POD or 8<sup>th</sup> POD in 80% of the patients.
- In 10% of patients, sutures were removed on 10<sup>th</sup> POD.
- Antibiotic Therapy: All toxic patients were treated with cefotaxime and Metrogyl. In some, cefoperazone and amikacin were used. Antibiotics were given for one week.

Appendix Biopsy<sup>9</sup>: Polymorph nuclear cell infiltration in mucosa, submucosa, muscularis propria in all cases.

### MORTALITY & MORBIDITY

Sl. No.	Complications	No. of Patients	Percentage
1	Wound infection	14	12.72%
2	Intestinal Obstruction	06	5.45%
3	Lung infection	06	5.45%
4	Wound dehiscence	04	3.63%
5	Septicaemia	03	2.72%
6	Intraperitoneal abscess	02	1.8%
7	Renal Azotaemia	01	0.9%
8	Incisional hernia	01	0.9%
9	Faecal fistula	01	0.9%
10	Burst abdomen	00	0%
11	Deaths	04	3.63%

69% of patients recovered uneventfully. Morbidity is seen in 27% of patients.

Wound infection developed in 12.72% of patients. E. coli & Klebsiella isolated sensitive to Cefotaxime and amikacin, 3.6% patients developed wound dehiscence which required secondary suturing, 6 patients developed intestinal obstruction, out of which 3 needed laparotomy while 3 were managed conservatively.

2 patients developed pelvic abscess, one required laparotomy, one was managed conservatively. Septicaemia and shock developed in 2.7% patients who died postoperatively.

**MORTALITY:** Mortality rate is 3.6%. 3 patients came with septicaemia and shock preoperatively who died within 6-12 hrs. after surgery. One 60-year-old female came 20 days after onset of symptoms in renal failure and died on 2nd POD.



**Fig. 1**

### CONCLUSIONS:

1. Acute appendicitis is the commonest abdominal surgical emergency all over the world. Perforation of inflamed appendix is a dangerous complication. Hence, early diagnosis and treatment are essential.
2. Age incidence of appendicular perforation is maximum in the age group of 21–30 years. Next, common age group is 31–40 years.
3. Male to female ratio 2.4:1.
4. Pain abdomen, vomiting, fever and anorexia were common symptoms in all the patients.
5. Majority of the patients came late to the hospital accounting for the cause of perforation and subsequent mortality and morbidity.
6. Mean duration of symptoms before admission is 3 days.
7. Degree of dehydration and toxicity and peritonitis are in direct proportion to the duration of symptoms before admission.
8. Past history of recurrent pain abdomen is present in few patients (10%).
9. History of worm infestation is present in 5% of patients.
10. The diagnosis was mainly based on clinical suspicion confirmed after surgery.
11. Appendix was either retrocaecal or ileal in most of the patients.
12. 45% of patients had generalised peritonitis, local peritonitis in 30%, appendicular mass in 13%, and abscess in 9%.
13. Duration of paralytic ileus is 48–72 hrs. in 80% of patients.
14. 69% patients had uneventful recovery. Morbidity is 27% - wound infection 12%, intestinal obstruction 5.4%, lung infection 5.4%, wound dehiscence 3.6%, intraperitoneal abscess 1.8%, incisional hernia 0.9%, faecal fistula 0.9%.
15. Mortality rate is 3.63%, all of them came to the hospital late with septicaemia and shock and died in the early postoperative period.
16. In view of morbidity and mortality, early diagnosis and early intervention of appendicitis is very important to prevent appendicular perforation and its sequelae.
17. Appendicectomy should be advised in doubtful cases of appendicitis to prevent its complications. Negative appendicitis at laparotomy is acceptable in 10 – 15% of cases.<sup>10</sup>

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