

### Other Laparoscopic Gastrectomies for EGC

Laparoscopic distal, proximal, and total gastrectomies are performed according to the location of the tumor, as with open surgery. Laparoscopic proximal and total gastrectomies are indicated for EGC located at the upper stomach [49–53]. In both of these procedures, how to make reconstruction laparoscopically is a problem. Furthermore, to preserve the function of the gastric remnant after gastrectomy, a laparoscopic pylorus-preserving gastrectomy without injuring vagal nerves such as the pyloric or hepatic branch was tried [54].

### Advanced Gastric Cancer

D2 lymph node dissection in which the lymph nodes in the first (perigastric) and second (along the celiac artery and its branches) tiers are dissected is widely accepted in Japan for the treatment of advanced gastric cancer. A study of Japanese experience found that 30–40% of patients with metastasis in even second-tier lymph nodes who underwent D2 lymph node dissection have survived more than 5 years [55]. However, surgeons in the USA and other Western countries rarely perform extensive prophylactic lymphadenectomy, because two European randomized trials (RCT) showed no survival advantage of D2 over D1. Since these trials also compared D1 and D2 and showed high operative mortality in the latter – exceeding 10% – the British NHS Cancer Guidance officially discourages the use of D2 in clinical practice [56, 57].

According to the JSES survey, D1+ $\alpha$  lymph node dissection was performed in 67% and D2 lymph node dissection in 23% of LADGs for gastric cancer in Japan. Several investigators reported low mortality and morbidity in laparoscopic D2 lymph node dissection [58–60]. More recently, RCT by Huscher et al. [48] demonstrated the feasibility and safety of laparoscopic subtotal gastrectomy with D2 lymph node dissection for advanced gastric cancer. However, laparoscopic D2 lymph node dissection requires a learning curve, as does conventional open surgery. To establish the acceptability of laparoscopic gastrectomy with D2 lymph node dissection against advanced gastric cancers, safe techniques and new instruments must be developed.

### Future Aspects

To establish laparoscopic surgery as a standard treatment for gastric cancer, several issues must be resolved. The first is the prevalence of standard techniques, and the development of education and training systems is important. Recently, several training machines and animal training centers for getting better laparoscopic techniques have been developed. In addition, the JSES has started to design a Board Certification Examination for laparoscopic procedures. Thus, with the aim of popularizing laparoscopic surgery, education and training in standard laparoscopic techniques continue to develop.

The second issue is the evaluation of long-term outcome of laparoscopic gastrectomy for gastric cancer. Since laparoscopic gastrectomy for gastric cancer has been shown to be potentially superior in short-term outcome to open surgery, multicenter, large-scale randomized trials are required in order to establish laparoscopic gastrectomy not only for EGC but also for advanced gastric cancer.

Third, the oncological aspects of the influence of CO<sub>2</sub> pneumoperitoneum should be elucidated. So far, the effects of CO<sub>2</sub> pneumoperitoneum on cancer growth and progression, including lymph node metastasis and both hematogenous and peritoneal dissemination, have been reported in animal models [61–63]. CO<sub>2</sub> pneumoperitoneum in laparoscopic surgery has been reported to be inferior to laparotomy in open surgery regarding the activation of the spread of cancers except liver metastasis [64]. To better evaluate the oncological aspects of laparoscopic surgery, further examination of the effects of CO<sub>2</sub> pneumoperitoneum on cancer progression are needed.

Thus, laparoscopic surgeons have to design and implement education and training systems for standard laparoscopic procedures, evaluate clinical outcomes by multicentric RCT studies, and clarify the oncological aspects in basic studies. Laparoscopic surgeons expect that laparoscopic gastrectomy with minimal invasiveness will become a worldwide standard procedure for the treatment of gastric cancer.

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# 行われた治療としての 腹腔鏡下大腸癌手術

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## KEY WORDS

腹腔鏡下手術

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## はじめに

1991年, Jacobsら<sup>1)</sup>が世界ではじめて腹腔鏡下大腸切除術を報告して以来, 腹腔鏡下手術は従来の開腹手術と比べ低侵襲で整容性に優れており, 低侵襲治療としての位置づけを確立しながら, この10年余りで急速に普及してきた<sup>2)</sup>。一方, 早期癌から進行癌へその適応拡大がすすむにつれ, port site recurrenceなどの痛に対する腹腔鏡下手術の影響が懸念されるようになり, 1990年半ばより各国で開腹手術と腹腔鏡下手術のランダム化比較試験(RCT)が開始され始めた。本稿では, 大腸癌に対する開腹手術と腹腔鏡下手術との国内外で施行されているRCTに基づいたエビデンスを示すとともに, 標準治療としての腹腔鏡下手術の現時点での位置づけと今後の展望について概説する。

## I. 大腸癌に対する 腹腔鏡下手術の現況

### 1. 日本内視鏡外科学会アンケート調査結果

わが国における大腸癌に対する腹腔鏡下手術の現況は, 日本内視鏡外科学会の2年に1度行っている全国アンケート調査結果<sup>3)</sup>に基づくと, 2003年までに施行された腹腔鏡下手術の症例数は年々増加しており, 総手術症例数は17,200例を超え, 2003年の1年間では4,000例に及び, そのなかで進行癌の比率は55%を占めるに至っている(図1)。わが国のこのような普及の背景には, 2002年の腹腔鏡下手術の保険適応拡大が主要因の1つと考えられる。

