



A Study on Single Incision Multiport Laparoscopic Appendicectomy (SIMPLA)

Authors

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Introduction

Appendectomy is one of the frequently performed procedures in general surgery. It is being performed by various techniques like open surgical, laparoscopic assisted, total laparoscopic multiport, single-incision laparoscopic and natural orifice transluminal endoscopic (NOTES) appendectomy^{[1][2][3]}. Open and multiport laparoscopic techniques are frequently performed and are already established modalities. Single incision laparoscopic surgery (SILS) is a further step towards lesser invasive surgical procedure and could become an alternative to multiport laparoscopic appendectomy. But, it requires certain exclusive instruments, and expertise, which ultimately increases the cost of the procedure, especially in developing countries^{[4], [5]}. The cost of SILS could be minimised by using conventional multiport instruments to devise a Single Incision Multiport Laparoscopic Appendicectomy (SIMPLA). The objective of this study is to evaluate the feasibility and safety of SILS appendectomy using conventional multiport laparoscopic instruments.

Materials and Methods

This prospective study was carried out in the General Surgery department of KEMPEGOWDA Institute of medical sciences over a period of 6 months from August 2019 to December 2019. In the present study, patients with acute appendicitis undergoing elective as well as emergency SIMPLA were included. All the surgeries were performed using conventional multiport laparoscopic instruments using a single incision technique. Patients were selected according to the following criteria.

Inclusion Criteria

Age = 12–60 years

Clinically and/or sonographically proven acute appendicitis

No co-morbid conditions (ASA grades I and II)

Exclusion Criteria

Pregnancy

Morbid obesity

Multiple previous abdominal surgeries

Uncontrolled medical conditions

Instrumentation

Endovision: single-chip camera, halogen light source, CO insufflator

10-mm 30 ° telescope

5-mm 0 ° telescope
 10-mm trocar—1
 5-mm trocar —1
 Atraumatic grasping forceps
 Babcock's forceps
 Bipolar diathermy forceps
 Needuloscopic instrument: epidural needle-based suture-loop grasper
 Scissors

Position: Patient was positioned supine on the operating table with patient's left arm tucked, in Trendelenburg's position. The placement of operating surgeon, assistants and video cart are similar to the conventional laparoscopic appendicectomy.

Establishing the Ports

Under general inhalational anesthesia, a 2.5-cm single, curved, supra-umbilical incision made.

Pneumoperitoneum was created by open technique using blunt 10-mm trocar.

Abdominal cavity was explored with 10-mm 30 ° telescope. Additional 5 mm port placed adjacent to the 10mm port. In cases where another port was required, two 5-mm trocars were placed by the side of the first 10 mm trocar, one right infero-lateral and one right supero-lateral (Mickey Mouse configuration), with the skin incision being single.

One additional needuloscopic instrument for assistance through RIF was placed through which the extracorporeal knot made out of Prolene 1-0

Procedure

Abdominal cavity was explored with 10-mm 30 ° telescope. After confirmation of the diagnosis, the position of appendix was identified. The appendix is grasped with a 5-mm atraumatic grasper and fed into the prolene knot passed through the needuloscopic instrument followed by which the knot was tightened and traction given to enable dissection. Further dissection carried out by the instruments passed through the 5mm port adjacent to the 10mm camera port. Mesoappendix was cauterized and incised with bipolar forceps. Appendix was dissected up to the base. Base was doubly ligated on the caecal side and singly ligated on specimen side with the endoloop and resected in between.

The 10-mm telescope was replaced by 5-mm 0 ° telescope. Specimen was removed through the 10-mm port. The 10-mm port site was sutured with non-absorbable suture. Skin was sutured with silk. The clinical, operative, and outcome data of all the cases were documented and analysed systematically.



Fig 1: Placement of multiple ports through single skin incision

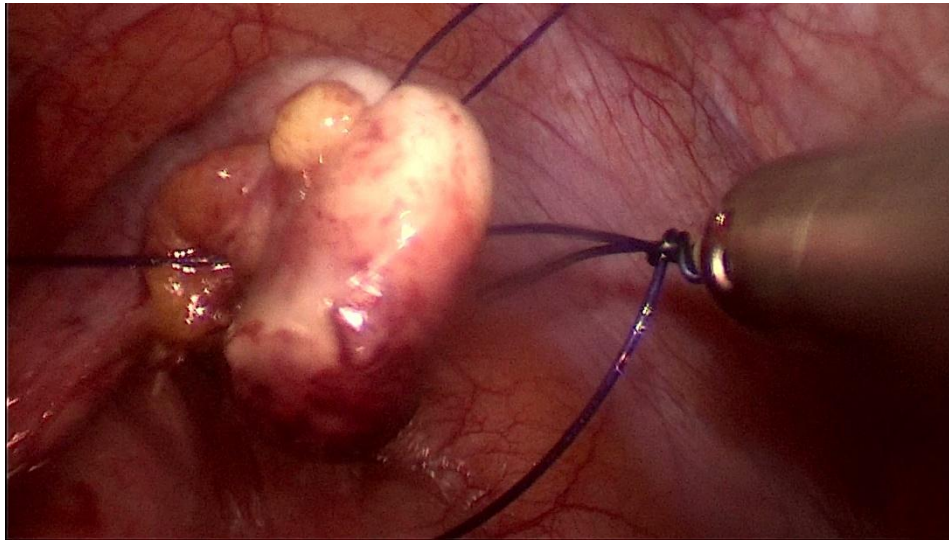


Fig 2: Appendix held in traction with help of prolene suture passed through the needlescopic instrument.

