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Original Research Article

Prospective Comparative Study of Laparoscopic Appendectomy Versus open Appendectomy

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Abstract

Aim: The aim of the present study to compare laparoscopic appendectomy versus open appendectomy. **Methods:** This Prospective and observational study was done in the Department of Surgery, JJNKTMCH, Madhepura, Bihar, India, for 1 year. Totally 160 Patients with clinical diagnosis of acute or recurrent appendicitis with necessary investigations were included in this study. Post operative pain using a visual analogue pain scale and duration of analgesic used in number of days and post operative complications like vomiting, ileus, abdominal abscess and wound infection were compared in both the group. **Results:** In this study 55(68.75%) patients of open appendicectomy and 35(43.75%) patients of laparoscopic appendicectomy were males. 25(31.25%) patients of open appendicectomy and 45(56.25%) laparoscopic appendicectomy were females. The mean age of the patients in two groups was 24.8 ± 8.77 years and 23.5 ± 7.61 years, respectively. Open appendicectomy is less time (45.3 ±10.63) consuming than laparoscopic appendicectomy (65.6 ± 20.69). The average pain score was 2.7 ±0.25 in open group as compared to 1.5 ±0.39 in laparoscopic group with p value <0.05 which was statistically significant. There is significant reduction in incidence of post operative wound infection in laparoscopic group. The laparoscopic appendicectomy significantly reduced the hospital stay (P<0.05). **Conclusion:** The laparoscopic appendicectomy was better than the open appendicectomy with respect to pain score, lesser use of analgesics and post operative complications.

Keywords: Appendicitis, appendicectomy, laparoscopic appendicectomy, open appendicectomy

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Introduction

Historically Claudius Amy and a surgeon at St. George's Hospital, London in 1735 was the first to do appendectomy operation. In 1889, Charles McBurney introduced famous open appendectomy through incision and muscle splitting approach for which continued to be used until the late 20th century. In 1983, Semm (a German gynecologist) performed the first laparoscopic appendectomy, Subsequently, Pier et al., reported on a large case series of laparoscopic

appendectomy for acute appendicitis and demonstrated that this technique was safe and could achieve the same results as open appendectomy.[1,2] With the great advances in technology and the surgical techniques, laparoscopic appendectomy has become the novel alternative in the treatment of appendicitis in the last 2 decades. The indications for laparoscopic appendectomy remain controversial, despite the publications of numerous randomized trials, which compared open and laparoscopic appendectomy. Some studies failed to demonstrate clear advantages of LA over OA.[3,4] Some authors consider laparoscopic appendicectomy a promising method regarding its less invasiveness with shorter hospital stays, less postoperative pain, less incidence of surgical site infections and reduced the risk of post-operative adhesions. Other authors consider that it has prolonged operative time & higher cost.[5] Some studies have established that laparoscopic appendectomy has a higher incidence of intraabdominal abscesses and difficult applicability particularly in complicated appendicitis. Besides, the risk of organ specific injuries is considered by some authors to be higher in laparoscopic appendectomy than in open appendectomy although laparoscopic appendicectomy has a better view of the peritoneal cavity that in turns enables safe exploration.[6] Generally all laparoscopic procedures are more time consuming for the following reasons: Inherent nature of slow maneuver of laparoscopic techniques, time taken by careful slow insufflation, and routine diagnostic laparoscopy before starting any laparoscopic procedure.[7]

Material and Methods

This Prospective comparative study was done in the Department of Surgery, Jannayak Karpoori Thakur Medical College & Hospital, Madhepura (JNKTMCH), Bihar, India, for 1 year. after taking the approval of the protocol review committee and institutional ethics committee. Totally 160 Patients with clinical diagnosis of acute or recurrent appendicitis with necessary investigations were included in this study. Patients who didn't give consent, children below the age of 10 years, pregnant women and cases of complicated appendicitis were excluded from this study.

Methodology

The following parameters were observed during follow up in comparison between two procedures, post operative pain using a visual analogue pain scale and duration of analgesic used in number of days. Post operative complications like vomiting, ileus, abdominal abscess and wound infection. Patients in both study groups were discharged as soon as possible and duration of stay after surgery and duration of analgesics used after surgery in number of days is noted. Wound infection was defined as discharge of pus that required surgical drainage. Intra abdominal abscess was defined as a fluid collection diagnosed at Ultrasonography or computed tomography which contained pus at ultrasonographically guided aspiration Presented proforma was used to collect the relevant information.

Results

Table 1 depicts that in the present study 55(68.75%) patients of open appendicectomy and 35(43.75%) patients of laparoscopic appendicectomy were males. 25(31.25%) patients of open appendicectomy and 45(56.25%) laparoscopic appendicectomy were females. The mean age of the patients in two groups was 24.8 ± 8.77 years and 23.5 ± 7.61 years, respectively.

