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Original Research Article

Conventional versus small incision appendectomy: a retrospective randomized controlled trial study

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ABSTRACT

Background: Open appendectomy is practiced for more than a century and in the recent times small incision appendectomy is also practiced frequently. The efficacy of conventional appendectomy and small incision appendectomy in terms of pain, operating time and duration of hospital stay and have produced conflicting results. Hence this study was conducted to assess the same.
Methods: A hospital based randomized controlled trial study was conducted among the patients with appendicitis undergoing surgical intervention for the same in department of general surgery in Sri Muthukumaran Medical College Hospital and Research Institute, Chennai, during the study period from January 2017 to December 2019. A total of eighty cases with acute appendicitis were included in the study. Group A (n=40) includes conventional open appendectomy cases and group B (n=40) includes small incision open appendectomy cases. Data entry was done using Microsoft excel and data was analyzed using SPSS version 17.
Results: Blood loss, post-operative pain scores on day 1 and day 2, duration of hospital stay were found to be reduced in Small incision open appendectomy group compared to conventional open appendectomy group. Duration taken to resuming the normal activities and the complications were found to be similar in both conventional and small incision appendectomy group and small incision open appendectomy group.
Conclusions: Small incision open appendectomy is superior to conventional open appendectomy in terms of length of hospital stay, return to normal activity, blood loss and postoperative pain scores, which are considered the major advantages of minimally invasive surgery.

Keywords: Open appendectomy, Conventional, Small incision, Pain, Duration of hospital stay

INTRODUCTION

This is an exciting time in medicine. The pace of Acute appendicitis is one of the most common intra-abdominal surgical emergencies with a lifetime risk of 8.6% and 6.7% among males and females, respectively.[1] Treatment of choice for acute appendicitis is appendectomy. Both conventional open appendectomy (COA) and Small incision open appendectomy (SIOA) are commonly practiced.

Open appendectomy is the treatment of choice for more than a century since its introduction by McBurney in 1894.[2] Since then gold standard treatment for acute appendicitis has been open appendectomy due to its efficient outcomes. Kurt Semm was the first who described laparoscopic appendectomy in 1983.[2] Small incision open appendectomy has been shown to be feasible and safe when compared to conventional open appendectomy. Small insision open appendectomy also has advantages in terms of fewer wound infections, less pain, faster recovery and earlier return to normal activity.

With several advantages, small incision open appendectomy has fewer disadvantages like consumes more operating time.[3-5]

Various randomized and nonrandomized studies compared the efficacy of conventional open versus small incision appendectomy in terms of pain, operating time and duration of hospital stay and have produced conflicting results.[6-10] Hence this study was planned to assess the efficacy of small incision open appendectomy and conventional open appendectomy in terms of post-operative pain, duration of hospital stay, time taken to start regular works and its associated complications.

Objectives

The objective of this study is to assess the efficacy of small incision open appendectomy and conventional open appendectomy in terms of post-operative pain, duration of hospital stay and time taken to start regular works and its associated complications.

METHODS

A hospital based randomized controlled trial study was conducted among the patients with appendicitis undergoing surgical intervention for the same in department of general surgery in Sri Muthukumaran Medical College Hospital and Research Institute, Chennai, during the study period from January 2017 to December 2019. All patients with acute appendicitis both sexes were included in the study. Patients less than 12 years of age and patients with delayed presentation leading to appendicular mass or abscess were excluded from the study. With mean VAS for pain as 4.0 and 3.4 and sigma of 0.9, alpha 0.05 and power of 0.80, the sample size was calculated as thirty-six in each group. Hence it was rounded to forty cases in each group and a total of eighty cases with acute appendicitis were included in the study. All the participants who underwent surgery during the study period were included in the study, till the desired sample size was reached.

The individual participants were explained about the study and they were also assured that, their identity would be kept strictly confidential and they have the option to refuse participation in the study. Written informed consent was obtained from the study participant's parents prior to the interview. Every effort was made, to be sure that all information collected from the participants, remain confidential.

