

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

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## 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 appendicectomy, 23 for two port appendicectomy and 27 three port were included in the study. Hasson's technique was adopted for laproscopic access in to 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.<sup>[1]</sup> Appendectomy is one of the most commonly performed surgical procedures for acute appendicitis. Dr.

Charles Mcburney performed the surgical technique of first open appendectomy.<sup>[2]</sup>

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<sup>[3]</sup> 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.<sup>[4]</sup> A concept of “scar-less” abdomen first described in 1998 by Esposito by Single Incision Laparoscopic Surgery was and has gained popularity.<sup>[5]</sup> While first Single Incision Laparoscopic Surgery for acute appendicitis was performed by the Pelosi in 1992.<sup>[6]</sup>

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.<sup>[7,8]</sup> 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.<sup>[9,10]</sup>

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.<sup>[11]</sup> Laparoscopic appendectomy is considered to be a safe with only drawback of a slightly higher rate of intra abdominal abscess.<sup>[12]</sup>

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 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, peri-appendiceal 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. Pre-operatively, all patients were well hydrated and prophylactic

antibiotics were given pre-operatively to cover the post-operative infection. It was also explained the possibility of conversion to open surgery from laproscopic in case of emergency.

Total of 74 patients were operated from a period of Jan2018 to May 2018 in hospital for acute appendicitis out of 50 patients with laparoscopic appendectomy, 23 for two port appendectomy 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 appendectomy 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.<sup>[13]</sup> 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 trocher. 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.

**Table 1: Patients demographic data**

	Two port appendicectomy (n=23)	Conventional 3 port appendicectomy (n = 27)	p value
Mean Age	38±8.6	39±10.3	Not significant
Male	12	14	Not significant
Female	11	13	Not significant

Mean age for the two-port technique was 38±8.6 while in conventional 3 port appendicectomy it was 39±10.3. Out of 23 cases operated for appendicectomy with two port technique 12 were male and 11 were females. While in

conventional 3 port appendicectomy male and female were 14 and 13 respectively. This difference was not statistically significant.

**Table 2: Comparison of procedure, hospital stay and return to work**

	Two port appendicectomy (n=23)	Conventional 3 port appendicectomy (n = 27)	P value
Duration of procedure in minutes	58±3.6	52±2.4	Not significant
Hospital stay in days	2.2±1.6	4.2±1.3	P<0.005
Back to work	10±2.6	10±4.6	Not significant

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. No statistically significant difference was observed between the operative time in two groups. Hospital stay for patients with two port appendicectomy was shorter and statistically significant (P<0.005) in two port appendicectomy cases. Most of the cases were discharged on the second day. Mean return to work in both the groups was not statistically significant and mean of around 10 days was required in both the groups to resume their duties.

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.<sup>[17]</sup>

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.,<sup>[17,18]</sup> may be due to introduction of the new technique and surgeons were not familiar with the technique and extra precaution was taken.

## Discussion

Herbert Fitz was the first to person to publish the need for early diagnosis and surgery for acute appendicitis.<sup>[14]</sup> Traditionally, open appendicectomy has been done through a muscle splitting incision over McBurney's point made perpendicular to a line joining the umbilicus and anterior superior iliac spine. Open procedures rate has fallen with the increased use of laparoscopic techniques. A systematic review found that laparoscopic appendicectomy reduces wound infections, postoperative pain, length of hospital stay, and time taken to return to work.<sup>[15]</sup> Laparoscopic appendicectomy reduced the number of wound infections and the length of hospital stay in children but no reduction in postoperative pain and time to mobilisation was seen.<sup>[15]</sup> In this context laparoscopic appendicectomy is becoming more popular and common. It is technically more demanding but requires specialist equipment and expertise of the operating surgeon. Also there is an added advantage of diagnosing any other abdominal pathology if present.

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.<sup>[19]</sup> 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 appendicectomy by using fewer and smaller ports.<sup>[18,20]</sup> In a study by Roberts KE an intracorporeal sling based single-port laparoscopic appendicectomy (puppeteer technique) observed good clinical results.<sup>[21]</sup>

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".<sup>[22]</sup> 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 used in training programs to meet the necessary skills

The introduction of the laparoscopic surgery for appendectomy by Kurt Semm,<sup>[16]</sup> has shown significant aesthetic benefits and almost performed with three incisions, which were visible on the exposed abdomen.

## Conclusion

To conclude two port appendectomy 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

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