

To Study The Comparison Between Open Appendicectomy, Laparoscopic Appendicectomy and Lap Assisted Appendicectomy in Appendicitis Patients in Terms of Post Operative Results



Medical Science

KEYWORDS : Laparoscopic surgery, Open appendicectomy, LAA, LA

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ABSTRACT

Background: Laparoscopy has gained widespread acceptance and importance in today's era of surgery. A rigid endoscope is introduced through a metal sleeve into the peritoneal cavity, which has been previously inflated with carbon dioxide to produce a pneumo-peritoneum. The advantages and efficacy of laparoscopic cholecystectomy over open cholecystectomy have been well documented and today laparoscopic cholecystectomy has become the gold standard for the treatment of gall stone disease. **Objective:** To study the intraoperative variability of different factors in open appendicectomy, laparoscopic assisted appendicectomy & lap appendicectomy.

Methods: Prospective observational study. Detailed record of each patient's data was obtained from case papers. Written informed consent of procedures was checked from each patient for necessary surgical procedure appendicectomy

Results: There was a declining pattern of pain on the VAS Scale in all the three groups. Operative time calculated from giving incision to closure of wound. Thus, the mean operative time was the lowest for LAA and maximum for LA. Return of bowel sound was earlier in laparoscopic group as compared to Open appendectomy. This was thought due to minimal handling of gut & this difference is statistically significant. The mean post operative hospital stay was the minimum in patients undergoing LAA and maximum in the patients undergoing open appendectomy. The difference is significant. The average time taken by patients undergoing open appendectomy to resume routine daily activities was 12-17 days, whereas those undergoing LAA took 10-15 days for the same. Patients who underwent LA took 10-16 days to resume all daily activities. Thus, there was a significant difference between the open and the laparoscopy groups. However, the difference between the LAA and LA was not significant. The Average time for resumption of work in the open group was 12-17 days, whereas in the LAA group was 10-15 days. In the LA group it was around 10-16 days.

Conclusion: Laparoscopic appendicectomy, in general, is a good therapeutic and diagnostic procedure and is superior to open surgery in several aspects- shorter post operative stay, less pain, early tolerance of oral feed, early resumption work and better cosmesis.

INTRODUCTION-

The vermiform appendix is considered by the most a vestigial. Its importance in surgery is due only to its propensity for inflammation resulting in a clinical syndrome known as acute appendicitis. Acute appendicitis is the most common cause of an acute abdomen in young adults. Appendicectomy is the most frequently performed urgent abdominal operation. Laparoscopy has gained widespread acceptance and importance in today's era of surgery. A rigid endoscope is introduced through a metal sleeve into the peritoneal cavity, which has been previously inflated with carbon dioxide to produce a pneumo-peritoneum. The advantages and efficacy of laparoscopic cholecystectomy over open cholecystectomy have been well documented and today laparoscopic cholecystectomy has become the gold standard for the treatment of gall stone disease ¹.

However, for interval appendectomy, the opinion about laparoscopic or open is divided ². Since its initial description by Kurt Semm in 1983, laparoscopic appendectomy has struggled to prove its superiority over the open technique. Open appendectomy has withstood the test of time for more than a century since its introduction by Charles McBurney in 1889. The procedure is standardized among surgeons and, unlike cholecystectomy, open appendectomy is typically completed using a small right lower quadrant incision and postoperative recovery is usually uneventful.

Numerous prospective randomized studies, meta-analyses, and systematic critical reviews have been published on the topic of laparoscopic appendectomy ³. However, the heterogeneity of the measured variables and other weaknesses in the methodology have not allowed to draw definitive con-

clusions and generalizations. The results of the various trials conducted have not conclusively proved the superiority of one procedure over the other. However, several studies have shown the benefits of laparoscopic appendectomy over open surgery in terms of less post operative morbidity, less pain, less rates of wound infection, less post operative hospital stay, early resumption of activity and work, better cosmesis, and also as an investigational tool for diagnosis of other abdominal pathologies ⁴. On the other hand laparoscopic appendectomy has been criticized for longer operative time and higher hospital costs as compared to open surgery ⁶.

Laparoscopic appendectomy can be done in two ways- laparoscopy assisted and total laparoscopic. Total laparoscopic appendectomy demands higher surgical skill, introduction of three or more ports and a longer duration of surgery.

Whereas laparoscopy assisted appendectomy has been observed to have many advantages such as simplicity of the surgery, less operative time, introduction of only two or three ports and less post operative morbidity. It helps in the assessment of other abdominal pathologies. As the main task is accomplished extra-corporeally, it can be easily performed by surgeons in training as it demands fewer technical skills.

This study was undertaken to evaluate the safety and efficacy of various techniques of interval appendectomy – traditional or "open" technique and the two techniques of laparoscopic appendectomy – "laparoscopy assisted" appendectomy (LAA).

