LAPAROSCOPIC APPENDECTOMY AS A STANDARD OF CARE FOR BOTH COMPLICATED AND UNCOMPLICATED APPENDICITIS

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ABSTRACT

BACKGROUND

In 1983, the selected cases of acute appendicitis management by laparoscopic appendectomy has gained increasing favour in the past decade, which was initially described by Semm. Less postoperative pain, shorter hospital stay, early return to work and better cosmesis are the benefits of LA, which is why it is considered as a minimal access surgery. These benefits of laparoscopic appendectomy have made this surgery attractive. Because of the advantage compared with open surgery, LA has been widely accepted, but not for management of all cases. In complicated cases, LA has complication rate and conversion rate led to questioning its safety. Due to lack of skill, LA has been quoted in literature as a contributing factor to high complication rate. In complicated cases of appendicitis, currently, there is no consensus regarding safety and feasibility of LA. The most common indications for emergent surgical intervention in children is acute appendicitis. It is treated by laparoscopic appendicitis, but its role in management is controversial in children. The management of complicated and uncomplicated cases of appendicitis by LA needs clarification in its safety issues. This study will suggest if LA can be used as a standard care for both complicated and uncomplicated cases of acute appendicitis.

MATERIALS AND METHODS

This study is a prospective study in which data was collected from August 2013 to November 2016 at Apollo Institute of Medical Sciences and Research, Hyderabad. An ethics clearance was obtained from institutional ethical committee. Some special investigations were done to diagnose the appendicitis. Inclusion Criteria- All patients with a preoperative diagnosis of acute appendicitis and who were performed an emergency LA. Exclusion Criteria- All patients with incidental appendectomies and interval appendectomies. Demographic data such as age and sex were collected.

RESULTS

A total of 500 patients were reviewed and 300 were included in the study. All these patients were offered LA. The age group between 23-85 years had majority of males (112) and females (50). Males contributed majority of the total population (65%). 200 were excluded due to incidental appendectomy, operated as elective case, managed nonoperatively and insufficient data. Out of 300 cases who were offered laparoscopic appendectomy, 270 cases were successful. In the four quadrant pus, the conversion rate was higher. Out of 300 cases, 95 cases were complicated and 105 were uncomplicated. In the complicated cases, majority had four quadrant pus (55), localised pus (35) and appendix mass (5). Relooks were 5%, intraoperative complications and postoperative complications were 1% and 4%. Morbidity and mortality were 2% and 1%.

CONCLUSION

This approach is possible in carefully selected patients and with appropriate basic laparoscopic skills and there was a positive outcome found in this study when LA was used in both complicated and uncomplicated cases of acute appendicitis.

KEYWORDS

Acute Appendicitis, Laparoscopy.

HOW TO CITE THIS ARTICLE: Bhuta RK. Laparoscopic appendectomy as a standard of care for both complicated and uncomplicated appendicitis. J. Evid. Based Med. Healthc. 2017; 4(62), 3770-3773. DOI: 10.18410/jebmh/2017/752.

BACKGROUND

In 1983, the selected cases of acute appendicitis management by laparoscopic appendectomy has gained increasing favour in the past decade, which was initially described by Semm. Less postoperative pain, shorter hospital stay, early return to work and better cosmesis are the benefits of LA, which is why it is considered as a minimal access surgery. These benefits of laparoscopic appendectomy have made this surgery attractive.[1,2] Because of the advantage compared with open surgery, LA has been widely accepted, but not for management of all cases. In complicated cases, LA has complication rate and conversion rate led to questioning its safety. Due to lack of skill, LA has been quoted in literature as a contributing factor to high complication rate. In complicated cases of appendicitis, currently, there is no consensus regarding safety and feasibility of LA. The most common indications for emergent

Financial or Other, Competing Interest: None.
Submission 20-06-2017, Peer Review 18-07-2017,
Acceptance 24-07-2017, Published 03-08-2017.
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DOI: 10.18410/jebmh/2017/752

surgical intervention in children is acute appendicitis. It is treated by laparoscopic appendicitis, but its role in management is controversial in children.[3,4,5] The management of complicated and uncomplicated cases of appendicitis by LA needs clarification in its safety issues. This study will suggest if LA can be used as a standard care for both complicated and uncomplicated cases of acute appendicitis.

