

A Comparative Study between Conventional and Laparoscopic Appendicectomy in Acute Appendicitis

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Abstract: Appendix is a vestigial organ which can get inflamed to cause appendicitis. It is the bread and butter of a surgeon who encounters this problem regularly. Appendicectomy is the surgery which is performed to remove the inflamed appendix. It can be achieved either by conventional open surgery or laparoscopic surgery. In this study an effort was made to compare the complications involved between conventional and laparoscopic appendicectomy in acute appendicitis. One hundred cases were considered for the study. Fifty cases were taken up for laparoscopic elective surgery and fifty cases were considered for elective laparotomy. The complications encountered were studied and compared.

Keywords: Appendix, Appendicectomy, Surgery, Laparotomy, Laparoscopy

1. Introduction

Among the vestigial organs in human body, the vermiform appendix may be the most vestigial. It has gained importance in surgical practice due to its propensity to become inflamed, otherwise known as acute appendicitis. Incidence of appendicitis is 11 per 10000 persons/year. Embryonic development of appendix occurs at 6th week as a outpouching of caudal limb of the midgut loop. By 5th month appendix elongates to its vermiform shape.

It is a 8-10 cm long structure located 2 cm posteromedial to the ileocaecal junction. It can be retrocaecal in 70% of cases, pelvic in 20%, preileal and postileal, subcaecal, paracaecal or subhepatic.

The mesoappendix or mesentery of the appendix is the continuation of the mesentery above. The layers of appendix are serosa, mucosa, submucosa which has rich lymphoid follicles.

The arterial supply to appendix is via the appendicular artery which is the branch of ileocolic artery. Accessory appendicular artery or artery of Sheshachalam also supplies the appendix. The veins follow the arteries and drain into superior mesenteric vein. The lymphatics drain into ilioocolic nodes, ileocaecal nodes and appendicular nodes.

Reginald Fitz first recognised acute appendicitis as a clinical problem. Charles McBurney described the clinical manifestations and the point of maximum tenderness in acute appendicitis. The junction of lateral 1/3rd and medial 2/3rd of a line drawn from anterior superior iliac spine to the umbilicus is called McBurney's point.

In Acute appendicitis the signs and symptoms suddenly appear. In infants appendicitis is rare. The incidence increases with age and peak incidence is seen in teenagers and early 20's. The incidence of appendicitis is small in age 30 years and above.

Appendicitis is a dangerous disease because chances of its perforation is high. Appendix is closed at one end/ cul-de-

sac hence the chances of it getting blocked are pretty high. Appendicular artery being an end artery, if obstructed then it may lead to appendicitis. The appendicular lumen is just 1-3 mm in diameter and the appendix has a thin muscular coat which can lead to easy perforation. Inflammatory oedema can cause easy thrombosis of appendicular artery.

Aetiology of appendicitis can be attributed to,

- Racial and dietary factors: Diet poor in dietary fibers and rich in carbohydrates can lead to appendicitis. White race are more prone to appendicitis.
- Familial susceptibility: In case of long retrocaecal appendix, blood supply to the tip of appendix is less which may lead to appendicitis.
- Obstruction of the lumen of appendix by faecoliths, ova, cysts of entamoeba, worms etc.
- Non obstructive appendicitis due to bacterial or viral infections.

The patient of appendicitis presents with severe colicky pain, initially at the umbilical region, which localises at right iliac fossa after few hours. Patient may also have low grade fever, anorexia, constipation and vomiting.

The clinical signs elicited are, cough tenderness, tenderness and rebound tenderness at the McBurney's point, guarding abdominal rigidity, palpation of left iliac fossa produces pain in right iliac fossa also known as Rovsing's sign, hyperaesthesia in Sherrin's triangle due to irritation of lower abdominal nerves.

The total WBC count is almost always above 10000 cells/mm cube. Abdominal ultrasound can be done to rule out other surgical causes of pain abdomen. In some rare cases when clinical diagnosis is not possible, Contrast Enhanced CT scan (CECT) is the investigation of choice.

The complications of acute appendicitis are rupture, appendicular mass, perforation and appendicular abscess.

The conditions which can mimic appendicitis are,

- In children, enterocolitis, Meckel's diverticulitis, worm ball, acute mesenteric lymphadenitis.