Postoperative Care

The patient is administered intravenous fluids, antibiotics, and analgesics. Oral feeds are commenced as appropriate depending on the

degree of appendiceal inflammation and return of bowel function. Early mobilisation is encouraged and the patient is usually discharged on the first post-operative day.

Results

Tables 1, 2 and 3 summarise our early experience with SIMPLA.

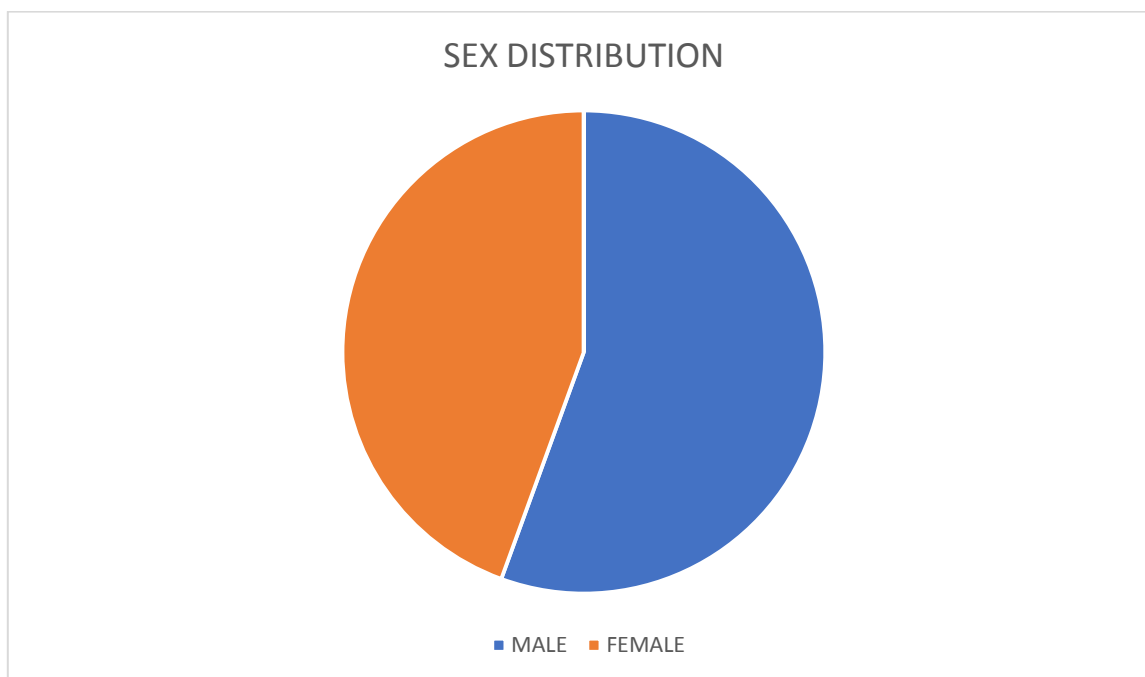
Table 1



Out of the ten patients who underwent SIMPLA, 7 patients had Acute appendicitis with ALVARADO score >7 and three patients had

acute appendicitis having ALVARADO SCORE <7.

Table 2



The average age was $23.4 \pm$ years, and there were 4 males and 6 females.

Followed by a single skin incision, three umbilical ports were placed in one case, with an additional right iliac fossa needloscopic instrument. The remaining 9 cases two umbilical ports and an additional right iliac fossa needloscopic instrument was used out of which one case

underwent conversion to a convention all aparoscopic approach due to difficult instrumentation.

The mean operative time was 57 ± 40 min, calculated from time of insertion of ports to skin closure. The average intraoperative blood loss was 7.5 ± 5 mL.

Table 3

| EVENTS | NUMBER OF PATIENTS | PERCENTAGE |
|------------------------|--------------------|------------|
| INTRAOP COMPLICATIONS | | |
| Bowel injury | 0 | |
| Vascular injury | 0 | |
| OPERATIVE TIME | | |
| 30-60 mins | 8 | 80% |
| 60-90 mins | 2 | 20% |
| CONVERSION | | |
| Multiport | 1 | 10% |
| Open | 0 | |
| POSTOP COMPLICATION | | |
| Paralytic ileus | 0 | |
| Peritonitis | 0 | |
| Intestinal obstruction | 0 | |
| Wound infection | 1 | 10% |

There was no incidence of increase intraoperative bleed or gut injury in SIMPLA technique. The time taken for bowel movement (passing stool) was 2.1 ± 0.6 days. Only the patient with the

perforated appendix required drain which was removed on the third post-operative day. Most patients⁽⁶⁾ were allowed orally on second post operative day and discharged on the third post-

operative day. Three patients were discharged on the second post-operative day, and the case with the appendicular perforation was discharged on the fourth post-operative day.

Discussion

Our experience demonstrates the safety, feasibility and superior cosmetic outcome of SIMPLA. It, however, presents a technical challenge to the operating surgeons due to difficult triangulation of instruments, hence time consuming in the beginning. However with experience and better learning curve, SIMPLA which can be performed using the conventional laparoscopic instruments, can gain increasing importance as it provides better cosmesis.

Conclusion

We propose that SIMPLA technique using conventional multiport instruments is simple, feasible, cost effective alternative to conventional laparoscopic appendectomy with superior cosmetic outcomes with no significant post operative complications.

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