Modified suture loop technique for single incision laparoscopic appendectomy (SILA); how I do with conventional instruments

M.S. Faisal, S.D. Muhammad

Sharif Medical and Dental College, Lahore, Pakistan

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Introduction to modified suture loop (Saad's Loop) technique for SILA

Single incision laparoscopic appendectomy (SILA) is a relatively new procedure for the treatment of acute appendicitis with the benefits of having no visible scar, as the procedure is done through a single incision which remains hidden within the umbilicus [1,2,3].

A simple and innovative suture loop (named Saad's loop) was devised by Dr. Muhammad Saad Faisal, Division of Surgery, Sharif Medical City Hospital, Lahore, Pakistan to make SILA low cost and feasible with conventional instruments. This loop serves to suspend the appendix intracorporeally.

Principle of the technique

1. The principle of SILA is completion of laparoscopic appendectomy via a single transumbilical incision.
2. Saad's loop hangs the appendix and mesoappendix, without passing through any of these structures - key step.
3. Saad's loop technique for SILA eliminates the need for a third port and roticulating instruments to suspend the appendix, making SILA less expensive and feasible with conventional instruments.

Surgical technique

Under general anesthesia, patients are kept in the Trendelenburg position with the left arm tucked on the patient's left side.

1. A 1.5 - 2cm long, crescent shaped skin incision is made along the left side of the umbilicus (Figure 1)
2. A Verres needle is used to generate a pneumoperitoneum. Two 10mm ports are introduced

in the linea alba, above and below the umbilicus through already made skin incisions (Figure 2), leaving a fascial bridge between the ports (Figure 3).

Figure 1. Crescent shaped skin incision around umbilicus

3. The laparoscope is introduced through one port, and the grasper through the second port.
4. A non-absorbable suture (polypropylene 2/0) on a straight needle is used to create Saad's loop by introducing it directly into the peritoneal cavity through the skin in the right iliac fossa, bringing the needle inside, holding it with the grasper and reinserting it back into the abdominal wall near the entry point of the needle without passing it through any intra-abdominal structures (Figure 4).

Figure 2. Two 10mm ports through umbilicus

Correspondence: M.S. Faisal
E-mail: saadi206@yahoo.com

Figure 3. Facial bridge between ports

Figure 4. Saad's loop hanging inside the peritoneal cavity

Figure 5. Two ends of Saad's loop are held separately by two haemostats, over the abdominal skin

5. The free ends are pulled externally after the appendix is engaged in Saad's loop and are clamped outside separately by two haemostats against the abdominal wall, instead of knotting (Figure 5).
6. In order to engage the appendix in Saad's loop, the grasper is first passed through this loop to grasp the appendix tip (Figure 6).
7. Then it pulls the appendix through this loop (Figure 7).

Figure 6. Grasping the appendix to engage it in Saad's loop

Figure 7. Suspension of appendix in Saad's loop

8. The assistant then holds both ends of the suture tight in haemostats.
9. The mesoappendix is controlled with Liga Clips, applied at its root and is separated from the appendix at the base with scissors or cautery.
10. The base of the appendix is recognized and ligated using extracorporeal knotting with absorbable sutures (Vicryl® 1). A metallic clip is applied opposite to the knot to avoid spillage from the distal end of the appendix while extraction of the specimen (Figure 8).
11. The appendix is then transected between the knot and the clip with laparoscopic scissors.
12. Saad's loop is pulled out to release the specimen

and it is then retrieved directly through the 10 mm port without using any special equipment (Figure 9).

13. The skin incision is closed with interrupted non-absorbable sutures (Polypropylene 3/0) (Figure 10).

Figure 8. Mesoappendix is clipped, knot and clip at base of appendix

Figure 9. Extraction of specimen

Figure 10. Skin incision is closed with interrupted sutures

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Discussion

With the help of the innovative Saad's loop, SILA can be easily performed in developing countries with the advantage of no additional cost to the patients.

The key manoeuvre is the suspension of the appendix within Saad's loop which is readjustable according to the surgeon's desire by simply manipulating and changing the position of the appendix using an ordinary laparoscopic grasper. This simple suture loop obviates the need for a third port, instrument or any special needle. The idea of the suture loop was borrowed from the single incision laparoscopic cholecystectomy where the suture is passed through the fundus of the gall bladder to hitch it against the abdominal wall for retraction [4,5].

The main advantages of the technique are cost effectiveness (only a 2/0 polypropylene suture is required) and feasibility with conventional instruments. It is also based on the principles of a laparoscopic appendectomy and this modified loop serves as a bridge between the conventional laparoscopic surgeries to the single incision laparoscopic surgeries. Previously, an epidural needle based percutaneous suture loop had been devised by Joshi et al to help dissection during conventional laparoscopic appendectomies. However, Saad's loop created with ordinary polypropylene 2/0 on a straight needle is less traumatic, fairly simple and cost effective. It also carries the potential of performing SILA [6].

The authors declare no conflict of interest and the study was conducted in accordance with the ethical standards of the institutional committee and the Helsinki Declaration of 1975, as revised in 2000.

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