OBJECTIVE

To study various merits and demerits in open appendectomy and laparoscopic appendectomy and laparoscopic assisted appendectomy.

Comparison of the three groups i.e. OA, LA, LAA will be done in terms of operative time, post operative pain and discomfort, maintenance of I/v line, oral intake starting time, total hospital stay and other post operative complication observed.

MATERIALS AND METHODS

Place of study- Swami Ramanand Tirth Rural Govt. Medical College¹, Ambajogai, India

DURATION

One year – (Jan 20015 to Jan2016).

DESIGN

Prospective, open labeled, comparative, three armed study.

INCLUSION CRITERIA

- All patients undergoing interval appendectomy with
- Past history of acute appendicitis
- Chronic right iliac fossa pain
- Chronic abdominal pain
- Patient ready to give written inform consent for the procedure.

EXCLUSION CRITERIA

When imaging techniques such as ultrasound, imaging studies and CT scan (in some cases) revealed some non-appendicular pathology, the patients were excluded.

All patients unfit for pneumoperitoneum / laparoscopy were excluded. This mainly included patients with cardiac diseases (myocardial infarction, ischemic heart disease, etc), respiratory diseases (bronchial asthma, COPD, etc), renal or hepatic disorders, bleeding disorders, etc.

Patients' not willing or not giving consent for the surgery.

OPERATIVE TECHNIQUES:

1) Open appendectomy: A Mcburney's incision is taken (oblique incision perpendicular to the spino-umbilical line passing through the Mcburney's point which lies at the junction of the median two-third and lateral one-third of the spino-umbilical line. The external oblique aponeurosis and the internal oblique muscle are split along the direction of their fibers. The peritoneum is opened and the appendix is traced. The appendix is delivered out through the incision. The mesoappendix is serially clamped, crushed, cut and ligated taking care that the appendicular artery is well secured. The appendix is amputated at its base and the stump is ligated. The mucosa of the stump is cauterized. The peritoneal cavity is irrigated. The wound is closed in layers.

2) Laparoscopy assisted appendectomy (LAA) : The patient is supine with both upper limbs besides the trunk. A urinary catheter is placed prior to obtaining pneumo-peritoneum. This is done to avoid injury to the urinary bladder while inserting the supra-pubic trocar. A spring loaded Verres' needle is inserted through an incision in the umbilicus and pneumoperitoneum is created . A 10 mm trocar is inserted through the umbilical port . Another 10 mm trocar is inserted through a suprapubic incision under vision . The camera is then introduced through the surapubic port. A quick and thorough examination of the peritoneal cavity is performed to look for any other pathology.

3) Laparoscopic appendectomy (LA) : In this procedure, after the creation of pneumo-peritoneum, three ports are inserted. Two ports, each of 10 mm through the umbilical and suprapubic position and the third port of 5 mm through the left lower quadrant. The camera is inserted through the suprapubic port. A quick and thorough examination of the abdomen is done to exclude any other pathology.

RESULTS:

Table no 1 : Post Operative Pain (VAS Score)

SN		Open	LA	LAA
1	VAS score at 0 min	6.85±0.99	6.05±0.89	6±0.92
2	VAS score at 6 hrs	5.3±0.86	4±0.73	3.85±0.75
3	VAS score at 12 hrs	4.65±1.09	2.9±0.72	2.6±0.68
4	VAS score at 24 hrs	3.07±0.80	1.84±0.69	1.44±0.51
5	VAS score at 48 hrs	3.07±0.80	1.33±0.49	1.33±0.52

There was a declining pattern of pain on the VAS Scale in all the three groups, But the VAS scores of patients undergoing open appendectomy were higher than that of patients undergoing laproscopic appendectomy at all times and the difference was statistically significant and also need for additional analgesic was more in the open group than in the laproscopic group. Between the laproscopic groups also, the VAS score in the LA group was higher than that of the LAA group at any given time. This was probably because maximum cases of LAA were done using two or three ports, whereas all cases of LA required three or more parts.

Table no 2: Operative Time (Minutes)

SN		Open	LA	LAA
1	Average time	50±17.32	58.25±15.58	41.25±9.58

Operative time calculated from giving incision to closure of wound. Thus, the mean operative time was the lowest for LAA and maximum for LA. The difference in the operative time of these three procedures was highly significant.

Table no 3: Return of Bowel Sound (hr)

SN		Open	LA	LAA
1	Return of bowel sound	34.2±8.05	22.2±10.5	21.8±8.60

Return of bowel sound was earlier in laparoscopic group as compared to Open appendectomy. This was thought due to minimal handling of gut & this difference is statistically significant.

Table no 4: Post Operative Hospital Stay (in Days)

SN		Open	LA	LAA
1	Hospital Stay	4.5±2.16	2.95±1.19	2.3±1.17

The mean post operative hospital stay was the minimum in patients undergoing LAA and maximum in the patients undergoing open appendectomy. The difference is significant.

