LAPAROSCOPIC ASSISTED APPENDECTOMY IN CHILDREN. OUR EXPERIENCE OF FIRST 50 CASES AT TERTIARY CARE HOSPITAL RAWALPINDI

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ABSTRACT

Objective: To present an experience of the first 50 cases of appendectomy performed via laparoscopy assisted open technique.

Study Design: Descriptive case series.

Place and Duration of Study: This study was carried out at Pediatric Surgery department, Pak Emirates Military Hospital Rawalpindi, from Jan 2016 to Apr 2018.

Material and Methods: Fifty patients (<12 years old) diagnosed as cases of acute appendicitis were enrolled after ethical committee approval. The procedure was performed via three ports (4 ports if required). Appendix was brought out through the right iliac fossa port and appendectomy was performed by extracorporeal knotting technique. Operative time, position of appendix and postoperative complications were recorded. Data was expressed as means and frequency percentages.

Results: Out of 50 patients, 31 were male and 19 were females. The mean age of the patients was 7.99 ± 3.34 years. Forty one patients had acute appendicitis while 9 patients were diagnosed as appendicular mass. The mean operative time was 24.9 ± 7.42 minutes. There were no cases of surgical site infection. Thirty eight patients were operated via three ports while 12 patients required four ports. Three patients required conversion to open appendicectomy due to extensive adhesions or abscess. Post-operatively drain was placed in only 6 patients.

Conclusion: Laparoscopic assisted open appendectomy is a safe, quick and easy to learn technique in children which combines all the advantages of minimal access surgery with open appendectomy while reducing the number of complications associated with it. The technique has the added advantage of diagnostic laparoscopy over open surgery.

Keywords: Appendectomy, Laparoscopic assisted appendectomy, Laparoscopic surgery.

INTRODUCTION

Acute appendicitis is one of the most common surgical emergency presenting as acute abdomen in pediatric population. Acute appendicitis accounts for up to 8% of surgical admissions in children[1,2]. Laparoscopic appendectomy has gained popularity over the past few years since it was first introduced by Semm in 1983[3]. Laparoscopic appendectomy has become the gold standard procedure for acute appendicitis in the developed world. Traditionally, laparoscopic appendectomy is performed via three ports, however single port or two port techniques have also been described with variable outcomes[4]. The advantages of minimal access surgery over conventional appendectomy include better cosmesis, decreased postoperative pain, less postoperative wound infections, shorter hospital stay, and earlier recovery[5]. Laparoscopic assisted appendectomy is a hybrid technique (commonly performed by two ports) which is simple, easy to learn and combines the advantages of open appendectomy and laparoscopy of abdomen. It can be converted to open appendectomy or to completely laparoscopic approach by inserting accessory ports as and when required[6]. We present our experience of the first fifty cases of laparoscopic assisted appendectomy with the aim of highlighting the advantages and limitations of this procedure in the pediatric population.

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MATERIAL AND METHODS

From Jan 2016 to April 2018, a total of 50 consecutive patients (male and female) diagnosed as a case ofacute appendicitis on the basis of history, physical examination and ultrasonography presenting to Pediatric surgery department of Military Hospital, Rawalpindi were enrolled in the study after approval from hospital ethical review committee. Informed consent was taken from the parents or guardians of all patients. All appendectomies were performed by the same surgical team.The inclusion criteria included patients of both genders between the ages of 01 to 12 years. The exclusion criteria included patients with previous abdominal surgery, perotinitis and any known congenital anomaly. The sample size was calculated by WHO sample size calculator with taking absolute precision required as 10%, confidence level as 90%, anticipated population proportion as 76% (success rate of laparoscopy assisted appendectomy). The sample size came out to be 50 patients[7]. Pneumoperitoneum was created by inserting veress needle into the abdominal cavity through the umbilical cicatrix and insufflating CO2. After creating pneumoperitoneum a 5 mm or 10 mm trocar was then inserted into the abdominal cavity from the same site and diagnostic laparoscopy was done to confirm preoperative diagnosis, location of appendix and any adhesions. A 5mm port was inserted in the right hypochondrium or left iliac fossa. LigaSure was inserted through this port for dissection of meso-appendix. Once the base was localized, a 5 mm or 10 mm port was inserted at the McBurney's point. If the appendix was not a complicated one like perforated, Retrocecal or having adhesions; the appendix was grasped through this port by the help of a Babcock (endoscopic) or atraumatic grasper at the tip, pneumoperitoneum was deflated and the appendix was taken out of the abdomen. After delivery of appendix through the port, the base of the appendix was ligated with 2/0 Vicryl® extra-

