the lesion. With this method, large sessile tumors such as
30-40mm in diameter can be removed. When it is not
possible to remove the entire lesion in one piece, piece
meal EMR is performed.

**OBervation of the Surrounding Mucosa And the Fulguration of the Residual Lesion**

Particularly when a large sessile lesion is removed by the
method of EMR, it is important to know whether there is
any residual neoplastic tissue left behind. Meticulous
observation should be made with a help of magnifying
view if a magnifying colonoscope is available. When a
residue of a lesion is found, it is either re-snared of
destroyed by fulguration. The defect can be closed by
using large "clips", which is not always necessary.

**COmPlications**

Bleeding and perforation are the two major possible
complications. When bleeding occurs after snaring, clips
for hemostasis is usually used. This is the most effective
and safe way of having hemostasis. Injection of high
concentration NaCl with epihephrine or pure ethanol
injection has been reported to have a hemostatic effect
against bleeding after EMR. However, because of the
possible danger of perforation, we do not use such solutions
for hemostasis. When a perforation is suspected due to the
colonoscopic findings after EMR, closure of the defect by
large clips is often helpful to prevent overt perforation.
When a perforation is not possible to be closed with this
method, or when perforation became manifest after
colonoscopy, either conservative or surgical (open or
laparoscopic) approach should be made.

**Laparoscopic total mesorectal excision**

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**Positioning of Patient; Tro Car Sites**

In positioning the patient on the operating table it is important
that hip flexion should be kept to a minimum, or otherwise the
patient's thigh will be in the way of the chief surgeon's right
hand. Two ports (one 5mm, one 5-12mm) are created on the
right iliac fossa for use by the chief surgeon, whereas the assistant
surgeon operates via two 5mm ports on left iliac fossa. The
operation is carried out by using harmonic scalpel. Troublesome
bleeding is dealt with by means of a 5mm bipolar cautery forceps.
The whole procedure is conveniently described in 4 stages:

1. Mobilization of the Sigmoid Colon and Rectum

The chief surgeon and the assistant are operating via the first
monitor placed at the patient's foot end. This position avoids
unnecessary 'paradoxical movement' and potential 'mirror-images'
for both surgeons.

In the case of a female patient the uterus is first hitched up by
passing sutures underneath the two fallopian tubes and tying
them to the lower anterior abdominal wall.

The lateral peritoneal attachment of the sigmoid is first divided.
After the sigmoid colon has been mobilized, two mesenteric
windows are created at the sigmoid mesentery, one at the level
of rectosigmoid junction and the other at mid-sigmoid level. Two
cotton tapes are then tied around the bowel through the
windows. By grasping the lower cotton tape to and fro, the
assistant could provide the necessary counter-traction and exposure
for subsequent mesenteric division and rectal mobilization. The
retroperitoneum is incised medial to the left ureter, and the left
hypogastric nerve is cautiously identified. The presacral space
is then entered at a plane anterior to the left presacral hypogastric
nerve. The sigmoid colon is then swung to the left side, and the
peritoneum at the base of the sigmoid mesentery is incised. After

A 'window' at the base of the mesosigmoid has been established,
the division of the peritoneum could safely continue superiorly
just anterior to the aorta, until the origin of the inferior mesenteric
artery is encountered. The inferior mesenteric artery is divided
with staples at the aorta. Further superior dissection leads to the
inferior mesenteric vein, which is likewise divided. To ensure a
subsequent tension-free colo-anal anastomosis low down in the
pelvis, it is important that division of the inferior mesenteric
vessels should be as close to the aorta as possible (i.e. high
ligation).

Attention is now turned to the pelvis. The rectum is retracted
upward and forward, and the loose areolar plane between the
mesorectum and the presacral fascia (with the hypogastric nerves
lying on it) is identified. The right and left hypogastric nerves
should now be clearly visualized on the presacral fascia as two
structures going downward and diverging outward in the pelvis.
This presacral plane is dissected and followed as far as is
comfortable. The dissection then moves to the right and then to
the left of the rectum. Attention is then turned to the anterior
dissection. The rectum is pulled cephalad in order to expose the
rectovesical or rectouterine pouch. The anterior peritoneal
reflection is then incised. In the male, the plane is developed
between the anterior mesorectum and the seminal vesicles and
in the female between the anterior mesorectum and the upper
vagina. In the female a useful trick here is to have a second
assistant's finger in the vagina; by 'retracting' the vagina upward
from below, the rectovaginal plane could be easily established.
Following this, the lateral ligaments on either side of the rectum
are divided, and the whole rectum (and mesorectum within the
fascia propria) is mobilized down to the pelvic floor muscles. The length of the
mesorectal margin distal to the tumour could be conveniently

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assessed using a laparoscopic Debakey tissue forceps, the length of its distal metal portion is about 5cm. If the distance between the tumour and the pelvic floor is less than 5cm, then a total mesorectal excision is considered mandatory. At this stage it is helpful to have the second assistant pressing the patient’s perineum with his fist; this maneuver helps to bring the levator muscles into laparoscopic view. In our experience, the exposure of the pelvic floor muscles is the ‘end-point’ of the distal rectal mobilization, and by this stage the rectum should consist of a denuded muscle tube relatively free of mesorectum. An atrumatic forceps is then used to occlude the rectal lumen just below the tumour to allow distal cysticidal rectal washout from below after that the rectum is divided with endo-stapler just above the pelvic floor. To facilitate a transection low down at the pelvic floor and to avoid an oblique transection line, the assistant should retract the rectum cephalad; the operator then approaches and clamps the antimesenteric border is marked lightly with bipolar cautery at 2 different points to differentiate the proximal and distal limb, and a covering ileostomy is finally fashioned over the pre-marked stoma site.