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- In young adults, right sided ureteric colic, amoebic typhlitis, torsion of undescended testis, Meckel,s diverticulitis.
- In Middle age, acute pancreatitis, perforated duodenal ulcer and acute cholecystitis.
- In females, ruptured ectopic pregnancy, pelvic inflammatory disease and torsion of ovarian cyst.

If the patient presents within 48 hours of pain abdomen, after relevant investigations and after establishing the diagnosis, the patient is admitted, IV fluids are started, second generation cephalosporin with metranidazole are given and open or laparoscopic appendicectomy can be advised.

In conventional appendicectomy Gridiron incision which is at a right angle to spino umbilical line placed at McBurneys point is used. It is 6-8cm in length. A cosmetically better Lanz incision which is transverse/curved placed at McBurneys point can also be used. The skin, subcutaneous tissue, external oblique aponeurosis, transverse and internal abdominal muscles are split, peritoneum is incised. By palpating the tenia coli, base of the appendix has to be reached. Appendix is held at meso appendix using a Babcock's forceps. The blood vessels at mesoappendix are divided. Purse string suture is applied around the base. The appendix is then crushed at the base, tight ligature is applied at the base and the appendix is cut. Then the stump is buried after cleaning with purse string sutures. This is followed by closure of abdominal layers.

Post operative complications are, fever, wound infection, intra abdominal abscess and faecal fistula.

The laparoscopic appendicectomy is advantageous in obese, elderly and in women. It has less post operative pain and is gaining popularity nowadays. Sometimes it may have to be converted to open appendicectomy.

The placement of ports may vary from surgeon to surgeon and previous abdominal scars. The surgeon stands on the patients left side and a video monitor is present at the patients right foot end. The operating table is slightly tilted so that the loops of small intestine are delivered from pelvis. The appendix is identified by finding the tinea and held by laparoscopic forceps. Appendix is elevated and a window is created in mesoappendix using dissecting forceps. The appendicular vessels are then ligated or coagulated. The free appendix is then ligated at the base and cut and removed from one of the operating ports. The incisions are then closed.

Semml in 1983 struggled to prove its superiority over the open technique³. Cholecystectomy while managed to get established as the gold standard for gallstone disease⁴ Open appendectomy has withstood the test of time for more than a century since its introduction by McBurney⁵. The overall mortality of Open appendectomy is around 0.3%; and morbidity, about 11%⁶.

Aims and Objectives

To study and compare the complications involved between conventional and laparoscopic appendicectomy in acute appendicitis.

2. Materials and Methods

One hundred cases were considered for the study. The study was done in the Department of General Surgery, Travancore Medical College, Kollam. Fifty cases were taken up for laparoscopic elective surgery and fifty cases were considered for elective laparotomy.

Inclusion Criteria

- 1) Patients age between 18 – 40 years were considered so that the age related bias was not found.

Exclusion Criteria:

- 1) Patients who were not belonging to the age group were not taken up for the study.
- 2) Patients in whom the other complications were seen were not considered for the study.
- 3) Patients who had other metabolic complications were not considered.

The antibiotic regime was completed and after taking all aseptic precautions the patients were treated by the surgical approach.

3. Results

Table 1: Complications in laparoscopic surgeries

Complications	
Hemorrhage	2
Fever	1
Pain	6
Infections	Nil
Wound dehiscence	Nil
Keloid formation	1

Table 2: Complications in conventional surgeries

Complications	
Hemorrhage	12
Fever	9
Pain	17
Infections	11
Wound dehiscence	4
Keloid formation	3

4. Discussion

Overall the complications were much higher in conventional method than the laparoscopic approach. In the conventional method, the haemorrhage was seen in twelve patients, the fever was complained in nine patients, the pain as seen in seventeen cases, the infections was seen in eleven cases, wound dehiscence was established in four cases and keloid formation was observed in three cases. In the laparoscopic method the haemorrhage was seen in two cases that was minimal, the fever was complained in one patients, the pain as seen in six cases, the infections was seen in not even a single case, wound dehiscence was established not in a single case and keloid formation was observed in one case.

5. Conclusion

Overall the complications were much higher in conventional method than the laparoscopic approach.

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