

# *Laparoscopic Anterior Resection: Early Experience at Bhumibol Adulyadej Hospital*

**Poschong Suesat, MD**

Bhumibol Adulyadej Hospital, Directorate of Medical Service, Royal Thai Air Force, Bangkok, Thailand

---

## **Abstract**

Laparoscopic procedures are now rapidly replacing open conventional approaches in every branch of surgery. The advanced laparoscopic procedures in the gastrointestinal system are being practiced by laparoscopic surgeons. The advantages of laparoscopic colon resections were the better return of bowel function, less pain and hospital stay reduction. Many studies found no differences in recurrence and survival levels. The techniques of laparoscopic assisted, hand-assisted laparoscopic and totally laparoscopic anterior resections are briefly described. Four patients with sigmoid colonic cancer, 2 males and 2 females, age ranged from 52-90 years, underwent laparoscopic anterior resection: two laparoscopic assisted, one hand-assisted laparoscopic, and one totally laparoscopic colectomies. The operative times ranged 135-270 minutes. The postoperative hospital stays were between 6-12 days. No serious complications were detected.

**Key words:** Laparoscopic colectomy, anterior resection

---

## **INTRODUCTION**

Although awaiting the final reports from large randomized trial, with advancing learning curves and technology, the surgical technique was made easier leading to wide acceptance of laparoscopic colon resection. It requires advanced skill, thorough knowledge of gastrointestinal anatomy, and an ability to recognize structures from unusual angles and perspectives. It also requires the same principles of conventional procedures. The purpose of this report is to describe early experience with the techniques of laparoscopic assisted, hand-assisted laparoscopic and totally laparoscopic anterior resections.

## **MATERIALS AND METHODS**

Four patients, 2 females and 2 males with sigmoid colonic cancer, aged between 52-90 years, underwent laparoscopic anterior resection. Two laparoscopic assisted, one hand-assisted laparoscopic, and one totally laparoscopic colectomies were performed. Routine bowel preparation was employed and all patients received standard antibiotic prophylaxis. Anasogastric tube and urinary catheter were retained when the patient was anaesthetized. All procedures were performed with the patient in the lithotomy position. Full videoendoscopy facilities were used. Following instruments were required for routine laparoscopic

colonic surgery: endoscopic bowel grasping devices, an endoscopic scissor, a vessel sealing device and an endoscopic clip applier. Pneumoperitoneum was created using a standard technique and was maintained at 12-15 mmHg by an automatic carbondioxide insufflator.

For laparoscopic assisted and totally laparoscopic approaches, four ports were used: one subumbilical, one left lower abdominal and two right lower abdominal. An optional 12 mm port could be used to facilitate using an endoscopic stapling device for intracorporeal bowel division by replacing the 10 mm right lower abdominal port in totally laparoscopic approach. A 10 mm zero degree laparoscope was inserted through a subumbilical port and could be changed to another port for better visualization. The hand port using forearm balloon as described previously was an optional instrument for the hand-assisted approach.<sup>2</sup> The hand port site was an infra-umbilical vertical midline incision.

At initial laparoscopy, the lesion to be resected was identified, and both surfaces of the liver and the remainder of the abdominal cavity were inspected. Retraction of the left side of the colon was achieved by holding the bowel with the Babcock type bowel-grasping device or hand introduced through the hand port. Judicious tilting of the operating table could facilitate retraction of the colon and exposure of the paracolic gutter. The dissection was started by dividing the adhesions commonly seen between the sigmoid colon and the abdominal wall along the white line. Either Babcock or hand was used to tent up the sigmoid mesocolon, and the peritoneum on the lateral side was opened. Care must be taken at this stage not to injure the gonadal vessels and the ureter. Mobilization of the bowel was continued proximally towards the splenic flexure. At this stage, attention was directed to the splenic flexure, and the ligaments suspending this structure were divided. This step was imperative

to avoid damaging the spleen and also to avoid excessive tension on the descending colon later in the procedure.