REFERENCE

2. Mobilization of the Distal Transverse Colon and Splenic Flexure
The assistant now changes position and stands at the perineal side of the patient. The chief surgeon (still on right side) and the assistant are now operating via the second monitor placed on the patient’s left side. The patient is now put in a reverse-Trendelenburg position (while maintaining a right-side-down tilt) to bring the stomach and transverse colon into laparoscopic view.

An additional 5mm port is positioned over the epigastrium. The second surgeon continues to provide counter-traction using the left iliac fossa ports by holding the proximal cotton tape. The camera assistant could use the subumbilical or the right iliac fossa S-12mm port interchangeably, whereas the chief surgeon operates via the remaining ports. Starting from the mid-transverse colon, the greater omentum is gradually peeled off from the transverse mesocolon. The splenic flexure is then gradually taken down and mobilized off the Gerota’s fascia. Mobilization is considered adequate if: (1) the splenic flexure could be swung to the midline; and (2) the sigmoid-descending junction could go to the true pelvis without undue tension.

3. Exteriorization and Resection of the Specimen, and Creation of the Colonic J Pouch
An approximately 4-6cm gridiron incision is made in the left iliac fossa. The wound is protected with plastic bag, and the specimen is retrieved and excised. A 5-6cm long colonic J pouch was fashioned with a 80mm linear cutter using either the descending or the proximal sigmoid colon.

4. Intracorporeal anastomosis and Creation of Covering ileostomy
Intracorporeal pouch-anal anastomosis is performed with the circular stapler under laparoscopic view, extreme caution being exercised to avoid inadvertent stapling of the levator muscles or adjacent structures. In the female the second assistant could lift the vagina upward with a finger while he was closing the circular stapler; this maneuver helps to exlude the vaginal vault from the anvil. A point in the terminal ileum some 20cm from the ileocaecal valve is then identified for the formation of loop ileostomy. The antimesenteric border is marked tightly with bipolar cautery at 2 different points to differentiate the proximal and distal limb, and a covering ileostomy is finally fashioned over the pre-marked stoma site.

INTRODUCTION
Since the initial success of laparoscopic cholecystectomy in the late eighties, the laparoscopic approach to colorectal surgery has been attempted and feasibility has been shown in a variety of colorectal operations. Although totally feasible, there has been doubts on the actual benefits accrued to the recipients of this kind of surgery, the longer operating time required, degree of tumor clearance, excessive recurrence especially port site recurrence in its application to cancer cases, the higher cost of the operation and a significant learning curve involved. The development and popularization of laparoscopic approach to colorectal surgery has been slow when compared with its counterpart of cholecystectomy which is a relatively simpler procedure most general surgeons can acquire the skills adequately in a short time. However, in some centers where laparoscopic colorectomy has been developed intensively and large experience is accumulated, encouraging results that favored laparoscopic operations are produced.

One limitation of laparoscopic surgery in the past has been the inability of the operating surgeon to put his or her hand into the abdomen. This has put a lot of surgeons off the idea of laparoscopic surgery in colorectal surgery because they feel that the dexterity of the hand and the tactile sense that cannot be replaced with the instruments are important elements that are prerequisites for good surgery. Recently, the availability of the hand port has made it possible for surgeons to put their hands into the abdomen in laparoscopic surgery yet preserving the pneumoperitoneum. The hand assist technique in laparoscopic surgery has been tried with success in many solid organ removal operations such as splenectomy and nephrectomy. We have used the hand assist approach in colectomies since January 2000 in our center. We would like to report our experience in hand assist approach in laparoscopic colectomies with a background experience of over 500 cases of laparoscopic colorectal resections for colorectal cancer.

HAN D ASSIST AS A CONTINUATION OF INNOVATION
The psychomotor skills required for laparoscopic colorectal resection are very different from the conventional open operation. Although most of the steps involved in the procedures are the same as in the open version, laparoscopic operations involved a totally different set of instrumentation, limited degree of freedom in maneuvering and relearning of eye hand coordination. Another obstacle to adoption of laparoscopic surgery is the inability to use the hand inside the abdomen for its highly versatile motor skills and fine tactile sense. Because conventional open colorectal surgery is very much hand based which provide flexible retraction, displaying of structures, ability to perform safe blunt dissection and palpation of tumor margins and enlarged lymph nodes.

With the hand port technique, a device is anchored at the abdominal incision of about 7 cm. Coupled with the plastic sleeve over a gloved hand, either the right or the left hand of the surgeon can be inserted into the abdominal cavity without loss of pneumoperitoneum. The ability of putting in a hand for operation using the hand port technique has restored the possibility of hand manipulation under laparoscopic guidance and facilitated the whole laparoscopic procedure.

WHAT DIFFERENCE DOES IT MAKE USING HAND ASSIST TECHNIQUE
As an effective retractor
Because the hand can be opened or closed at great ease and is an effective and efficient fan retractor of organs especially small bowel which is very slippery, the hand assist technique is particularly useful in situations where small bowel easily gets into the way such as right, transverse and left colectomies. In sigmoid resection, anterior resection and abdominoaperineal resection, patient positioning is usually good enough to gravitate the small bowel away from the operative sites, the hand assist