All the patients were randomised to either group A or group B with forty patients in each group, based on the computer generated random numbers. All the patients in the group A underwent conventional open appendectomy whereas all the patients in group B underwent small incision open appendectomy. In conevntional appendectomy, classic McBurney's incision as an oblique incision made in the right lower quadrant of the abdomen, placed at the junction of lateral one-third and medial two-third of the spinoumbilical line where as in small incision appendectomy a skin crease incision of 2 centimeters long was made at 2 centimeters medial and 2 centimeters below the anterior superior iliac spine.

After allocation of the patients in each group, the principal investigator collected the clinical history and conducted a detailed examination of the patients. The study was conducted using a proforma with the demographic and clinical details noted on it, Patients were evaluated for clinical presentation and surgical outcome in terms of pain, operating time, duration of hospital stay and complications.

Primary outcome measure was postoperative pain which was measured using visual analog scale (VAS) with score ranging from 0-10. Secondary outcome measures include operative time, duration of hospital stay, return to normal activities and postoperative complications. Data entry was done using Microsoft excel and data was analyzed using statistical package for social sciences (SPSS) version 17. All descriptive data were described as frequency, percentage, mean and standard deviation. The significant difference in the mean and proportions between the two groups was tested using the independent sample t test and z test respectively. Statistical testing was undertaken considering p value<0.05 to be significant.

RESULTS

In this study, among the group A participant, there were 57.5%, 20%, 17.5% and 5% belongs to age group 21-40 years, less than or equal to 20 years, 41-60 years and more than 60 years, respectively. Similarly, in group B, there were 47.5%, 32.5%, 17.5% and 2.5% belongs to age group 21-40 years, 41-60 years, less than or equal to 20 years and more than 60 years, respectively. Group A includes 55% of male and 45% female study participants whereas group B includes 47.5% of male and 52.5% of female participants (Table 1). The presenting complaints (multiple responses) of the study participants are shown in the Figure 1.

Table 1: Characteristics of patients in both groups.

Variables	Group A (n=40)	Group B (n=40)
	N (%)	N (%)
Age group (years)		
≤20	8 (20)	7 (17.5)
21-40	23 (57.5)	19 (47.5)
41-60	7 (17.5)	13 (32.5)
>60	2 (5)	1 (2.5)
Sex		
Male	22 (55)	19 (47.5)
Female	18 (45)	21 (52.5)

Mean operative time in group A and group B was found to be 54.6±12.4 minutes and 58.6±11.7 minutes but the difference was found to be statistically insignificant (p=0.1419). Blood loss during the surgical procedure was found to be 90.5±31.5 ml and 45.3±20.2 ml in group A and group B, respectively and the difference was found to be statistically significant (p<0.0000).

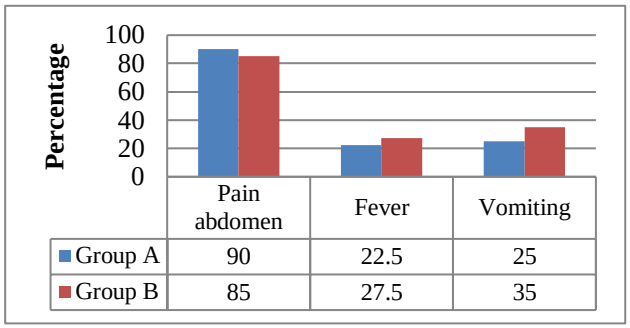

Figure 1: Proportion of cases with different presenting complaints.

Post-operative pain score on day 1 was reported to be 5.7±3.4 and 4.4±2.1 in group A and group B, respectively (p=0.0430) and on day 2 it was reported as 3.6±2.4 and 2.7±1.5 in group A and group B, respectively (p=0.0478). Also the duration of hospital stay was 3.6±1.2 days and 2.7±1.1days in group A and group B, respectively (p=0.0008) while the resuming normal activities was taken place early in group A and group B was found to be 12.7±3.2 days and 12.5±2.6 days but the difference was found to be statistically insignificant (p=0.7598) (Table 2).

