APPENDICECTOMY;
LAPAROSCOPIC VS OPEN

ORIGINAL
PROF-1793

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ABSTRACT... Objective: The objective of this study was to compare length of hospital stay, pain scores and the rate of wound infections between laparoscopic and open appendectomy. **Design:** Randomized Controlled trial. **Place and Duration of study:** This study was conducted in surgical unit I Holy Family hospital, Rawalpindi from 1st June 2009 to 31st May 2010. **Patients and methods:** The patients were divided into open and laparoscopy groups and their age, sex, time of discharge, pain scores and wound infection rates were compared and analyzed. **Results:** Total of 160 patients were included in the study, 80 in each group. There were 58% male and 42% female patients. Mean age was 22.78 years (±6.2).Post operative pain scores were significantly less in the laparoscopic group ($p<0.05$). The length of hospital stay in open group was 35.10 hrs (±5.4) hours and in the laparoscopic group was 38.70(4.8) hrs with a p value of 0.592.Wound infection was 0.037% in open and 0.025% in the laparoscopic group. **Conclusions:** Laparoscopic appendectomy is superior in terms of less morbidity and shorter post operative hospital stay in the setting of an overworked tertiary care surgical floor of a Pakistani hospital.

Key words: Laproscopic appendicectomy, wound infection, post operative pain.

INTRODUCTION

Appendicitis is the most common intra abdominal pathology which requires emergency surgery for its treatment. It has a lifetime risk of 6%[1]. The overall mortality of open appendectomy is around 0.3%; and morbidity, about 11%[2]. Macburny in 1894 introduced the open surgical procedure (appendectomy) that has stood the test of time for around 100 years[3]. Semm a German gynaecologist performed the first laparoscopic appendectomy in 1981[4].

Two decades after the introduction of laparoscopic appendectomy the jury is still out on the effectiveness of this procedure as compared to the open approach. Multiple trials over the years have been done but a consensus about the advantages of one procedure overt the other has not developed yet[5,6,7]. This is in contrast to laparoscopic cholecystectomy, which has promptly become the gold standard for gallstone disease despite little scientific challenge[8].

The objective of this study was to compare length of hospital stay, pain scores and the rate of wound infections between laparoscopic and open appendectomy.

MATERIAL AND METHODS

This study was conducted in surgical unit 1 Holy family hospital, Rawalpindi from 1st June 2009 to 31st May 2010. This study was initiated after taking approval from the hospital's ethical committee. A total of 160 patients were randomly assigned into conventional appendectomy group and laparoscopic appendectomy group. Only the patients fulfilling the inclusion and exclusion criteria's were integrated in the study.

The Inclusion criteria were

1. Patients between the ages of 10 to 40 years, diagnosed as case of acute appendicitis on basis of clinical and laboratory investigations were included in the study.

The Exclusion criteria were

1. All the patients with previous history of abdominal surgery were excluded.
2. Patients diagnosed as case of perforated

Table-I. Comparison between Open and laparoscopic Appendectomy

	Open appendicectomy		Laparoscopic appendicectomy		
	Mean	SD	Mean	SD	P-value
Age	23.1	± 6.7	22.3	± 6.15	0.32
Pain scores	6.23	± 1.2	4.87	± 1.1	<0.05
Discharge time (hrs)	35.10	± 5.4	38.70	± 4.8	0.592
Wound infection	03	± 4.1	02	± 2.2	0.26

appendix or appendicular mass formation (clinically or sonographically).

3. Patients already diagnosed as case of abdominal Koch's were excluded from the study.

Open appendectomy (OA) was performed by standard grid iron incision and Laparoscopic appendectomy (LA) by 3 port technique. Post operatively the patients were followed for their pain scores, signs of infection and length of hospital stay. The patients were followed up for 8 weeks for any complications. From this data mean hospital stay, difference in pain scores and post operative complications were calculated to compare the difference between two groups.

RESULTS

During the study period of 1 year 160 patients fulfilling the inclusion and exclusion criteria were admitted from emergency with diagnosis of acute appendicitis. They were allocated to open and laparoscopic group by computer generated randomization method.

There were 58% male and 42% female patients. The mean age for patients undergoing appendectomy was 22.78 years (±6.2).

