

Laparoscopic Appendectomy in Children: Preliminary Study in Tertiary Care Centre of Rural India

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Abstract:

Background: Acute appendicitis is most common in children, adolescents and young adults upto 25 years of age. The highest incidence is seen from age group 12-14 years. In acute appendicitis cases urgent appendectomy within 48 hours is recommended. This study is a preliminary level study in ESIC Medical College and Hospital placed in Bihta which is a peripheral area of Patna. This study focusses on the laparoscopic appendectomy.

Materials and Methods: Retrospective study performed on 24 paediatric patients over one year from November 2022 till November 2023 under the Paediatric Surgery Department of ESIC Medical College and Hospital, Bihta, Patna, Bihar. All the patients who underwent laparoscopic appendectomy for appendiceal pathology were included. Demographic, clinical, radiological and laboratory data along with the results of surgical treatment was recorded.

Results: The sample size was 24 paediatric patients, of which, 14 were boys and 10 were girls. The mean age was 8.5 years (6 years and 14years). The diagnosis before surgical exploration revealed 16 cases of acute appendicitis, 3 abscesses, and 5 appendicular lumps. 16 anterograde appendectomy and 8 retrograde appendectomy were done. Appendectomy was associated with a suction-washing in 3 appendicular abscess cases and 2 appendicular lump cases. Food vomiting, scapular pain and Douglas abscess were some operative complications seen. The mean operating time was 60 min (40 min–90 min).

Conclusion: Paediatric laparoscopic appendectomy procedure is one of the most effective and better surgical procedures in the present times. Although, it is still a debatable one when complicated appendicitis patients are being treated.

Keywords: Laparoscopic Appendectomy, Douglas Abscess, Paediatric Appendicitis.

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Introduction

Acute appendicitis in developing countries is the most common acute surgical problem encountered in the paediatric population [1]. Acute appendicitis is most common in children, adolescents, and young adults aged up to 25 years [2-4]. A "Lifetime risk" of acute appendicitis is estimated to be 8.7% for boys vs. 6.7% for girls [3, 4]. The incidence is the lowest in the neonatal period and the highest in the age group from 12 to 14 years [4]. Perforated acute appendicitis can occur in 20-35% of patients. In children younger than 3 years this risk is estimated to be 80-100%, most often because of children's inability to communicate and because of numerous frequent benign gastrointestinal disorders [5, 6].

Acute appendicitis requires urgent surgical treatment, which is recommended to be done in the first 48 hours since the onset of symptoms. The gold

standard in treating acute appendicitis is the appendectomy by Mc Burney [7].

The first appendectomy was performed by Claudius Amyand in 1735, whereas the first laparoscopic appendectomy was done over two centuries later in 1983 in adults, and even later in 1992 when the first paediatric laparoscopic appendectomy was done by Ure et al. [7].

Many authors have pointed out the wide acceptance of laparoscopic appendectomy in the management of all type of appendicitis in paediatric patients [8,9].

According to many studies, laparoscopic appendectomy in comparison with the open one applied in children results in less postoperative pain, shorter hospital stay, fewer postoperative complications, and a faster return to normal activities (10). In lapa-

roscopic appendectomy, the abdominal wall is exposed to smaller quantities of contaminated tissues and fluids, which results in a reduced risk of infection. This is particularly important for paediatric patients because of the high rate of perforated appendicitis [11].

Our study aims to make preliminary assessment of laparoscopic management of acute appendicitis in children in a rural placed medical college.

Material and Method

A retrospective study about patients incurring laparoscopic appendectomy in the period from November 2022 to November 2023 in the Paediatric Surgery Department, ESIC Medical college Bihta in our study we included 24 appendix patients. We used general anaesthesia with endotracheal intubation, nasogastric tube, and a urinary catheter. The patient is supine with the left arm along the body. The operator and his assistant are placed at the left of the patient and column laparoscopy is facing surgeons.

The umbilicus is gripped between two Kelly clamps, everted, and supraumbilical incision given and opened. The fascial hole is then expanded and the peritoneum opened with a pair of scissors. We introduce an 10mm trocar around the fascia hole. The laparoscope is introduced and port is fixed sideways. The CO₂ insufflation is started at a pressure of 10 mmHg and a flow rate of 4 L/minute. Two 5 mm trocars are then placed a finger's breadth above the pubic bone and on the left iliac fossa under the guidance of laparoscope.

A scanning optics and abdominal cavity and intestine is inspected. Appendix was visualised. Haemostasis is made by coagulating the mesoappendix sometimes with bipolar hook. For ligation of the appendicular base, we used catgut Endo loop. The Endo loop is threaded around the appendix and is tight at the base. The appendix section is made above the node and the appendix is immediately extracted through the 5mm working port.

Depending on the case a suction-washing is optionally performed with drainage. The trocars are removed under direct vision followed by a full exsufflation pneumoperitoneum. Camera port is tight in order to close the opening fascia. Trocar site of 5

mm is closed by prolene 3-0. A bandage is placed on the umbilicus for a period of 5 days.

All 24 patients were operated on by the same surgeon. The parameters studied were age, sex, clinical data, laboratory features, radiological data, and results of surgical treatment.

Results

We realized 24 appendectomies by laparoscopy in those 14 boys and 10 girls against 26 open appendectomies, like 48%. The mean age of patients was 8.5 years (6 years and 14years). The patients were examined after an average of 2 days (1 to 10 days) with abdominal pain and vomiting as predominant symptoms. An abdominal ultrasound performed in all patients confirmed the diagnosis of appendiceal pathology with increasing size of the appendix and infiltration of fat perished appendix. Laboratory tests included total leukocyte count, blood grouping, and prothrombin time. The diagnosis before surgical exploration revealed 16 cases of acute appendicitis, 3 abscesses, and 5 appendicular lumps. (Table:1) Appendectomy was postponed for 6 weeks after antibiotic therapy with ceftriaxone, amikacin and metronidazole in appendicular lump. Surgical exploration was performed after 3 days to 5 days and corrected preoperative diagnosis in 3 cases of appendicular abscess.