### 2. 厚生労働省多施設共同班研究報告

わが国の大腸癌に対する腹腔鏡下手術の治療成績について, 平成13~16年度厚生労働省がん研究助成金「がんに

おける体腔鏡手術の適応拡大に関する研究(北野班)における多施設共同研究(retrospective multicenter study)のなかで報告されている<sup>4)5)</sup>。この班研究は、わが国の腹腔鏡下手術の先進的な17施設が参加し、1993年から2002年8月までの大腸癌に対する腹腔鏡下手術施行2,036症例を集計し、安全性と根治性を解析している。これによると登録症例の癌進行度の割合は、stage I ; 53%, stage II ; 16%, stage III ; 26%, stage IV ; 5%である。開腹移行(conversion)は、結腸癌の4.8%, 直腸癌の4.4%, 開腹移行理由は、適応を超えた癌の過進展が約半数、術中の出血や他臓器損傷が約3割という内訳である。結腸癌の治療成績では、術中合併症は1.4%, 術後合併症は12.6%の頻度、根治手術1,367例中61例(4.5%)に再発を認め、その形式は、肝が2.4%と最も多く、腹膜が0.4%, 肺が0.4%, リンパ節が0.3%, 局所が0.2%という内訳である。5年生存率は、stage I, II, IIIの順に、95%, 86%, 74%を示している(図2-1)。直腸癌では、術中合併症が3.6%, 術後合併症は14.1%の頻度で、根治手術476例中30例(6.3%)に再発を認め、その形式は、肝が2.7%と最も多く、肺0.6%, 腹膜1.1%, 局所0.8%, リンパ節0.7%という内訳であった。5年生存率は、stage I, II, IIIの順に、95%, 85%, 80%を示している(図2-2)。このRetrospective multicenter studyの報告から、わが国の結腸癌および直腸癌の治療成績は、合併症・再発率・再発形式・5年生存率のいずれも従来の開腹手術と比較してほぼ同等と考えられる。

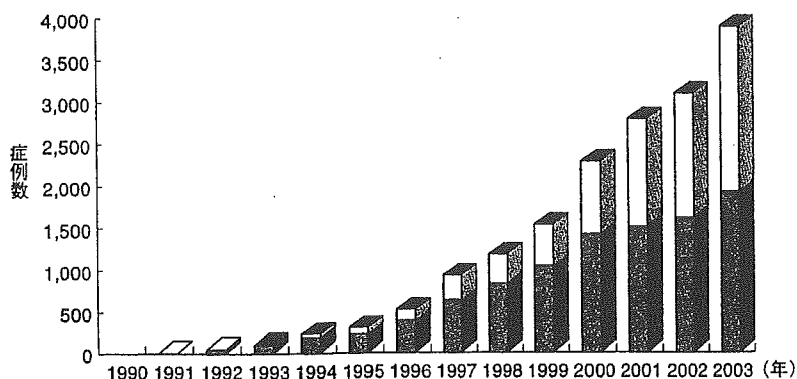


図1. 大腸癌に対する腹腔鏡下手術の動向  
(第7回日本内視鏡外科学会全国アンケート調査)  
■: 早期大腸癌, □: 進行大腸癌

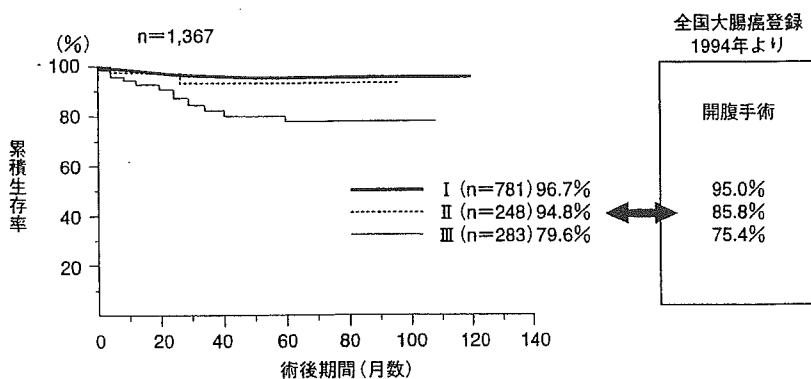


図2-1. 結腸癌に対する腹腔鏡下手術の遠隔成績(TNM staging別)  
追跡調査期間: 3~125ヵ月(中央値32ヵ月) (文献<sup>9)</sup>引用改変)

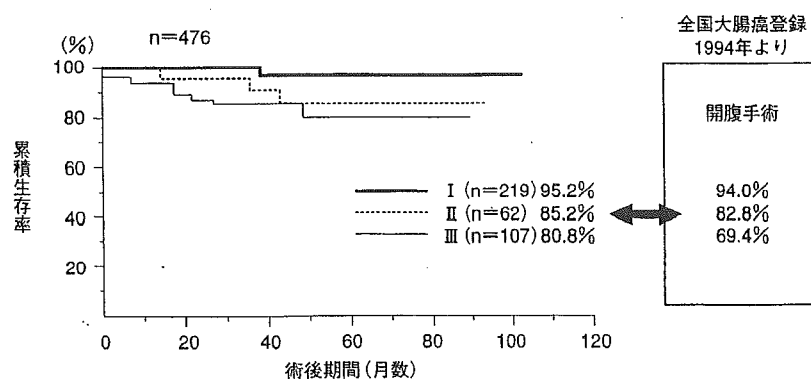


図2-2: 直腸癌に対する腹腔鏡下手術の遠隔成績(TNM staging別)  
追跡調査期間: 3~120ヵ月(中央値28ヵ月)  
(文献<sup>9)</sup>引用改変)

## II. 大腸癌に対する 腹腔鏡下手術のエビデンス

1990年代半ばより海外ですすめられている大腸癌に対する腹腔鏡下手術と

開腹手術のRCTを表1に示す。また現在まで長期成績が報告された3つのTrialの概要と結果を表2, 3にまとめた。2002年のスペインのLacyらの報告<sup>6)</sup>では、腹腔鏡下手術は再発率、