Table 1: Demographic and Preoperative Clinical Data

Characteristic	Open Appendicectomy	Laparoscopic Appendicectomy
Frequency	80	80
Gender		
Male	55(68.75%)	35(43.75%)
Female	25(31.25%)	45(56.25%)
Mean Age	24.8 ± 8.77	23.5 ± 7.61
Co-morbidities		
Hypertension	4	2
Diabetes Mellitus	3	1
COPD	2	1
CAD	1	1

Table 2: Duration of Surgery

	Appendicectomy	
	Open	Laparoscopic
Mean Duration Of Surgery	45.3 ±10.63	65.6 ± 20.69

Table 2 shows that open appendicectomy is less time (45.3 ±10.63) consuming than laparoscopic appendicectomy (65.6 ± 20.69).

Table 3: Post Operative Pain Score

	Appendicectomy		Statistical Analysis	
	Open	Laparoscopic	T Value	P Value
Pain Score	2.7 ± 0.25	1.5 ± 0.39	7.15	<0.05*

*P value significant

Table 3 depicts that in the present study average pain score was 2.7 ±0.25 in open group as compared to 1.5 ±0.39 in laparoscopic group with p value <0.05 which was statistically significant.

Table 4: Post Operative Complications

Complication	Appendicectomy		P Value
	Open	Laparoscopic	
Vomiting	15(18.75%)	7(8.75%)	<0.05*
Abdominal Abscess	5(6.25%)	0(0%)	>0.05
Wound Infection	13(16.25%)	3(3.75%)	<0.05*
Ileus(Hours)	30.77± 7.88	19.12± 6.67	<0.05*

*P value significant

Table 4 depicts that post operative complications like vomiting and ileus were lower in laparoscopic group. There is significant reduction in incidence of post operative wound infection in laparoscopic group.

Table 5: Post operative Stay

Hospital Stay	Appendicectomy	
	Open=80	Laparoscopic=80
1 day	0	10
2 days	0	35
3 days	10	26
4 days	56	9
5-9 days	5	0
10-15 days	9	0
P Value	<0.05*	<0.05*

*P value significant

Table 5 shows that laparoscopic appendicectomy significantly reduced the hospital stay (P<0.05).

Discussion

Acute appendicitis is the most common indication for abdominal surgery with a life-time incidence between 7 to 9 percent. Appendicectomy is one of the operations which are most commonly performed by the general surgeons. Open appendectomy (OA) has been the gold standard for the treatment of acute appendicitis. Laparoscopic appendicectomy (LA) has evolved since the first performed by a German Gynecologist Semm K. Laparoscopic appendicectomy has gained acceptance as a diagnostic and treatment method for acute appendicitis with the technological advances of the past two to three decades. Since then, this procedure has been widely used.[8] In spite of its wide acceptance, there remains a continuing controversy in the literature regarding the most appropriate way of removing the inflamed appendix. In the present study 55(68.75%) patients of open appendicectomy and 35(43.75%) patients of laparoscopic appendicectomy were males. 25(31.25%) patients of open appendicectomy and 45(56.25%) laparoscopic appendicectomy were females. The mean age of the patients in two groups was 24.8 ± 8.77 years and 23.5 ± 7.61 years, respectively. Table 2 shows that open appendicectomy is less time consuming than laparoscopic appendicectomy. Similar observations have also been reported by other studies.[9,10] A meta-analysis of randomized controlled trial has been reported with outcomes for 3000 patients. The mean operating time was 18 minutes longer for laparoscopic appendicectomy.[11] A prospective randomized trial comparing laparoscopic appendicectomy with open appendicectomy was conducted in 158 patients by Hansen *et al*.[12] reported that despite of longer operating time, the advantages of make it a worthwhile alternative for patients with acute appendicitis. In the present study average pain score was 2.7 ±0.25 in open group as compared to 1.5 ±0.39 in laparoscopic group with p value <0.05 which was statistically significant. The similar studies done showed the incidence of emesis was lesser and post operative ileus lesser in laparoscopic group.[13,14] Post operative complications like vomiting and ileus were lower in laparoscopic group. There is significant reduction in incidence of post operative wound infection in laparoscopic group. The return to normal activity was low for laparoscopic group compared to open group. Similar findings were observed in other studies also.[15,16] Marzouk M *et al*.[17] showed laparoscopic appendicectomy significantly improved the postoperative wound infection rate. There is significant reduction in incidence of post operative wound infection in

laparoscopic group. Laparoscopic appendectomy was associated with a shorter hospital stay. Other studies have shownsimilar findings.[18,19]

Conclusion

The laparoscopic appendicectomy was better than the open appendicectomy with respect to pain score, lesser use of analgesics and post operative complications. Post operative recovery was good in respect with duration of hospital stay, return to normal work. The only drawback of laparoscopic appendicectomy was with the duration of surgery. Overall laparoscopic appendicectomy is better than open appendicectomy in selected patients with acute or recurrent appendicitis. The laparoscopic approach is a safe and efficient operative procedure in appendectomy and it provides clinically beneficial advantages over open method.

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