Proportion of cases with complication was found to be 12.5% and 10% in group A and group B, respectively with no statistical significance (p=0.7251). on assessing the individual complication in group A, there were 5% of cases with wound infection and 2.5% of cases with each intra-abdominal abscess, ileus and wound dehiscence whereas in group B there were 2.5% of cases with each wound infection, ileus and intra-abdominal abscess with no cases of wound dehiscence were noted (Table 3).

Table 2: Comparison of different operative variables between two groups.

Various days	Group A	Group B	P value
Operative time (mins)	54.6±12.4	58.6±11.7	0.1419
Blood loss (in mls)	90.5±31.5	45.3±20.2	<0.0000*
Post-operative Day 1- pain score	5.7±3.4	4.4±2.1	0.0430*
Post-operative Day 2 - pain score	3.6±2.4	2.7±1.5	0.0478*
Duration of stay in hospital (in days)	3.6±1.2	2.7± 1.1	0.0008*
Return to normal activities (in days)	12.7±3.2	12.5±2.6	0.7598

*Significant

Table 3: Proportion of patients with complications in both groups.

Complications	Group A	Group B	P value
No. of cases with complications	5 (12.5)	4 (10)	0.7251
Individual complication			
Wound infection	2 (5)	1 (2.5)	0.5587
Intra-abdominal abscess	1 (2.5)	1 (2.5)	1.000
Ileus	1 (2.5)	1 (2.5)	1.000
Wound dehiscence	1 (2.5)	0	-

DISCUSSION

In the present study, blood loss, post-operative pain scores on day 1 and day 2, duration of hospital stay were found to be reduced in small incision open appendectomy group compared to conventional open appendectomy group. Duration taken to resuming the normal activities and the complications like wound infections, intra-abdominal abscess, ileus and wound dehiscence were found to be similar in both conventional and small incision open appendectomy group.

Seyed et al conducted a study and reported that there was no significant difference between postoperative complications in the conventional and small incision open appendectomy groups. The amount of pain medication administered during the hospital stay in the small incisopn appendectomy group was significantly lower than the conventional appendectomy group.[11]

A new small access incision was introduced by Malik et al.[12] The incision is 1.5 to 2 cm in length, located in the middle third of the lateral third of the spinoumbilical line, lateral to McBurney's point. It has been shown that appendectomy using this method is feasible in children with advantages of less postoperative pain, shorter hospital stay, and better cosmesis.[12]

Sundaravathanan et al performed a study and reported that with small incision open appendectomy the average

operating time was 25 minutes and there were no post-operative mortality and patients had minimal post-operative pain.[13]

Ling L et al performed a case study and reported similar results for small incision appendectomy.[14]

Saurland et al in the Cochrane database review analyzed 54 studies comparing laparoscopic appendectomy versus open appendectomy and observed that the operative time and cost in laparoscopic is significantly higher.[15]

Shah B et al concluded that small incision open appendectomy is better than laparoscopic appendectomy in terms of operative time, time to return to daily activity and complications and that the cost was higher in laparoscopic group compared to small incision open appendectomy group.[16]

Sanjay et al reported that in their study conducted with small incision open appendectomy, there was no mortality and negligible morbidity in the form of wound infection, anterior abdominal wall haematoma, subcutaneous emphysema.[17] Better cosmesis and almost invisible scar is the hallmark of small incision open appendectomy. Time to return to work was 8.2 days and success rate of small incision open appendectomy was 96%.[17] Sanjay et al performed a study and reported that small incision open appendectomy has definite edge over conventional-appendectomy in terms of operation time, analgesics used, post-operative hospital stay and return to work hence can be a safe alternative to conventional open appendectomy.[18]

Limitations

As this study was done in single center, the surgeons approach and surgical techniques could be varied from other surgeons and centers. Hence multicentre studies could be more appropriate.