癌死亡率、全死亡率において独立した危険減少因子であり ( $p=0.04, 0.02, 0.006$ ), その差はstage IIIの開腹手術の治療成績不良によるものと考察されている。2004年の米国<sup>7)</sup>, 香港<sup>8)</sup>からの報告では、腹腔鏡下手術と開腹手術との間にどのstageにおいても再発率、全生存率に差は認めず同等との結果であった。しかし、これらのRCTは症例数が少なかったり、術後補助療法の規定がなかったり、あるいは開腹移行率や合併症発生率が高いなど、わが国の医療にそのまま受け入れることは妥当ではないと考えられる。

表1. 現在進行中の海外RCT(大腸癌に対する開腹手術vs腹腔鏡下手術)

国名	治験名	開始	Target accrual	
スペイン	— (Lacy AM)	1993	250	完了
香港	— (Leung)	1993	1000	完了
米国	COST (Nelson H)	1994	1200	完了
ドイツ	LAPKON (Bohm B)	1995	1200	
イギリス	CLASSIC (Guillou PJ)	1996	1000	
ヨーロッパ	COLOR (Hazebroek EJ)	1997	1200	
ニュージーランド	— (Bagshaw)	1998	1260	

表2. 長期成績が報告された海外RCTの試験概要  
(大腸癌に対する開腹手術vs腹腔鏡下手術)

著者	雑誌	症例	第一次エンドポイント	第二次エンドポイント
Lacy (スペイン)	Lancet (2002)	OC 101 LAC 105	癌関連生存率	全生存率 無再発生存率
Leung (香港)	Lancet (2004)	OC 200 LAC 203	全生存率 無再発生存率	—
COST (米国)	N Engl J Med (2004)	OC 428 LAC 435	再発までの期間	無再発生存率 全生存率 合併症 クオリティ・オブ・ライフ
JCOG (日本)		OC 409 LAC 409	全生存率	無再発生存率 合併症 術後早期経過 腹腔鏡下手術完遂率

OC: 開腹手術, LAC: 腹腔鏡下手術

## III. わが国における エビデンスの確立

前述の背景を受けてわが国でも、厚生労働省科学研究費補助金に基づき、Japan Clinical Oncology Group (JCOG)の臨床研究として、2004年10月より「進行大腸がんに対する腹腔鏡下手術と開腹手術との根治性に関するランダム化比較試験(JCOG 0404)」(研究代表者: 北野正剛)<sup>9)</sup>が開始されている。予定登録症例数は818例、登録期間は3年、追跡期間5年の非劣性試験である。腫瘍深達度はT3・T4(他臓器浸潤を除く)、主占拠部位は盲腸・上行結腸・

表3. 長期成績が報告された海外RCTの試験結果(大腸癌に対する開腹手術vs腹腔鏡下手術)

著者	開腹移行率	合併症率	周術期死亡率	全生存率	無再発生存率
Lacy (スペイン)	11%	$p=0.001$ (29% vs 11%)	$p=0.19$ (2.9% vs 0.9%)	HR 0.39 95% CI 0.19~0.82	$p=0.006$ (Stage III 症例)
Leung (香港)	23%	NS (24% vs 26%)	$p=0.97$ (0.6% vs 2.4%)	$p=0.61$ (73% vs 76%)	$p=0.45$ (78% vs 75%)
COST (米国)	21%	$p=0.64$ (20% vs 21%)	$p=0.40$ (1.0% vs 0.5%)	$p=0.51$ (85% vs 86%)	NS

S状結腸・直腸S状部の病変を対象とし、ランダム化割付因子は登録施設と腫瘍占拠部位(右側/左側)の2因子である。このRCTは海外で報告されたRCTの問題点をovercomeすべく以下のような特徴を有している。すなわち、①対象は早期癌を除外し進行癌に限定、②リンパ節郭清をD3と規定、③補助化学療法はstage III に対して5Fu/Lv静注療法と規定、④試験への参加施設および手術を施行する手術担当責任医の基準を設定、⑤全施行症例の手術写真を中央判定委員会にて審査、など臨床試験の高い質の確保を目指している。2005年11月現在、RCT開始後間もなく1年を迎えようとしているが、登録総数約200例の進捗状況である。

#### IV. 大腸癌に対する腹腔鏡下手術の位置づけ

本稿で示したわが国の多施設共同班研究と海外のRCT結果に基づくエビデンスから、現時点における腹腔鏡下手術の位置づけを結腸癌と直腸癌に分けて図3に示した。結腸癌に対しては、深達度T2までは腹腔鏡下手術が受け入れられており、T3/T4に関しては根治性に関する長期成績が十分に明らかにされていないため、わが国の大規模RCTの結果が期待される場所である。一方、直腸癌においては、現時点ではT1あるいはT2までが受け入れられつつあるが直腸の切離・吻合手技の安全性や側方郭清を踏まえた適応の問題点があり、現在、腹腔鏡下大腸切除研究

会(代表：渡邊昌彦教授)が中心となり直腸癌に対するphase II study, いわゆるFeasible studyが開始されることになるのである。

#### V. 標準化への取り組み

わが国の大腸癌に対する腹腔鏡下手術の標準化への取り組みとして、前述のRCTによるEBMの確立とともに技術面における標準化への努力も行われている。

##### 1. 腹腔鏡下大腸切除研究会の取り組み

1998年に発足した本会(設立者/代表：小西文雄教授)は、標準術式の確立、講習会の開催やトレーニング法の検討、データ集積による治療成績の分析など、大腸癌研究会のプロジェクト研究としてすすめられてきた<sup>10)</sup>。

##### 2. 内視鏡外科学会技術認定制度の発足

昨年度より、日本内視鏡外科学会において、安全な手術手技の普及を目的に、指導的立場にある内視鏡外科医を認定する制度が発足した。提出された無修正ビデオの手術手技に対して、共通項目と臓器別項目に分けて各領域ごとに厳正に審査が行われている<sup>11)</sup>。本制度の推進により、腹腔鏡下手術の普及と手術手技の標準化がさらにすすむものと考えられる。