We performed 16 anterograde appendectomies and 8 retrograde appendectomies. Appendectomy was associated with a suction-washing in 3 cases of appendicular abscess, and 2 cases of appendicular lump. The establishment of a drain after peritoneal lavage was necessary in patients with appendiceal abscess. The drain was removed on the fifth postoperative day. The mean operating time was 60 min (40 min–90 min). No conversion to laparotomy was performed. Feeding was allowed one day after surgery for acute appendicitis while for appendicular abscess on the second or third postoperative day. The majority of patients was discharged on the second postoperative day. Operative complications were food vomiting in 3 patients, scapular pain in 2 patients, and abscess Douglas in 2 patients (Table 1). No parietal suppuration was noted. The average hospital stay was 5 days (2 and 6 days). After a mean of 8 months no other problems were noted. In the series there is no mortality.

Table 1:

	Acute appendicitis	Appendicular abscess	Appendicular lump
Sex (M/F)	9/7	0/3	4/1
Mean age (yrs)	8.75	9.6	8.2
Suction washing	0	3	2
Operative time	50mins	75mins	55mins
Conversion	0	0	0
Complications	0	Vomiting=3 Scapular pain=1 Douglas abscess=1	Vomiting=0 Scapular pain=1 Douglas abscess=1
Hospital stays(days)	3.5	6	4.5

Discussion

In Laparoscopy era we also contribute in paediatric laparoscopic procedure. Due to simplicity of surgical gesture in appendectomy is first indication followed by cholecystectomy. Appendectomy is the first indication followed by cholecystectomy; and then constituting an excellent tool apprenticeship to laparoscopic surgery [10]. The acute appendicitis is a childhood disease, more common in males [10]. These results are the same with ours that found an average age of 8.8 years, with 58% of males. In our study the indications of laparoscopy were more inclined towards acute appendicitis which constitutes 66% of the cases, in our context there are 8 complicated cases [8]. The high frequency of complicated appendicitis is secondary to long diagnostic delay. As the delay is long, the risk of complications increases [8]. In most cases the reasons of these complications are long delay, traditional medication, and inappropriate use of antibiotics [8].

Some authors estimate that 91% of acute appendicitis's are seen before 3 days [8]. In our series we had more acute cases with an average consultation within 2 days. Delay in diagnosis in 33% of our cases. Few authors illustrated by a study including all appendectomies, like a delay of 6 days and 74% of complicated appendicitis [8]. Clinical examination should be coupled with ultrasound when there is a doubt in diagnosis [14]. Sometimes ultrasound is responsible for false positive or false negative or even mistaking the anatomical shape [14]. Ultrasound nevertheless remains a gold standard for appendiceal pathology diagnosis [14].

However, in our current working centre that is in rural sited centre laparoscopy is still debated in complicated appendicitis because of the risk of morbidity like septic shock, gas embolism by expanded vessels consequence of CO₂ insufflation peritoneum [4], a lack of standardized antibiotic protocol governing the surgical procedure and low socioeconomic problems. For these reasons some paediatric surgeons still prefer open surgery for complicated appendicitis [8].

In our series preoperative intravenous antibiotic therapy was recommended in 40.6% of cases based on cephalosporins, aminoglycoside, and nitroimidazole. Postoperative antibiotic therapy was initially administered parenterally and on orally relay, with an average of 10 days of administration. Many combinations have been proposed in paediatrics. Several authors argue that antibiotic therapy is especially necessary in complicated appendicitis, and the treatment is started intraoperatively always pursuing parenteral postoperatively, with adaptation of the antibiogram, and relays orally after 48 hours of apyrexia [10]. Laparoscopy is more controversial in appendicular lump. In our series we had 5 complicated shapes that is case of appendicular lump op-

erated on after a 6 weeks with few weeks of antibiotics. Those complicated appendicitis have all benefited from an appendectomy and peritoneal toilet. 2 of our patients presented with a Douglas abscess that was treated with antibiotic therapy.

These data raise the interest of the Douglas drain in complicated appendicitis already advocated by some authors [8]. We should probably need a large-randomized study to hope to have recommendations on the usefulness of laparoscopic drainage of complicated appendicitis in our context. This complication has been reported by some authors [8]. The mean operating time during the study was 60 minutes conformable to that of the literature [10]. Laparotomy conversion varies between 0 and 11% with an average rate of 2.8%. The conversion to laparotomy is performed for appendiceal chest for an ectopic position of the appendix for a ruptured appendix or a Meckel's diverticulum [8]. In our series we have not made any conversion to laparotomy. Other conversion reasons such as coagulation disorders and technical difficulties are reported by other authors [12].

Laparoscopy provides the surgeon working comfort and precision answering the first basic rules of surgery "to see in order to properly operate" [13]. It is no longer considered a luxury but an important surgical breakthrough as it can resolve many problems encountered in open surgery. The promotion of paediatric laparoscopy in our country requires an extension of the many training centres to strengthen the technical facilities to lift up the learned society.

Conclusion

In modern era of laparoscopy; paediatric Laparoscopy is an appropriate effective and safe surgical approach especially in acute appendicitis. Laparoscopic procedure is still debatable in cases of complicated appendicitis like appendicular abscess and appendicular lump. Drainage of Douglas' pouch could be a valuable aid for the reduction of residual intraperitoneal collections in the management of complicated forms by laparoscopy.

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