For mobilization of the splenic flexure, the bowel could be grasped at mid-transverse colon, and peritoneal attachments were divided. The mesenteric vessels were divided close to their origin. Once this was done, the remainder of the mesenteric arcade must also be divided in order to allow for adequate resection margins. Following mobilization of the bowel, the remainder of the operation may be completed conventionally in laparoscopic assisted and hand-assisted procedures. The mobilized section of the colon was then exteriorized through the incision at the left lower quadrant, which might have to be extended, or through the hand port in case of hand-assisted technique. The colon was then divided under direct vision and reanastomosed using sutures in a standard manner. Alternatively, the anastomosis may be performed with a stapling device in totally laparoscopic approach. This involves mobilizing the proximal segment of bowel and exteriorizing it through the left lower abdominal port incision. Adequate tumor resection was performed extracorporeally. A purse string suture was applied to the exteriorized segment of bowel. The anvil of the circular stapler was inserted into the proximal bowel and the purse string was tightened around the shaft of the anvil. The anvil and proximal bowel were then returned into the peritoneal cavity towards the pelvis and the pneumoperitoneum was re-established. After completion of rectal wash out process, the assistant surgeon placed stapling device through the anus and attached with the anvil intracorporeally. All mechanisms of stapling device were completed and gently removed from the rectum. A final inspection of the mesenteric defect and areas of dissection were carried out to look for any residual bleeding or leakage of intraluminal air. A suction drain was placed in the pelvic cavity.

**Table 1** Randomized trials investigating return of bowel function after laparoscopic colectomy

Authors	Year	No. of patients	Time to bowels open	Significantly shorter than open
Milsom	1998	54	3	Yes
Curet	2000	18	2.7	Yes
Lacy	2002	111	1.5	Yes
Hasegawa	2003	29	2	Yes

**Table 2** Randomized trials investigating reduction in pain after laparoscopic colectomy

Author	Year	No. of patients	Less pain	Significantly less pain than open
Stage	1997	15	Yes	Yes
Schwenk	1998	30	Yes	Yes
Milsom	1998	54	Yes	Yes
Weeks	2002	168	Yes	Yes
Hasegawa	2003	29	Yes	Yes
Nelson	2004	345	Yes	Yes

**Table 3** Randomized trials investigating reduction in hospital stay after laparoscopic colectomy

Author	Year	No. of patients	Length of stay	Significantly less than open
Stage	1997	15	5	Yes
Schwenk	1998	30	10.1	Yes
Milsom	1998	54	5.2	No
Curet	2000	18	5.2	Yes
Lacy	2002	111	5.6	Yes
Weeks	2002	168	7.1	Yes
Hasegawa	2003	29	5	Yes
Nelson	2004	345	5	Yes

**Table 4** Trials investigating recurrence and survival after laparoscopic colectomy

Author	Year	Study type	No. of patients	Recurrence (%)	Survival (year)	Survival %
Anderson	2002	P	100	16.1	5	75.7
Scheidbach	2002	P	206	11.6	5	80.9
Franklin	1996	Cc	165	12.2	5	89.7
Schwandner	1999	Cc	32	15.6	3	93
Hartley	2001	Cc	21	5	3	71
Lacy	2002	R	106	17	5	91
Nelson	2004	R	345	0.5	4.4	77