#### おわりに

大腸癌に対する外科治療は、大きく変貌しようとしている。これは「患者にやさしい低侵襲治療」を望む社会のニーズとそれを実践させようとする腹腔鏡下手術の登場に帰するところが大きい。

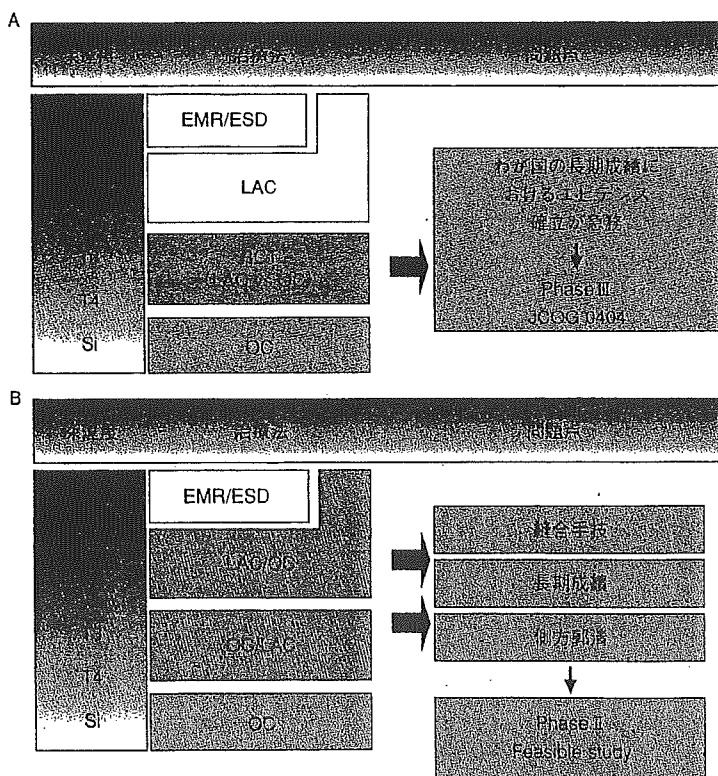


図3. 外科治療における腹腔鏡下手術の位置づけ  
A: 結腸癌, B: 直腸癌



現時点で腹腔鏡下手術は早期結腸癌において標準治療として受け入れられているが、進行結腸癌や直腸癌では、エビデンスの確立や安定した手技の点からまだ十分とはいえない状況である。今後は、わが国のRCTによるEBMの確立、講習会やアニマルラボによるトレーニングシステムの整備、学会レベルでの技術認定制度の取り組みが必要であり、さらに安全性、長期成績に加え医療経済も考慮した総合的な評価が腹腔鏡下手術の標準化に必要であろう。

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# Safety of Laparoscopic Intracorporeal Rectal Transection With Double-Stapling Technique Anastomosis

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**Abstract:** To assess the feasibility and analyze the short-term outcomes of laparoscopic intracorporeal rectal transection with double-stapling technique anastomosis, a review was performed of a prospective registry of 67 patients who underwent laparoscopic sigmoidectomy and anterior resection with intracorporeal rectal transection and double-stapling technique anastomosis between July 2001 and January 2004. Patients were divided into 3 groups: sigmoid colon/rectosigmoid carcinoma, upper rectal carcinoma, and middle/lower rectal carcinoma. A comparison was made of the short-term outcomes among the groups. The number of cartridges required in bowel transection was significantly increased in patients with middle/lower rectal carcinoma, and significant differences were observed in the length of the first stapler cartridge fired for rectal transection. Furthermore, mean operative time and blood loss were also significantly greater in the middle/lower rectum group; however, complication rates and postoperative course were similar among the 3 groups. No anastomotic leakage was observed. Laparoscopic intracorporeal rectal transection with double-stapling technique anastomosis can be performed safely without increased morbidity or mortality.

**Key Words:** laparoscopic low anterior resection, rectal transection, double-stapling technique, complication, colorectal carcinoma

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More than 10 years have passed since the first report of laparoscopic colectomy by Jacobs et al<sup>1</sup> in 1991. With regard to long-term oncological safety, which is the most important concern for laparoscopic surgery (LS) for malignancies, there have been no reports indicating that LS is inferior to conventional open surgery (OS).<sup>2-5</sup> On the other hand, because LS requires surgical techniques that are different from those of OS, even a surgeon with considerable experience in OS cannot readily perform LS.

In particular, LS for rectal carcinoma is very difficult surgery from a technical standpoint, and consequently many randomized, controlled trials have excluded patients with middle/lower rectal carcinoma. This is because of concerns

over the safety of the procedure, ie, the risk of complications associated with the laparoscopic procedure and the risk of tumor cell spillage because of traumatic manipulation of the tumor. Previous studies have reported an anastomotic leakage rate of 5.7% to 21% in patients who underwent laparoscopic low anterior resection (Lap-LAR), and some authors have recommended a covering ileostomy as a routine in Lap-LAR cases.<sup>6-12</sup> It remains uncertain which cases of rectal carcinoma are appropriate for laparoscopic surgery.

Since our first laparoscopic colectomy for colorectal carcinoma in 1993, approximately 280 laparoscopic resections for colorectal malignancies have been carried out at our institution. Most of our early experience was confined to early (Tis or T1) colorectal cancer located at the cecum, ascending colon, sigmoid colon, or rectosigmoid due to technical problems and concerns regarding port site and peritoneal recurrences. In June 2001, we unified our surgical and postoperative management procedures and expanded our indications for laparoscopic colectomy to include advanced colorectal cancers (ie, T2 lesions and beyond) located anywhere in the colon and/or rectum.

In 1980, Knight and Griffen<sup>13</sup> described the double-stapling technique (DST), which offered great advantages in that it permitted low rectal anastomoses to be performed with great ease. The aim of the present study was to assess the feasibility and analyze the short-term outcomes of laparoscopic intracorporeal rectal transection with DST anastomosis, one of the most demanding and stressful techniques in laparoscopic colorectal surgery, in selected patients with sigmoid colon and rectal carcinoma, who all underwent LS at our hospital after June 2001.