The range of post operative pain experienced by patients were 2-9 whereas mean was 5.55(±2.3). This pain score in open appendectomy was 6.23(±1.2) as compared to laparoscopic appendectomy in which score was 4.87 (±1.1) (p>0.05).

The mean hospital stay was 36.90(±8.4) hours and range was between 23 and 216 hours. Length of stay in case of OA was 35.10 hrs (±5.4) and in LA it was 38.70(4.8) hrs with a p value of 0.592.

Wound infection was the most notable post operative complication, only 3 patients (±4.1) in the open appendectomy group and 2(±2.2) patients in the laparoscopic group experienced wound infections with a p-value of 0.26.

DISCUSSION

The single greatest change in the surgical practice in last two decades has been the introduction of laparoscopic techniques in general surgery. New standards have been established for various indications. Patient comfort is a greater consideration in the 21st century. The acquisition of recent technology and skills now affords a better choice of the mode of surgery. Despite the worldwide application of laparoscopic surgery, people in our part of world still have doubts.

For years appendectomy has been done by conventional open technique. The percentage of normal appendices removed in different series varies from 8 to 33 %. Appendicitis is misdiagnosed in 33% of non pregnant women of child bearing age but now laparoscopic technique is being considered better in many aspects. Laparoscopic appendectomy (LA) has the advantages of precise operative diagnosis and fewer intra operative and post operative complications.

Open appendectomy (OA) has remained the gold standard for the treatment of acute appendicitis for more than a century. Unlike laparoscopic cholecystectomy, LA is not regarded as "Gold standard".

Recently laparoscopic surgery has gained wide

acceptance for many types of procedures, such as cholecystectomy because it offers the advantages of smaller wound, less pain and early return to normal activities. In 1981 Semm, a German gynaecologist performed the first LA. He described this technique in 1982 in a surgical conference. Since then various trials have shown that laparoscopic approach could be applied to most cases of appendicitis with high degree of success and low complication rate. Keeping in view the modern era of minimally invasive surgery and doubts regarding. Laparoscopic appendectomy we decided to study its efficacy in our local setup.

It is proved that laparoscopic procedures cause less post-operative pain than their conventional counterparts. The post-operative narcotic use is less after laparoscopic appendectomy. In our study post operative pain was significantly less in LA group as compared to OA group. This result is compatible with studies done by Basant Kumar and Abdul Samad in Hyderabad. In one study done by Ortega et al; linear analogue pain scores were recorded in 135 patients blinded to the procedure of operation by special dressing and pain score was very less in laparoscopic group compared to open. Another interesting observation has been the patient's perception of pain after appendectomy. Those who underwent laparoscopic appendectomy were more vocal of pain although it was of a lower intensity.

However, after 48 hours they had a better sense of wellbeing and showed earlier postoperative food intake and ambulation. This could have arisen from the expectation that laparoscopic procedures are painless or a lower level of endorphins released or the peritoneal injury from the pneumoperitoneum.

Length of hospital stay is presumed to be shorter after LA as compared to OA. Our results showed that there is no significant statistical difference regarding post operative hospital stay in either LA or OA. This is in accordance with the study carried out by R C Frazee. They conducted a prospective randomized trial comparing open with laparoscopic appendectomy the result of their post op hospital stay between the two groups remained insignificant.
R C Ignacio conducted a prospective randomized double blind trial to compare LA versus OA. According to them length of hospital stay was 21.5 hours and it was statistically insignificant when compared to the open group. Similarly many trials have shown the same finding. Ulrich et al in his study showed that LA was associated with shorter median hospital stay (LA 2.06 vs. OA 2.88 days, p value <.0001). Abdullah et al conducted a study in Canadian teaching centre to compare LA with OA. Post operative hospital stay in this study came out to be 1.3 days and 2.9 days for LA and OA respectively with significant p value (.0001).

The risk of wound infection is less in laparoscopic appendectomy compared to the open procedure. A meta-analysis of randomized controlled trials has been reported with outcomes of 2877 patients included in 28 trials. Overall complication rates were comparable, but wound infections were definitely reduced after laparoscopy (2.3% to 6.1%) [17]. Rohr et al reported higher wound infection rates after laparoscopic appendectomy, but most of the literature supports the view that wound infection is less common after a laparoscopic procedure.