Cc: Case control; P: prospective; R: randomised

**Table 5** Cases report

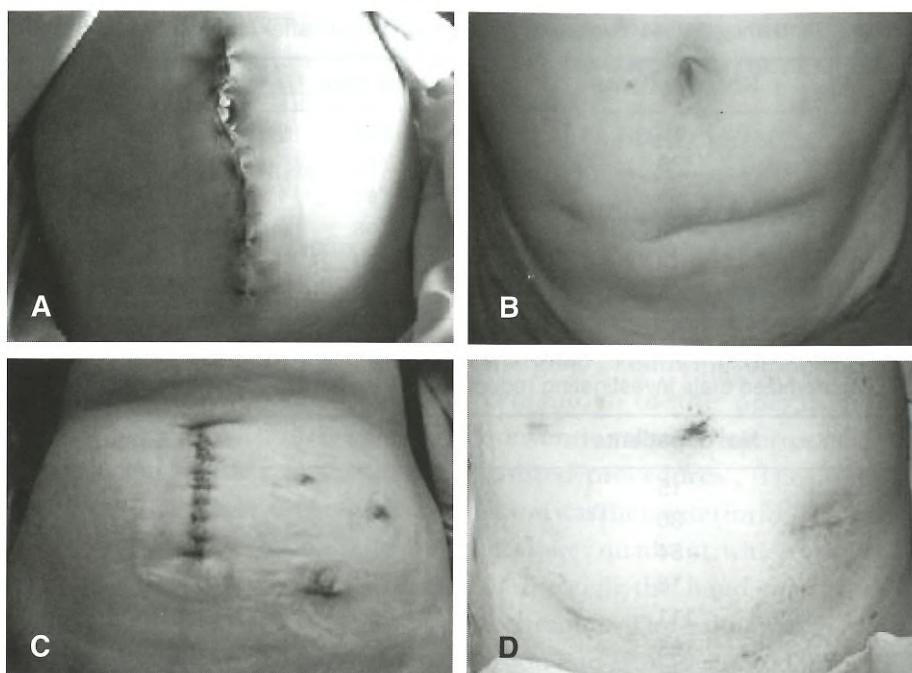
Sex	Age (years)	Procedures	Operative time (min)	Hospital Stay (days)
Female	77	Laparoscopic assisted anterior resection	270	10
Male	54	Laparoscopic assisted anterior resection	250	8
Female	52	Hand-assisted laparoscopic anterior resection	135	6
Male	90	Totally laparoscopic anterior resection	230	7

## RESULTS

The operative times ranged from 135-270 minutes. The postoperative hospital stays were 6-12 days. No serious complications were detected (Table 5). The surgical wounds were small as shown in Figure 1. Follow-up revealed satisfactory short-term results in all cases. The adjuvant therapy could be started early.

## DISCUSSION

Previous study reported that an accomplished laparoscopic surgeon would require performing at least 15 laparoscopic colectomies. An average surgeon would have to perform at least 25 hand-assisted cases and 50 totally laparoscopic cases. The mean operating time for competent surgeons would be 130 minutes.



**Figure 1** Surgical wounds of anterior resection procedures

- A Open procedure
- B Laparoscopic assisted procedure
- C Hand-assisted laparoscopic procedure
- D Totally laparoscopic procedure

Earlier series demonstrated learning curve effects with operative time up to a mean of 240 minutes.<sup>1</sup> The advantages of laparoscopic approach include the better return of bowel function, less pain and hospital stay reduction. Many studies found no differences in recurrence and survival levels (Tables 1-4). Laparoscopic colon resections are technically challenging surgical procedures.

As this is a preliminary report of very limited number of patients, no definitive conclusion could be made from this study. It is certainly at an early stage in the evolution of laparoscopic colon surgery at the author's institute, and it is important that experiences are being developed and reported in the time-honored

fashion, through peer-reviewed journals or at scientific meetings, and in consensus panels. Laparoscopic anterior resection is one of the challenging technique that every laparoscopic surgeons need to practice.

#### REFERENCE

1. Paraskeva PA, Darzi A. Laparoscopic surgery for colon cancer. *Surg Clin N Am* 2005; 85: 49-60.
2. Poschong Suesat, Advanced minimally invasive surgery video clips: the forearm balloon invention. *Thai Surgery Website* 2006. Available from URL <http://www.geocities.com/thaisurgery>