Table no 5: Resumption of daily activities and work (in Days)

SN		Open	LA	LAA
1	Daily activities	14.25±1.74	12.65±1.54	12.05±1.54

The average time taken by patients undergoing open appendectomy to resume routine daily activities was 12-17 days, whereas those undergoing LAA took 10-15 days for

the same. Patients who underwent LA took 10-16 days to resume all daily activities. Thus, there was a significant difference between the open and the laparoscopy groups. However, the difference between the LAA and LA was not significant.

The Average time for resumption of work in the open group was 12-17 days, whereas in the LAA group was 10-15 days. In the LA group it was around 10-16 days. Thus, there was a highly significant difference between the open and the laparoscopy groups.

DISCUSSION:

Laparoscopic surgery has led to many changes in the management of surgical patients. This is mainly been possible due to minimal invasive nature of laparoscopic surgery. The age group of the patients varied from 9 to 60 yrs. Three groups were comparable in the age and sex. The mean age in open appendectomy group was 27.55, in LA it was 27.05 and in LAA it was 30.15. The cause of high incidence of appendicitis in the second and third decade of life is considered to be due to hyperplasia of lymphoid tissue in appendix which reaches its peak at 20 yrs of age and thereafter atrophy of lymphoid tissue begins as reported by P. Ronan and O' Connel⁵. The hyperplasia of lymphoid tissue and obstruction which causes appendicitis that may be the reason of low incidence of appendicitis in extreme of life.

The most common position of appendix was found to be retrocaecal in both the groups. 55% patients who underwent appendectomy had retrocaecal appendix and 26.7 of them had pelvic position of appendix. Duration of surgery varied between 30 min to 100 minutes in open appendectomy group. LA was 30 to 80 min with mean value 58.25 and LAA was 30 to 70 min with mean value 41.25. This difference is significant. Many workers have pointed out in the past that operating time in higher in LA as compared to Open appendectomy and LAA. Mean operating time calculated by Valious et al was 19 min using appendix exteriorization technique. Abdul Rauf and Abdulrahman Al-Bassam⁶ did 2-port LAA on 45 patients and 3-port LA on 41 patients and conclude that 2-port LAA was quicker to perform. Pappalepore N et al performed appendectomy on 8 patients by exteriorizing the appendix through umbilical port.

Return of bowel sound was earlier in LA and LAA (21 and 22.2 hr) as compared to open appendectomy group i.e. 32 hr, this is agreement with the comparative study conducted by j.j tate et al⁷, who reported the bowel transit restarted rapidly and spontaneously in LA group. The reason for earlier return of bowel activity may be due to minimal handling of the gut. The post operative morbidity in terms of nausea, vomiting was significantly lower in the laparoscopy group and hence the tolerance to oral feed was also better in the same group. In this study, it was observed that 8 patients were having nausea and 3 were having vomiting in open appendectomy group, 5 patients were having nausea and 2 were having vomiting in LA group, 3 patients were having nausea and 1 was having vomiting in LAA group.

The post-operative pain following laproscopic surgery was lower than that for open surgery at any given time. This difference was of statistical significance. There was declining pattern of pain on VAS score in all the three groups. Al-Bassam et al⁶ found that post-operative analgesia requirement was less in LAA as compared with LA.

The post operative hospital stay of the patients of the laparoscopy group was also significantly lower than that of the open group. Valioulis I recorded mean hospital stay of 2.8 days in his 29 cases of LAA. It is seen that results of present study are comparable with that of earlier studies. It was observed that LAA resulted in lower post operative stay as compared with LA. As in appendectomy, incision was bigger patients suffered more pain as compared to laparoscopic group. It was also found that resumption of daily activities and work was earlier in the laparoscopic group than the open group. (12 and 18 days for open appendectomy against 10 and 15 days respectively for laparoscopic group, p<0.05) .These finding are comparable to the findings of Pederson, Peterson and wara et al⁸.

The incidence of wound infection was higher after open surgery (3 cases) than laproscopic surgery and in LAA (2 cases) It was slightly higher than LA (1 case) because of port site infection .

The critics of laparoscopic appendectomy have pointed out to longer operative time and hence higher consumption of resources leading to higher cost of treatment. As observed in this study, LAA in fact could be performed more quickly than the OA. This was probably because laproscopic approach revealed appendix more easily so that it could be delivered out quickly to complete the procedure extracorporeally and perhaps time was also saved while closing the wound as compared to OA.

CONCLUSION: : Laparoscopic appendectomy, in general, is a good therapeutic and diagnostic procedure and is superior to open surgery in several aspects- shorter post operative stay, less pain, early tolerance of oral feed, early resumption work and better cosmesis. LAA in particular, also has advantage of shorter operative time. Being technically less demanding, LAA can be learnt easily and can be safely performed by surgeons in training.

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