## PATIENTS AND METHODS

### Patients

At the Division of Colorectal Surgery of the National Cancer Center Hospital in Japan, 156 nonrandomized consecutive patients underwent laparoscopic colorectal resections between July 2001 and January 2004. During this period, 67 patients were treated by laparoscopic sigmoidectomy and anterior resection with DST anastomosis. Because the safety of LS in cancer patients remains to be established, candidates for laparoscopic surgery were patients who were preoperatively diagnosed with T1 or T2. Additionally, LS cases also included patients with sigmoid colon or upper rectal carcinoma who were preoperatively diagnosed with T3 but wished to undergo LS, as well as those for which palliative resection was

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considered necessary. Exclusion criteria for LS were tumors larger than 6 cm, a history of extensive adhesions, severe obesity (body mass index  $>32$  kg/m<sup>2</sup>), intestinal obstruction, and refusal to undergo LS. The preoperative workup consisted of a clinical investigation, barium enema, total colonoscopy, chest x-ray, abdominal ultrasonography, and computed tomography.

LS was contraindicated for patients with preoperative diagnoses of T3 and T4 tumors in the middle and lower rectum because, with the current instrumentation, it was difficult to perform laparoscopic procedures without grasping and manipulating the bowel or mesorectum near the tumor; our concern was that this would result in accidental tumor spillage. Furthermore, lateral lymph node dissection combined with total mesorectal excision remains the standard surgical procedure for patients with T3 and T4 lower rectal carcinoma in Japan, and lateral lymph node dissection by laparoscopy is still an unexplored frontier.<sup>14-16</sup> As a result, some patients were found to have T3 cancer only after histopathological examination of the surgical specimens. Preoperative or postoperative radiation therapy was not performed in this series because of the low local recurrence rate in patients with T1-T3 lower rectal carcinoma without preoperative radiation.<sup>14,16</sup>

Patients were divided into 3 groups: sigmoid colon/recto-sigmoid carcinoma, upper rectal carcinoma, and middle/lower rectal carcinoma. For the patients with rectal carcinoma, a primary rectal carcinoma was defined according to its distance from the anal verge as determined by colonoscopy. The tumors were grouped into lower rectum (0-7 cm), middle rectum (7.1-12 cm), and upper rectum (12.1-17 cm). We combined patients with middle and lower rectal carcinoma as a group because laparoscopic techniques for rectal transection and DST anastomosis were almost same: anastomosis located below peritoneal reflection.<sup>7</sup> Patients with lesions located within 2 cm of the dentate line who underwent laparoscopic intersphincteric rectal resection and hand-sewn coloanal anastomosis were excluded from the present study. This surgical technique has been described previously.<sup>17</sup> Conversion to open surgery was defined as any incision greater than 7 cm, excluding cases in which the incision was enlarged due to a large specimen size that could not be removed with a 7-cm incision.

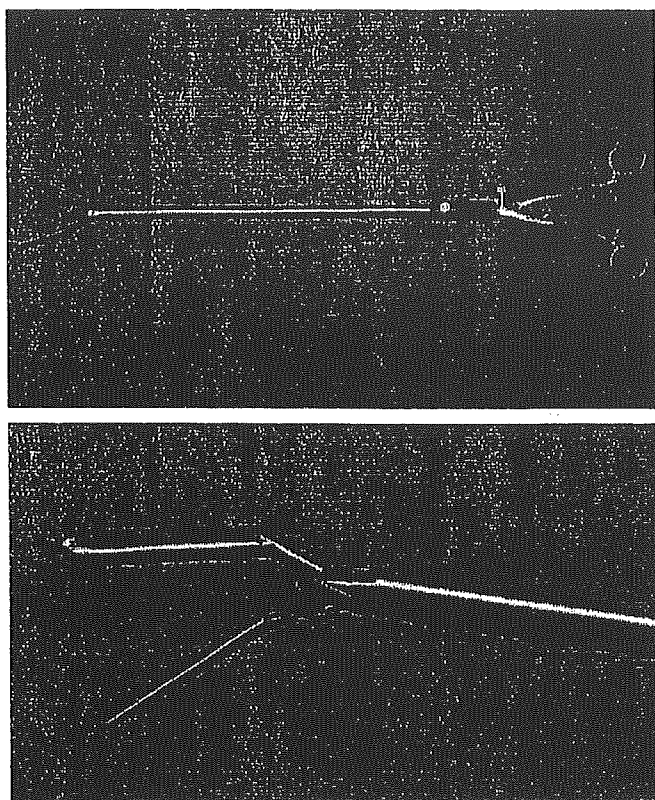
### Laparoscopic Technique

Laparoscopic resection techniques have previously been described, with minor modifications.<sup>7,17</sup> Initial port placement was performed using the open technique, and pneumoperitoneum was induced using carbon dioxide. Two 5-mm ports were then inserted in the left lower midabdominal and the left lower quadrant regions, and 2 other 12-mm ports were inserted in the mid-lower and the right midabdominal regions under laparoscopic guidance.

