Back to the Suture: The Two 5 mm Port Laparoscopic Appendectomy

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Back to the Suture: The Two 5 mm Port Laparoscopic Appendectomy

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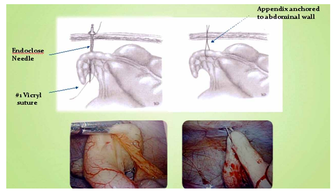
INTRODUCTION

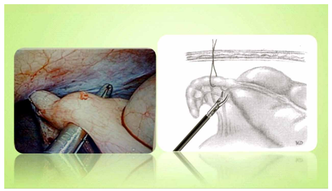
During this era, there has been a trend towards performing operations with less invasive techniques and in turn, less scars. Techniques representing this trend are transumbilical single-incision laparoscopic surgery (SILS) and natural orifice transluminal endoscopic surgery (NOTES). However, during this economic climate of decreasing re-imbursements and increasing costs, the price of single-port devices and associated instruments are prohibitive. In the western world, appendectomy is currently the most common abdominal operation performed on an emergency basis. What we describe is a procedure that has significant cost savings over both a standard laparoscopic appendectomy and a transumbilical single-incision laparoscopic appendectomy with the added benefit of improved cosmesis. This technique is a modification of the standard laparoscopic appendectomy that utilizes two 5 mm ports, a transabdominal sling suture for traction and manipulation of the appendix, and suture ligation of appendix and its mesentery.

OPERATIVE TECHNIQUE

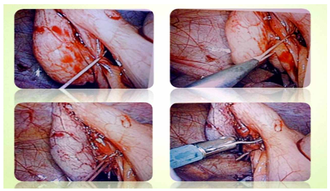
1. A 5-mm camera port is placed through the umbilicus; utilizing a 5-mm 30º camera
2. A second 5-mm port is placed in the left lower quadrant lateral to the rectus muscle; this port is used for a Maryland dissector/Davol grasper
3. An Endoclose device loaded with a 0 vicryl suture is placed transabdominally through the mesoappendix. The vicryl suture on the side of the mesoappendix distal to the abdominal wall is then held with a grasper and snared by the Endoclose device and brought back through the abdominal wall in a retrograde fashion to suspend the appendix from the abdominal wall (alternatively a nylon suture on a Kieth needle can be used). This is known as a transabdominal "sling" suture, where traction on the appendix may be adjusted using a Kelly clamp and varying the length of the "sling" suture.
4. A Maryland dissector placed through the 5-mm left lower quadrant port is then used to create a window through the mesoappendix at the base of the appendix.
5. A 0 vicryl suture is then placed through the mesenteric window at the base of the appendix. The mesoappendix is then ligated using extracorporeal knot tying with a knot pusher. This is then repeated for the proximal portion of the mesoappendix. The mesoappendix is then divided using endoscissors.
6. The base of the appendix is similarly ligated and divided.
7. The base of the appendix can be "dunked" using the endoclose device or alternatively cauterized with electrocautery.



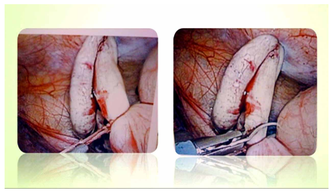
▲ **Fig 1.** Endoclose device with vicryl suture used to suspend the appendix from the abdominal wall



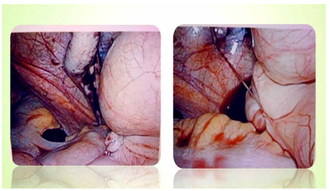
▲ **Fig 2.** Maryland dissector through 5 mm port used to create window through the mesoappendix at base of appendix



▲ **Fig 3.** Ligation and division of mesoappendix



▲ **Fig 4.** Ligation and division of base of appendix



▲ **Fig 5.** Utilizing the endoclose device to "dunk" the base of the appendix

STANDARD LAP APPY	SILS APPY	2 – 5 MM PORT LAP APPY
Two 5 mm port	SILS port	Two 5 mm port
One 12 mm port	One endoGIA stapler	Maryland dissector
One endoGIA staplers	One/Two reloads	Endoclose needle
One/Two reloads	Maryland dissector	Five vicryl suture
Endobag	Grasper	One monocryl suture
Maryland dissector		Knot pusher
Grasper		Endo scissors
Endoclose needle		Kelly clamp
One PDS suture		
One monocryl suture		
AVG COST: $1214	AVG COST:$921	AVG COST: $539

Laparoscopic appendectomy is $675 more expensive than 2-5 mm port laparoscopic appendectomy = 55.6% cost savings
SILS appendectomy is $382 more expensive than 2-5 m port laparoscopic appendectomy = 41.4% cost savings

▲ **Fig 6.** Concealed umbilical incision; left lower quadrant 5mm port site visualized

▲ **Fig 7.** 2 weeks post op

▲ **Fig 8. –** Two 5 mm ports, single incision

DISCUSSION

Contraindications ("recognize that not every case is amenable to this technique ")

- Abscess
- Diffuse peritonitis
- Plegmon
- Necrotic base
- Thick mesoappendix
- Retrocecal appendix
- Multiple previous abdominal surgeries
- Inexperienced surgeon

Potential Benefits

- Improved cosmesis
- Cost savings
- Decreased postoperative pain
- Decreased risk of hernia formation/bladder injury
- Advanced laparoscopic skills training

What's Next

- Two 5 mm ports in umbilicus
- Cheaper closure device

"Conversion to standard laparoscopic appendectomy/open appendectomy represents good surgical judgement and not a sign of failure."