Comparison of Two-Port Verses Three-Port Laparoscopic Appendicectomy in CCM Medical and Hospital

Dr. Ajay Khanolkar\textsuperscript{1}, Dr. Manish Khare\textsuperscript{2}
\textsuperscript{1}Associate Professor, \textsuperscript{2}Assistant Professor
Department of Surgery CCM Medical College Kachandur Durg CG

Address for Correspondence
Dr. Manish Khare
Assistant Professor Department of Surgery
Chandulal Chandrakar Memorial Medical College, Kachandur, Durg

Abstract
One of the most common cause of acute abdomen is acute appendicitis. A concept of "scarless" abdomen first described in 1998 by Esposito by Single Incision Laparoscopic Surgery was and has gained popularity. Still appendectomy is performed by laparotomy in most of the countries, causes may be the cost of the instruments or availability and affordability by the patients. Laparoscopic appendectomies are gaining popularity because of decreased pain, fewer postoperative complications, earlier mobilization, shorter hospitalization, earlier return to work, and better cosmesis. The aim of the study is to compare operative time, intra and post-operative complications, hospital stay after surgery in patients with two-port laparoscopic appendicectomy with the conventional three-port laparoscopic appendicectomy and to describe this technique for performing laparoscopic appendectomy with three portals at very low cost and with good aesthetic appearance and to compare the results with the conventional three-port laparoscopic appendicectomy. Material and Methods: Patients over the age of 18 with a diagnosis of acute abdomen, later on confirmed to acute appendicitis were included in the study. Out of 50 patients with laparoscopic appendectomy, 23 for two port appendicectomy and 27 three port were included in the study, Hasson’s technique was adopted for laparoscopic access into the abdomen. 10-mm umbilical port and 5-mm port was inserted with a grasper. Through the umbilical working trocar mesoappendix transected base of the appendix was ligated and the appendix was resected. Results: 23 cases performed using the two-port technique and 27 cases were performed using conventional 3 port technique. Operative time in two port appendicectomy (n=23) was 58±3.6 while in Conventional 3 port appendicectomy (n = 27) it was 52±2.4. Hospital stay for patients with two port appendicectomy was shorter and statistically significant. Conclusion: Two port appendicectomy is a safe and cost effective procedure and no major complications were found in this procedure.

Introduction
Medicine is an ever-growing field where day after day and year after year new things are invented and added and are applied for the treatment of numerous diseases. Surgery is one of the most feared treatment option so surgeon should provide the patients with the best possible surgical treatment options with minimal invasive procedure, lesser complications, less stay and pain.

One of the most common cause of acute abdomen is acute appendicitis. The cause of acute appendicitis is still unknown but is probably multifactorial may be luminal obstruction and dietary and familial factors have all been suggested.\textsuperscript{11} Appendectomy is one of the most commonly performed surgical procedures for acute appendicitis. Dr. Charles McBurney performed the surgical technique of first open appendectomy.\textsuperscript{17}

One of the greatest achievements in the history of surgery has been evolved from open surgical procedures to the operative video-laparoscopy. DeKok in 1977 performed the first laparoscopic appendectomy\textsuperscript{10} while Dr. Kurt Semm, in 1983, performed the first minimally invasive laparoscopic appendectomy; thereafter laparoscopic appendectomy has become popular in uncomplicated appendectomies in most minimally invasive institution and private hospitals.\textsuperscript{14} A concept of "scar-less" abdomen first described in 1998 by Esposito by Single Incision Laparoscopic Surgery was and has gained popularity.\textsuperscript{10} While first Single Incision Laparoscopic Surgery for acute appendicitis was performed by the Pelosi in 1992.\textsuperscript{11}
Although dating more than three decades after the first laparoscopic appendectomy, still appendectomy is performed by laparotomy in most of the countries, causes may be the cost of the instruments or availability and affordability by the patients. But over the past decade, the laparoscopic appendectomies are gaining popularity because of decreased pain, fewer postoperative complications, earlier mobilization, shorter hospitalization, earlier return to work, and better cosmesis.[7,8] But efforts are still being made to decrease abdominal incision and visible scars after laparoscopy for this researchers has developed the natural orifice transluminal endoscopic surgery (NOTES), but there are various drawbacks like opening of hollow viscera, failed sutures, a lack of fully developed instrumentation which need to be overcome for use of this surgery in the routine practice.[9,10]

The major advantages of laparoscopic appendectomy are less post-operative pain, minimal blood loss, lesser incidence of surgical site infection and shorter hospital stay. EAES (European Association of Endoscopic Surgery) guidelines suggest that laparoscopic appendectomy has a small but definite advantage over open appendectomy.[11] Laparoscopic appendectomy is considered to be a safe with only drawback of a slightly higher rate of intraabdominal abscess.[12]

The aim of the study is to compare operative time, intra and postoperative complications, hospital stay after surgery in patients with two-port laparoscopic appendectomy with the conventional three-port laparoscopic appendectomy (CLA).