The left colon was initially mobilized laterally to medially until the left ureter and superior hypogastric nerve plexus were identified. The mobilization of splenic flexure was performed if necessary. Usually, Japanese patients have a long sigmoid colon, and if the surgeon preserves 1 or 2 arcades of marginal vessels of sigmoid colon by division of sigmoidal arteries between superior rectal artery and marginal vessels, mobilization of splenic flexure becomes unnecessary; thus,

splenic mobilization was performed in only about 20% of our patients. Then, a window was made between the mesocolon containing the arch of the inferior mesenteric vessels and the superior hypogastric nerve plexus, starting at the bifurcation, with support from an assistant holding the sigmoid mesocolon ventrally under traction and to the left using a 5-mm bowel grasper through the left lower quadrant port. After the dissection, proceeding to the origin of inferior mesenteric artery, taking care not to injure the superior hypogastric nerve plexus and the roots of the sympathetic nerves, intracorporeal high ligation of the inferior mesenteric artery was performed. After cutting the inferior mesenteric vein and left colic artery, mobilization of the rectum and mesorectum was performed. The avascular plane between the intact mesorectum anteriorly and the superior hypogastric nerve plexus, right and left hypogastric nerves, and Waldeyer fascia posteriorly was entered by sharp dissection and extended down to the level of the levator muscle for middle and lower rectal carcinomas, taking care to protect the pelvic nerves. For proximal sigmoid colon carcinoma, the mesentery at the promontory was excised routinely using ultrasonic shears (laparoscopic coagulating shears [LCS], Ethicon Endo-Surgery Inc, Cincinnati, OH) or an endolinear stapler (Endo GIA Universal, Tyco Healthcare, Auto Suture Co, US Surgical Corp, Norwalk, CT). For recto-sigmoidal and upper rectal lesions, mesorectal tissue extending down to 5 cm below the tumor was excised routinely using LCS. Middle and lower rectal tumors were treated by total mesorectal excision. Immediately before rectal transection, laparoscopic rectal clamping was performed just above the anticipated point of rectal transection, using a bowel clamping device (Fig. 1) introduced through the 12-mm mid-lower port. A distinct advantage of this device is that the bowel clamp at the head of the device can be easily bent intraabdominally without reducing the grasping strength. Rectal washout was performed routinely using 1000 mL of a 5% povidone-iodine solution. Rectal transection was then performed by a multiple-firing technique, using Endo GIA Universal staples, introduced through the 12-mm right midabdominal port.<sup>18</sup> If the rectal transection was not completed after the first cartridge, the stapler line for the second cartridge was carefully positioned on the anal side stapler line of the first cartridge. The third and fourth firings were performed in the same way. A 4- to 5-cm incision was then made over the mid-lower 12-mm port site, and the bowel was exteriorized under wound protection and divided with appropriate proximal clearance. After inserting the anvil head of the circular stapler into the end of the proximal colon, the proximal colon was internalized and the incision was closed. Intracorporeal anastomosis under a laparoscopic view was performed by means of the DST, using a circular stapler (ECS 29 or 33 mm, Ethicon Endo-Surgery Inc). After the insertion of the body of the circular stapler into the anus, the puncturing cone was pushed through the mid-point of the linear staple line. In patients in whom 2 or more linear stapler cartridges were used for rectal transection, the puncturing cone was pushed near the crossing point of the first and second stapler lines.

The anastomotic air leakage test was performed if the "doughnuts" were incomplete. Patients with a low anastomosis within 1 cm from the dentate line and incomplete doughnuts



**FIGURE 1.** Bowel clamping device. A distinct advantage of this device is that the bowel clamp at the head of the device can be easily bent intraabdominally without reducing the grasping strength.

underwent a covering ileostomy. However, the decision to perform a protective ileostomy in this series was based on much looser criteria than those used in OS to avoid major anastomosis complications that could lead to a permanent stoma or a fatal outcome, especially in the early LS cases of lower rectal carcinoma.

### Study Parameters

The parameters analyzed included gender, age, body mass index, prior abdominal surgery, operative time, operative blood loss, number of stapler cartridges fired and the length of the first stapler cartridge for rectal transection, conversion rate, days to resume diet, length of postoperative hospital stay, and both intraoperative and postoperative complications within 30 days of surgery. Pathologic staging was performed according to Duke's stage.

### Statistical Analysis

Statistical analysis was performed using the  $\chi^2$  test, Kruskal-Wallis test with Bonferroni correction, and repeated-measure analysis of variance (ANOVA) with the Scheffe method when appropriate. A *P* value of <0.05 was considered significant.

## RESULTS

The patient demographics are summarized in Table 1. No significant differences were observed in baseline characteristics among the 3 groups. In the middle/lower rectum group, anastomosis was performed <3 cm from the dentate line in 7 patients and >3 cm but below the peritoneal reflection in 3 patients. We performed an anastomotic air leakage test in 2 patients with lower rectal carcinoma and did not find any sign of air leakage; however, both patients underwent a protective ileostomy. Overall, a protective ileostomy was required in 4 patients, and a transverse coloplasty pouch was created in 1 patient.

The number of patients in relation to the number of stapler cartridges used for rectal transection in each group is shown in Table 2. The number of cartridges required during bowel transection was significantly increased in patients with middle/lower rectal carcinomas compared with the other groups. Similarly, significant differences were observed in the length of the first stapler cartridge fired for rectal transection (Table 3). In patients with middle/lower rectal carcinomas, the length of the first stapler cartridge was 45 or 30 mm, and it was 45 or 60 mm for proximal lesions.

Operative and postoperative results are shown in Table 4. Mean operative time and blood loss were significantly greater in the middle/lower rectum group. All the operations were completed laparoscopically. We did not experience any accidental intestinal perforations at or near the tumor site. Liquid and solid food was started at a median of 1 and 3 postoperative days in all groups. The median length of postoperative hospitalization was 8–9 days. No significant differences were observed in the postoperative course among the 3 groups. All patients were discharged home.

The postoperative complications are listed in Table 5. There were no perioperative mortality and no anastomotic leakage. Reoperation of a laparoscopic division of an adhesive band for a postoperative small bowel obstruction was necessary in 1 patient with sigmoid colon carcinoma. No significant differences were observed in complication rates among the 3 groups.