CONCLUSION

This study proves that small incision open appendectomy is superior to conventional open appendectomy in terms of length of hospital stay and postoperative pain scores which are considered the major advantages of conventional appendectomy. However, it should also be noted that concerns about increased postoperative complications with the small incision open appendectomy and small incision open appendectomy approaches for appendicitis, which seem to be alarming and detailed studies are needed in order to assess the in depth of the causes associated with it.

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REFERENCES

1. Addiss DG, Shaffer N, Fouter BS, Tauxe RL. The epidaemiology of appendicitis and appendectomy in the United States. Am J Epidemiol, 1990;132:910-25.
2. Guller U, Hervey S, Purves H, et al. Laparoscopic versus open appendectomy: outcomes comparison based on a large administrative database. Ann Surg. 2004;239:43–52.
3. Ortega AE, Hunter JG, Peters JH, Swanstrom LL, Schirmer B. Laparoscopic Appendectomy Study Group. A prospective, randomized comparison of laparoscopic appendectomy with open appendectomy. Am J Surg. 1995;169:208 –13.
4. Hellberg A, Rudberg C, Kullman E, et al. Prospective randomized multicentre study of laparoscopic versus open appendicectomy. Br J Surg. 1999;86:48–53.
5. Heikkinen TJ, Haukipuro K, Hulkko A. Cost-effective appendectomy. Open or laparoscopic? A prospective randomized study. Surg Endosc. 1998;12:1204–8.
6. Attwood, SEA, Hill ADK, Murphy PG, Thornton J, Stephens RB. A prospective randomised trial of laparoscopic versus open appendicectomy. Surgery 1992;112:497.
7. Kum CK, Ngoi SS, Goh PM, Tekant Y, Isaac JR. Randomized controlled trial comparing laparoscopic and open appendicectomy. Brit J Surg. 1993;80(12):1599-600.
8. McAnena OJ, Austin O, O'connell PR, Hederman WP, Gorey TF, Fitzpatrick JM. Laparoscopic versus open appendicectomy: a prospective evaluation. Brit J Surg. 1992;79(8):818-20.
9. Tate JJ, Chung SC, Dawson JW, Leong HT, Chan A, Lau WV, et al. Conventional versus laparoscopic surgery for acute appendicitis. Brit J Surg. 1993;80(6):761-4.
10. Tate JT, Chung SS, Li AC. Laparoscopic appendicectomy: a two-handed technique. Brit J Surg. 1993;80(6).
11. Javadi SM, Zarghami SY, Ghaderzadeh P, Ghorbanpoor M, Makarchian HR, Derakhshanfar A, et al. Comparison of small access and classic McBurney's incisions for open appendectomy: A randomized controlled trial. Shiraz E Medical J. 2017;18(10).
12. Malik AH, Wani RA, Saima BD, Wani MY. Small lateral access– an alternative approach to

appendicitis in paediatric patients: a randomised controlled trial. Int J Surg. 2007;5(4):234–8.
13. Sundaravadanan BS, Sudarshan PB. Mini incision appendectomy: an analysis of 70 cases. Int Surg J. 2017;4(3):896-8.
14. Ling L, Zenglin. Clinical application of two micro invasive operations to treat acute appendicitis Modern medicine and health. CNKI. 2009;15:21.
15. Sauerland S, Lefering R, Neugebauer E. Laparascopic versus open surgery for suspected appendicitis. Cochrane Collaborat. 2007;4:1-74.
16. Shah B, Vaidhya N, Anchalia MM. Comparative study between laparscopic appendicectomy and small incision open (mini lap) Appendicectomy in cases of acute appendicitis. Int J Sci Res. 2013;2(11):2319-64.
17. Bhasin SK, Dhar S. Mini-appendectomy (an Experience of 100 cases). JK Practioner. 2005;12(1):11-3.
18. Bhasin SK, Kumar V, Mahajan M, Kumar R. A comparitive study of mini-appendectomy & conventional-appendectomy in acute appendicitis. JK Sci. 2012;14(4):190.

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