The objective of this study of two-port laparoscopic appendectomy (TPA) is to describe this technique for performing laparoscopic appendectomy with three portals at very low cost and with good aesthetic appearance and to compare the results with the conventional three-port laparoscopic appendectomy (CLA).

Materials and Methods

This prospective study was carried out in Dept. of Surgery at Chandulal Chandrakar Memorial Medical College and Hospital Kachandur, Durg. Patients over the age of 18 with a diagnosis of acute abdomen, later on confirmed to acute appendicitis based on clinical findings, imaging and laboratory tests were included in the study. Patients with shock on admission, suspected perforated appendicitis, peritonitis, periappendiceal abscess, cirrhosis, coagulation disorders, pregnancy suffering from major diseases were excluded from the study. Written informed consent was obtained from each of the patient. Outcome of the patient was assessed in the form of operative time, length of hospital stay and postoperative complications. Preoperatively, all patients were well hydrated and prophylactic antibiotics were given pre-operatively to cover the postoperative infection. It was also explained the possibility of conversion to open surgery from laparoscopic in case of emergency.

Total of 74 patients were operated from a period of Jan 2018 to May 2018 in hospital for acute appendicitis out of 50 patients with laparoscopic appendectomy, 23 for two port appendicectomy and 27 three port were included in the study. Statistical analysis was done by using SPSS (21.00 versions). A P value < 0.05 was considered to be statistically significant difference between the two groups.

TECHNIQUE

Before entering the operating room, the patient was asked to empty the bladder. Preoperative preparations were made as in the conventional technique. The surgeon and his assistant were standing left to the patient.

Hasson's technique was adopted for laparoscopic access in to the abdomen. Pneumoperitoneum was created through a 10-mm umbilical port and the insufflations pressure was maintained between 10 and 12 mmHg. At the suprapubic area below the pubic hairline the 5-mm port was inserted with a grasper for evaluation and mobilisation of the appendix. To the suprapubic port, the 5 mm camera was shifted, and the umbilical port was used as a working and retrieval port. Anatomical position of the appendix, signs of general peritonitis and any adhesions were evaluated. If any of the adverse finding was observed appendicectomy was performed by conventional laparoscopic technique and a 5-mm triangulated trocar was inserted.

Through the umbilical working trocar the appendicular artery was identified and controlled, the mesoappendix transected with ultrasonic shears, base of the appendix was ligated. Double ligation of the appendix base with 2.0 polypropylene sliding knots and obliteration of the appendicular artery using bipolar electrocautery was done.[13] The appendix was resected and delivered through the umbilical port.

Patients were evaluated on the 7th and 14th postoperative day for analysis of recovery, any surgical site infection, abscess formation, abdominal tenderness and aesthetic satisfaction.

Results:

26 appendectomies were performed using the two-port technique out of which 3 cases had to convert to three port conventional technique by placing the additional 5mm trocar. So total 23 cases performed using two-port technique and 27 cases were performed using conventional 3 port technique were included in the study. Two groups were compared with their demographic data.
which were visible aesthetic benefits and of more postoperative wound infection and the length of hospital stay, was reduced, and the mean number of days to return was significantly shorter. This difference was statistically significant (p<0.005).

In the present study no statistically significant difference was found between two groups based on demographic data like age, sex. Similar results were shown by Rammohan A et al in their study.17

The mean operative time in our study was 58±3.6 which was longer than earlier studies by Sato N et al. and Rammohan A et al.,17,18 may be due to introduction of the new technique and surgeons were not familiar with the technique and extra precaution was taken.

In a study by Chow A et al., who compared conventional laparoscopic appendectomy versus the single incision laparoscopic technique found that in the single incision laparoscopic technique surgical time was shorter and the hospital stay was much shorter 1.36 days.19 In our study mean hospital stay was 2.2 days which was longer as compared to other studies, may be due to the reason that most of the patients were from the rural population and were reluctant to go home on the same day.

In some studies surgeons have tried to reduce incisional morbidity and improve cosmetic outcomes in laparoscopic appendectomy by using fewer and smaller ports.18,20 In a study by Roberts KE an intracorporeal suture based single-port laparoscopic appendectomy (puppeteer technique) observed good clinical results.21

Trend towards single incision laparoscopic surgery is increasing now a day and can be easily converted to conventional laparoscopy in case of emergency by adding a few trocars, this conversion to conventional laparoscopy being called port "rescue".22 Single incision laparoscopic surgery is still evolving requiring special articulating and coaxial instruments which limits its use in the rural and tribal areas so the two-port laparoscopic appendectomy can be preferred.
Conclusion

To conclude two port appendicectomy is a safe and cost effective procedure also it is more acceptable due to its cosmetic reasons. No major complications were found in this procedure and can be converted to three port in emergency. But to draw definitive conclusion more studies are required with larger sample size for further evaluation.

References

Correlation of USG findings and Clinical presentation of Appendix in Appendicitis: A Hospital-Based Study

Ajaya Anantrao Khanolkar

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With Best Regards,

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