**TABLE 1.** Patient's Characteristics\*

	Sigmoid Colon/ Rectosigmoid	Upper Rectum	Middle/Lower Rectum
No. of patients	36	21	10
Sex ratio (male:female)	22:14	10:11	8:2
Age (y)	59 (30–79)	59 (37–73)	60 (47–76)
Body mass index (kg/m <sup>2</sup> )	23.5 (18.9–29.0)	24.1 (17.5–32.4)	23.8 (19.5–26.4)
Prior abdominal surgery (%)	6 (17)	5 (24)	5 (50)
Duke's stage			
A	27	16	7
B	1	0	0
C	7	3	3
D	1	2	0

\*Values are means (range), *P* > 0.05.

**TABLE 2.** Number of Patients in Relation to the Number of Stapler Cartridges Fired for Rectal Transection\*

No. of Stapler Cartridges Fired	Sigmoid Colon/Rectosigmoid†	Upper Rectum†	Middle/Lower Rectum
1	25	8	0
2	9	12	2
3	2	1	6
4	0	0	2

\**P* < 0.01 between groups, Kruskal-Wallis test.  
†*P* < 0.01 versus middle, lower rectum/Boneferroni test.

### DISCUSSION

In the present study, short-term outcomes were compared among different tumor sites in patients who underwent laparoscopic intracorporeal rectal transection with double-stapling technique anastomosis. The closer the tumor site was to the anus, the more the number of stapler cartridges needed for rectal transection increased and the use of a longer Endo GIA Universal stapler cartridge was significantly restricted, suggesting that rectal transection for Lap-LAR in patients with middle/lower rectal carcinomas may be a difficult and stressful procedure. In the present study, however, the complication rate did not increase despite lower anastomotic sites. With thorough and careful intracorporeal rectal transection and DST anastomosis, the safety of Lap-LAR may be established.

Minimum invasiveness is often noted as one of the merits of LS in comparison with OS for colorectal cancer.<sup>19-23</sup> But even recently, some studies have reported that minimal or no short-term benefits were found with LS compared with standard OS.<sup>24-26</sup> Reviewing these reports raises a question about the conversion rate. Even granting that LS has a lower surgical invasiveness than OS, there is a possibility that the treatment outcomes of LS will be contaminated by the treatment outcomes of OS, when the conversion cases are included in the LS group, based on the intention-to-treat principle. In the study by Weeks et al,<sup>26</sup> who reported a conversion rate of 25%, LS showed only minimal short-term quality-of-life benefits compared with OS in an intention-to-treat analysis, probably due to the high conversion rate. Moreover, they pointed out that patients assigned to laparoscopy-assisted colectomy who required intraoperative conversion to open colectomy had slightly poorer quality-of-life outcomes than patients who

**TABLE 3.** Length of the First Stapler Cartridge Fired for Rectal Transection\*

Length of the First Stapler Cartridge (mm)	Sigmoid Colon/Rectosigmoid†	Upper Rectum†	Middle/Lower Rectum
60	34	16	0
45	2	5	7
30	0	0	3

\**P* < 0.01 between groups, Kruskal-Wallis test.

†*P* < 0.01 versus middle/lower rectum, Boneferroni test.

**TABLE 4.** Operative and Postoperative Results

	Sigmoid Colon/Rectosigmoid	Upper Rectum	Middle/Lower Rectum
Operative time,* min (range)	221 (135-348)†	244 (190-328)‡	315 (190-392)
Blood loss,* mL (range)	29 (6-161)†	24 (10-198)†	124 (17-265)
Conversion	0	0	0
Liquid intake, d (range)	1 (1-4)	1 (1-3)	1 (1)
Solid food, d (range)	3 (2-5)	3 (3-4)	3 (2-4)
Hospital stay, d (range)	8 (7-12)	8 (7-11)	9 (7-17)

\**P* < 0.01 between groups, repeated-measure analysis of variance.

†*P* < 0.01 versus middle/lower rectum, Scheffe test.

‡*P* < 0.05 middle/lower rectum, Scheffe test.

successfully underwent minimally invasive resection, and that the length of postoperative hospital stay in the LS group requiring conversion was longer than that in patients assigned to OS (7.4 vs. 6.4 days), although statistical analysis was not performed regarding these points. If the conversion patients did not show a worse outcome than those undergoing OS, patients who might benefit from LS should be considered as candidates for LS. Further studies are necessary to evaluate postoperative and oncological outcomes of patients assigned to laparoscopy-assisted colectomy who then require intraoperative conversion.

The results of the current study suggested that laparoscopic approaches to middle/lower rectal carcinoma do not compromise early postoperative recovery, such as days to oral feeding and length of hospitalization. Previous studies reported an anastomotic leakage rate of 5.7% to 21% in patients undergoing Lap-LAR.<sup>6-12</sup> Some authors have recommended a covering ileostomy as a routine step in Lap-LAR.<sup>6,10,27</sup> At present, patients with a preoperative diagnosis of T1-T2, middle/lower rectal carcinoma are required to decide whether they prefer to undergo OS or LS, after being given full information at our institution.

**TABLE 5.** Morbidity and Mortality\*

	Sigmoid Colon/Rectosigmoid	Upper-Rectum	Middle/Lower Rectum
Mortality	0	0	0
Morbidity			
Wound sepsis	2	1	0
Bowel obstruction	1	0	1
Urinary tract infection	1	0	0
Abscess	0	0	1
Neurogenic bladder	0	1	0
Anastomotic leakage	0	0	0
Total	4	2	2

\**P* > 0.05.