Table: Location of Appendix according to gender

		Location of Appendix					Total
		Retrocecal	Paracecal	Pelvic	Preileal	Subhepatic	
Gender	Male	16	11	2	1	1	31
	Female	11	5	3	0	0	19
Total		27	16	5	1	1	50

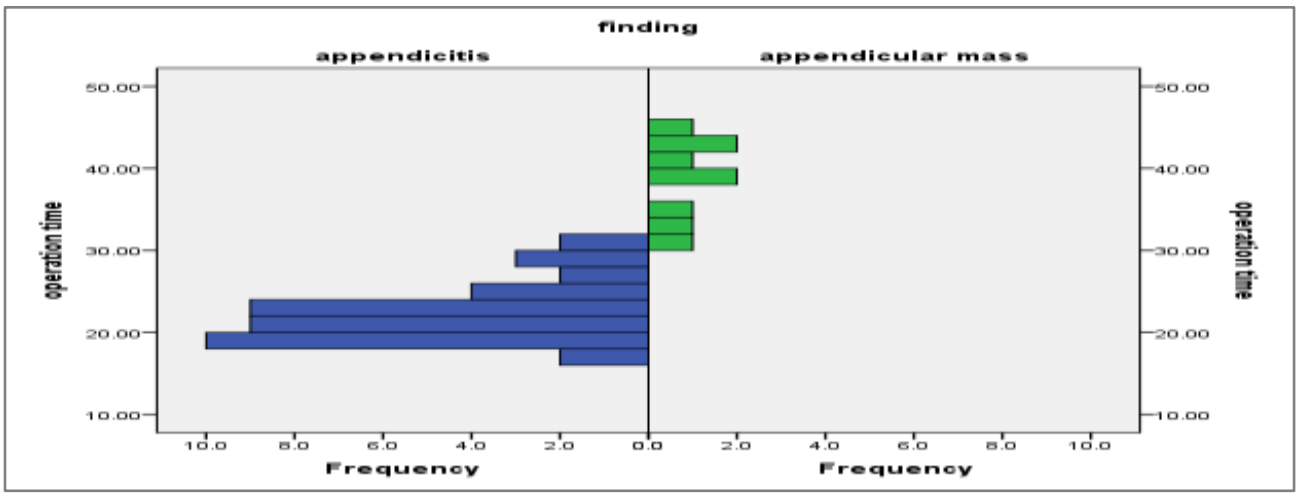

Figure-1: Distribution of patients according to operative time.

corporeally and, appendectomy was completed. Hemostasis was confirmed. Appendiceal stump was thenpushed inside the abdomen. The skin at both port sites was closed primarily with non-absorbable sutures. In complicated cases, like if the appendix was located in the retrocecal position with lots of peri-appendiceal adhesions, an additional port was inserted in the right upper quadrant or left lower quadrant. This helped in adhesiolysis and bipolar coagulation of meso-appendix when required. Thorough wound toileting/irrigation was done at the end of the procedure before wound closure. Demographic information including age, gender, and clinical symptoms were recorded on a predesigned proforma. Duration of surgery, hospital stay, and postoperative complications were also recorded. The data was analyzed by SPSS version 23. Mean and standard deviation was calculated for quantitative variables like operation time. Qualitative variables like gender, location of appendix, diagnosis and complications were expressed as frequency percentages.