CONCLUSIONS

Laparoscopic Appendectomy may not be the gold standard yet but its effectiveness in terms of decreased post operative pain and lesser hospital stay makes it an appealing option. Furthermore it should be widely applied and studied in the female population to decrease the infertility rates that are observed in females after open appendectomy.

REFERENCES

1. Samelson SL, Reyes HM. **Management of perforated appendicitis in children-revisited.** Arch Surg. 1987; 122: 691-696.

2. Majeed AW, Troy G, Nicholl JP, et al. **Randomized, prospective, single-blind comparison of laparoscopic versus small-incision cholecystectomy.** Lancet. 1996;347:989–994

3. McBurney C. **The incision made in the abdominal wall in cases of appendicitis, with a description of a new method of operating.** Ann Surg. 1894; 20: 38.

4. Semm K. **Endoscopic appendectomy.** Endoscopy.

1983; 15: 59-64.

5. Long KH, Bannon MP, Zietlow SP, et al. **A prospective randomized comparison of laparoscopic appendectomy with open appendectomy: clinical and economic analyses.** Surgery. 2001; 129: 390-400.

6. Maxwell JG, Robinson CL, Maxwell TG, et al. **Deriving the indications for laparoscopic appendectomy from a comparison of the outcomes of laparoscopic and open appendectomy.** Am J Surg. 2001; 182: 687-692.

7. Peiser JG, Greenberg D. **Laparoscopic versus open appendectomy: results of a retrospective comparison in an Israeli hospital.** Isr Med Assoc J. 2002; 4: 91-94.

8. Majeed AW, Troy G, Nicholl JP, et al. **Randomized, prospective, single-blind comparison of laparoscopic versus small-incision cholecystectomy.** Lancet. 1996;347:989–994.

9. Deutch AA, Shani N, Reiss R. **Are some appendicectomies un necessary?** J.R.Coll.Surg.Edinb. 1983;28:35-40.

10. Izbicki JR, Knoefel WT, WilkerDK, et al. **Accurate diagnosis of acute appendicitis: a retrospective and prospective analysis of 686 patients.** Eur J Surg 1992;158:227-31.

11. Aslan A, Karaveli C, Elpek O. **Laparoscopic appendicectomy without clip or ligature. An experimental study.** Surg Endosc 2008;22:2084-87.

12. Semm K. **Endoscopic appendicectomy.** Endoscopy. 1983;15:59-64.

13. Kumar B, Samad A, Khanzada TW, Laghari MH, Shaikh AR. **Superiority of Laparoscopic appendectomy over Open appendectomy: The Hyderabad Experience.** Rawal Med J. 2008;33:165-168.

14. Ortega AE, Hunter JG, Peters JH, Swanstrom LL, Schirmer B. **A prospective randomized comparison of laparoscopic appendectomy with open appendectomy.** Am J Surg 1995; 169: 208-13.

15. Frazee RC, Roberts JW, Symmonds RE, Synder SK, Hendricks JC, Smith et al. **A prospective randomized trial comparing open vs laparoscopic appendectomy.** Ann Surg. 1994;219:725-731.

16. Ignacio RC, Burke R, Spencer D, Bissell C, Dorsainvil C, Lucha PA. **Laparoscopic vs open appendectomy. What is real difference? Results of a prospective randomized double-blinded trial.** Surg Endosc 2004;18:334-337.

17. Guller U, Hervey S, Purves H, Muhlbaier LH, Peterson ED, Eubanks S et al. **Laparoscopic vs Open appendectomy: Outcomes comparison based on a large administrative database.** Ann Surg.2004;239:43-52.

18. Ali A, Moser MAJ. **Recent experience with laparoscopic appendectomy in a Canadian teaching centre.** Can J Surg.2008;51:51-55.

19. Hansen JB, Smithers BM, Schache D, Wall DR, Miller BJ, Menzies BL. **Laparoscopic versus open appendectomy.** World J Surg.1996; 20:17-21.

20. Rohr S, Thiry C, de manzini N, Perrauid V, Meyer C. **Laparoscopic vs open appendectomy in men: a prospective randimized study.** Br J Surg 1994; 81(suppl):6-7.

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The important thing is not to stop questioning.

Albert Einstein