MATERIALS AND METHODS

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RESULTS

Out of 500 cases, 300 cases met the inclusion criteria and hence were included in the study. 200 were excluded due to incidental appendectomy, operated as elective case, managed nonoperatively and insufficient data. Out of 300 cases, 95 cases were complicated and 105 were uncomplicated. In the complicated cases, majority had four quadrant pus (55), localised pus (35) and appendix mass (5).

300 Cases	
Complicated - 95 Cases	Uncomplicated - 105 Cases
Four quadrant pus - 55	
Localised pus - 35	
Appendix mass - 5	

Table 1. Shows the Division of Cases

Variable	Males	Females
Age in Years	N (%)	N (%)
0-15	30	22
16-22	53	33
23-85	112	50

Table 2. Shows Age Distribution and Sex Distribution

Table 2 shows that the age group between 23-85 years had majority of males (112) and females (50). Males contributed majority of the total population (65%).

	Total %, n	**Subgroup**
Successful LA	95%, 270	
Converted	4%, 30	Uncomplicated appendix-U(6)
		Appendicular mass-AM(0)
		Appendicular abscess-AA(8)
		Four quadrant pus-4QP(16)
Relooks, Total	5%, 15	Uncomplicated appendix-U(2)
		Appendicular mass-AM(0)
		Appendicular abscess-AA(4)
		Four quadrant pus-4QP(9)
Complications		
Intraoperative	1%, 3	4QP(2), U(1)
Postoperative	4%, 12	AA(2), 4QP(10)
Morbidity and Mortality		
Morbidity	2%, 6	
Mortality	1%, 3	U(1), AA(1), 4QP(1)

Table 3. Shows Results of Laparoscopic Appendectomy

Out of 300 cases who were offered laparoscopic appendectomy, 270 cases were successful. In the four quadrant pus, the conversion rate was higher.

DISCUSSION

Many studies have been reported regarding laparoscopic appendectomy. Fusi Mosai et al[6] conducted a descriptive analytical study was to describe the outcomes of using Laparoscopic Appendectomy (LA) as the standard of care for both complicated and uncomplicated cases of acute appendicitis in South Africa. A retrospective analysis of all patients who were diagnosed with acute appendicitis at Dr. George Mukhari Academic Hospital over a 3-year period was reviewed. Data were retrieved from our departmental database and analysed using descriptive statistics. A total of 746 patients were reviewed and 576 were included in the study. All these patients were offered LA. The mean age was 26.37 with 66% of our patients been males. Complicated cases formed 38% of our total study population. Laparoscopic appendectomy was performed in both complicated and uncomplicated cases of appendicitis with a success rate of 96%. Intraoperative complication rate and the relook rate was 0.5 and 7% respectively with an overall mortality of 1.7%. The positive outcome found in this study when LA was used in both complicated and uncomplicated cases of acute appendicitis suggests that this approach is possible in carefully selected patients and with appropriate basic laparoscopic skills. Lapo Bencini et al[7] conducted a study, which aimed to examine whether a difference exists in indications and outcomes between laparoscopic appendectomies performed by residents and those performed by experienced surgeons. Between 1999 and 2007, 218 laparoscopic appendectomies were performed and recorded. Data were analysed to compare operations performed by residents with those by experienced surgeons in terms of indications for surgery and severity of disease. Moreover, laparoscopic appendectomies were thoroughly compared regarding outcomes and complications. The residents had fewer conversions with laparoscopic appendectomy (8% vs. 17%, P=0.04), and similar complication rates (12% vs. 13%, P=0.16), compared with