RESULTS

Out of 50 patients, 31 (62%) were male and 19 (38%) were females. The male to female ratio was 1:1.63. The mean age of the patients was 7.99 ± 3.34 years (range 1-12 years). Forty one patients (82%) had acute appendicitis while[9] patients (18%) were diagnosed as appendicular mass/ abscess. The mean operative time was 24.9 ± 7.42 minutes (range 17-45 minutes). The mean operative time for cases of acute appendicitis was 21.95 ± 3.57 minutes (range 17-31 minutes) while that in cases of appendicular mass/ abscess was 38.33 ± 5.09 minutes (range 30-45 minutes). Out of 50 patients, 38 patients (76%) were operated via three ports while 12 patients (24%) required four ports. There were no cases of surgical site infection in our study. The success rate of laparoscopic assisted open appendicectomy in our patients was 94%. Three patients (6%) required conversion to open appendicectomy due to extensive adhesions or abscess and all these cases were of appendicular mass. Post-operatively drain was placed in 6 patients (12%) which was removed on first post-operative day in all 6 patients. The location of the appendix is mentioned in the following table. The most common location of appendix was retrocecal in 54% patients followed byparacecal (32%), pelvic (10%), pre-ileal (2%) and sub-hepatic (2%) patients. (table).

DISCUSSION

The advent of minimal access surgery has revolutionized the surgical practice over the past few decades. Various techniques have been developed and previous techniques modified for achieving better results. Early post-operative recovery, reduced rates of surgical site infections (SSIs), early mobility, shorter hospital stay and a quicker return to work have been the main advantages demonstrated by earlier researches[8,9]. Appendectomy is one of the most common emergency surgery performed in children all over the world. Likewise, laparoscopic appendectomy has replaced open appendectomy in most

Figure-2: Appendix brought out through the right iliac fossa port.

Figure-3: Appendiceal stump.

developed countries[10]. Since appendectomyis performed in emergency in majority of the cases, laparoscopic knot tying or surgical experience may not be available at all times. Secondly, diagnostic laparoscopy and proceed may be the best appropriate management option in some cases[6]. Abdominal pain is a common presentation in emergency departments and a difference in diagnostic error rate of appendicitis ranges from 12% to 23% for males and 24% to 42% for females[11]. A study by Golash *et al* in 2005 evaluated 1320 patients of abdominal pain with diagnostic laparoscopy and the diagnosis was changed in 30% cases. A definitive diagnosis was established in 90% of patients after diagnostic laparoscopy[12]. A definitive diagnosis was confirmed in 100% patients in our study. Laparoscopic assisted appendectomy was reportedto be a quicker method with less complications as compared to conventional laparoscopic appendectomy by Salo *et al* and Valioulis *et al* in children. Ninty four percent of patients operated via laparoscopic assisted appendectomy in our study were managed successfully.Valioulis *et al* reported a success rate of 76% whereas Salo *et al* reported a success rate of 86.9%.Wound infection has been reported to be up to 16%[7,13]. There was nocase of wound infection in our study. Malik *et al* in 2009 reported an infection rate of 5.3% from a study carried out at Jamshoro[14]. The conversion rate to open appendicectomy was 6% in our study which is comparable to the study by Valioulis *et al* who reported a conversion rate of 5.2%[14]. Konstadoulakis *et al* reported a conversion rate of 10.8%[15]. The mean operative time in our study was 24.9 ± 7.42 minutes which was better than the mean operative team reported by *Salo et al* of 47±16 minutes and Konstdoulakis *et al* of 47.5 minutes[13,15]. Laparoscopic assisted appendectomy has reduced operative time because of the advantage of extra corporeal stump ligation same as open appendectomy as compared to laparoscopic appendectomy. Our study is also the first study from Pakistan covering the pediatric age group. Further research is required on this subject alongwith studies comparing this technique with open appendicectomy and conventional laparoscopic appendicectomy.

CONCLUSION

Laparoscopic assisted openappendectomy is a safe, quick, efficient andeasy to learn in children which combines all the advantages of minimal access surgerywith open appendectomy while reducing the number of complications associated with it. The added advantage of diagnostic laparoscopy is significant to rule out other intra-abdominal pathologies. It provides detailed overview of the gut, the appendix and the internal genital organs especially in girls and offers more comfort to operating surgeonsin complicated cases. This technique can easily be converted to an open or completely laparoscopic approach and does not require a prolonged learning curve.

CONFLICT OF INTEREST

This study has no conflict of interest to declare by any author.

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