experienced surgeons. The median operating time was also comparable (67 minutes vs. 60 minutes, P=0.23). However, patients operated on by residents had more emergencies (86% vs. 70%, P=0.009), included more foreigners (27% vs. 15%, P=0.03), and had intermediate-to-severe diseases, (81 vs. 52%, P<0.001) than patients did operated on by experienced surgeons. Surgical residents performed more emergency laparoscopic appendectomies on foreign patients suffering from intermediate-to-severe diseases compared with experienced surgeons with comparable surgical outcomes and lower conversion rates. Kurtz RJ, Heimann TM et al[8] conducted a study in which appendectomy can be performed using either a laparoscopic or an open technique. This study compares the outcome of patients treated for acute appendicitis by open appendectomy with the outcome of those undergoing laparoscopic appendectomy. Patients undergoing appendectomy at The Mount Sinai Hospital between 1994 and 1998 were studied. Outcome of patients having open appendectomy was compared with that of patients having laparoscopic appendectomy. Seven hundred and fifty eight patients underwent appendectomy for acute appendicitis during the 5-year study period. Two hundred and seventy one (36%) had open appendectomy and 487 (64%) had laparoscopic appendectomy. Patients subsequently found to have a normal appendix had the highest rate of laparoscopic appendectomy, whereas those with gangrenous appendicitis were most likely to have open appendectomy (P <0.05). There was a significant decline in the postoperative length of stay for open cases during the length of the study. In the final year, the difference in length of stay between open and laparoscopic appendectomy was only 1 day. Patients with gangrenous appendicitis had a significantly longer length of stay than did patients with a normal appendix or suppurative appendicitis. The hospital cost of laparoscopic appendectomy was greater than that for open appendectomy, but the extra expenditure in the operating room was offset by the longer length of stay of the patients having open surgery. Differences in outcome between open and laparoscopic appendectomy are minor. In this study, more difficult cases with gangrenous appendicitis were more likely to require open appendectomy, whereas milder forms of appendicitis, especially in women were more likely to be treated by laparoscopy. Savings from the slightly shorter hospital stay after laparoscopic appendectomy are offset by the higher surgical cost of the laparoscopic equipment. Yeuh Ming Lin et al,[9] the aim of this study was to investigate the results of LA in both complicated and uncomplicated cases of acute appendicitis. From January to December 2009, 94 patients with acute appendicitis underwent LA by the same surgeon using the three-port technique. Data were accumulated and compared between complicated and uncomplicated acute appendicitis. Of the 94 patients (45 women and 49 men), 19 had complicated and 75 uncomplicated acute appendicitis. The group with complicated acute appendicitis as compared to the uncomplicated group was significantly older (55.7 ± 20.5 years vs. 41.0 ± 18.0 years) and had a significantly increased operation time (117.6 ± 45.5 minutes vs. 78.2 ± 39.4 minutes), longer length of hospital stay (9.0 ± 3.3 days vs. 5.2 ± 6.0 days) and higher conversion rate (21.1% vs. 2.7%). No increase in surgical complications was noted in patients with complicated acute appendicitis as compared to those with uncomplicated acute appendicitis. This study demonstrated no increase in surgical complications after LA in patients with complicated acute appendicitis when compared with those who had uncomplicated disease. Therefore, LA maybe considered the first-choice treatment option for both uncomplicated and complicated acute appendicitis. Ching Chung Tsai et al[10] conducted a study in order to evaluate whether laparoscopic appendectomy was an alternative therapeutic tool to open appendectomy for all stages of paediatric appendicitis. Between January 2000 and November 2004, the charts of 177 children who underwent appendectomy by a single surgeon were reviewed. The patients were divided into open and laparoscopic appendectomy groups. Each group was subdivided into three stages- simple appendicitis, perforated appendicitis and appendicitis with abscess. The age, gender, white blood cell count, absolute neutrophil count, C-reactive protein, operating time, duration of postoperative hospital stay, minor and major complications and use of intravenous analgesia were recorded. Fisher's exact and Student's t-test were used for statistical analysis. There were fewer minor complications (9/32 vs. 0/20, p 0.009) in perforated appendicitis stage and fewer major complications (9/26 vs. 1/24, p Z 0.011) in appendicitis with abscess stage between open and laparoscopic appendectomy group. But, surgery for each laparoscopic appendectomy group took longer to perform than for the corresponding open appendectomy group in each stage (p <0.05). There was no significant difference in other data between corresponding groups in each stage. Laparoscopic appendectomy maybe considered a better alternative to open appendectomy for children with perforated appendicitis and appendicitis with abscess.

CONCLUSION

This approach is possible in carefully selected patients and with appropriate basic laparoscopic skills and there was a positive outcome found in this study when LA was used in both complicated and uncomplicated cases of acute appendicitis.

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