In this study, the authors evaluated the safety of laparoscopic rectal transection using an endolinear stapler, which is one of the most technically difficult procedures in Lap-LAR. To date, we have not observed serious complications, such as anastomotic leakage. However, this surgical procedure remains technically difficult. We consider that this method should not be attempted if it is not performed by a laparoscopic surgical team with sufficient experience in LS. Regarding a surgical procedure that can be placed between OS and Lap-LAR, Vithiananthan et al<sup>28</sup> reported a hybrid method. In their procedure, they mobilized the left-sided colon and completed high ligation of the inferior mesenteric vessels with the use of the pneumoperitoneum, and then, from the inferior midline incision measuring 8 cm or longer, they performed rectal mobilization, mesorectal division, rectal transection, and anastomosis by DST using the OS tools. They noted that the mean incision length was 11.1 cm, which is longer than in Lap-LAR but shorter than in OS and that the patients treated with this method showed a significantly faster postoperative recovery than those treated with OS. Hand-assisted laparoscopic surgery may also be another treatment option.<sup>29</sup> However, compared with the standard Lap-LAR technique evaluated in this study, both of these methods may need a larger incision. With the surgeon's proficiency in the surgical procedure and the improvement in and development of instruments, the safety of standard Lap-LAR will probably be established; however, it is important to remember that this surgical technique cannot be employed at an early stage of the learning curve of laparoscopic surgery.

In conclusion, the findings of the present study demonstrate that laparoscopic intracorporeal rectal transection with DST anastomosis can be performed safely without increased morbidity or mortality. Even at present, there are few prospective, randomized trials investigating the short-term and oncological outcomes in patients with middle/lower rectal carcinoma, perhaps mainly because Lap-LAR has not been widely performed compared with LS for colon/upper rectal carcinoma due to the technical difficulties. The radical resection of middle/lower rectal cancers is a procedure that requires advanced technical skills in OS, to say nothing of Lap-LAR; however, we believe that use of Lap-LAR for middle/lower rectal carcinoma will expand with improvements in technology and surgeons' experience in the near future.

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一般外科におけるクリニカルパス

クリニカルパスの実際－われわれはこうしている－  
食道・胃・大腸外科  
腹腔鏡補助下大腸切除術のクリニカルパス

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一般外科における クリニカルパス

§ 1 クリニカルパスの実際—われわれはこうしている—

食道・胃・大腸外科

腹腔鏡補助下大腸切除術のクリニカルパス

*Clinical pathways for laparoscopic assisted colorectal surgery*

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大腸癌待機手術は、術式や経過が定型的であり、クリニカルパスによる患者管理を行いやすい。当科では、術後回復の若干早い腹腔鏡補助下手術と開腹手術を分けてクリニカルパスを作成している。腹腔鏡補助下手術に対しては、腹会陰式直腸切断術とそれ以外の術式の2種類のクリニカルパスを作成して患者管理を行っている。そのクリニカルパスについて概説する。

はじめに

クリニカルパスは疾患に対する治療計画のことである。医療スタッフだけではなく患者にもクリニカルパスを提示することにより、その内容を共有することが重要である。クリニカルパスの導入により、各医療スタッフがそれまでの経験にもと基づく独自の計画にて患者を管理するのではなく、患者管理を標準化させ質の高い医療水準を維持できるようにすることが主目的である。一方、患者側にとっても、一連の治療の流れを把握することができるため、治療に対する不安がなくなり、積極的に治療に参加することができる。しかし、提示されたクリニカルパス通りに治療が進まないと、一層、不安が増す結果となることもあり、バリエーションが生じた場合には、不安を取り除くために、詳細な説明を行わなければならない。また、主目的ではないが、クリニカルパスは医療経営上の問題点を明確にできるため、入院医療包括化への対策として導入する施設が増えている。

●クリニカルパスの導入

クリニカルパスの導入にあたっては、他施設のクリニカルパスを最初からそのまま流用するのは望ましくない。成書に掲載されているクリニカルパスは、その施設において何回かの改定を経て完成に近いものが掲載されていることが多い。最初からそのようなクリニカルパスを導入しようとしても、医療スタッフ全員のコンセンサスおよび協力がなければ成り立たないからである。他施設のクリニカルパスを提示しても、自施設における今までの計画との間に大きな隔りがあることや、地域や社会環境の違いもあることから、医療スタッフは不安が先立ち受け入れることができないと考えるのは当然のことである。最初は、他施設のクリニカルパスは参考程度として、実際に行われている治療経過を考慮して医療スタッフ全員が受け入れることができる独自のクリニカルパスを作成すべきである。



負のバリエーションが生じる原因は、指示を出し忘れた、あるいは、故意に出さなかったといった医療スタッフ側の原因と、バリエーションが生じて指示を中止したために起こる場合があるが、医療スタッフ全員が受け入れていないと、医療スタッフ間の相互チェック機能も働かず、前者が原因となって負のバリエーションが生じることが多くなる。大事なことは、負のバリエーションがなるべく出ないクリニカルパスを作成することである。負のバリエーションが多いと医療スタッフから不信感や不満が出て、作成したクリニカルパスが形骸化してしまう可能性がある。また、クリニカルパスは患者にも提示するため、負のバリエーションが多いと患者側も不安や不信感を持つ可能性がある。さらに、負のバリエーションが発生した場合、患者および家族に対してその原因などの説明を行わなければならない、医療スタッフの精神的負担も増大する結果となる。最初から完璧なクリニカルパスを作成することは困難で、定期的に正および負のバリエーションの原因を検討して修正を加え、施設に合わせたよりよいクリニカルパスを作成してゆけばよい。

## ●患者用クリニカルパスと医療スタッフ用クリニカルパス

患者用クリニカルパスと医療スタッフ用クリニカルパスの2種類を作成して運用している。患者用も医療スタッフ用と内容は同じであるが、患者は高齢者が多いことや医学用語を正確に理解できないことが多いため、患者用では文字を大きくし、絵などを交えて平易な文章で作成している。具体的には、A3用紙にフォント12のゴシック体を用いて、高齢者でも見やすいようにしている。医療スタッフ用は、指示もれがないか、あるいはクリニカルパス通りに診療が進んでいるかを毎日チェックできるように、チェックリスト形式のクリニカルパスを使用している。また、項目ごとの表形式にして時系列で記載すると理解しやすい。

## ●クリニカルパスの種類

待機的大腸癌手術は、術式や経過が定型的であり、クリニカルパスによる患者管理を行いやすい。しかし、術式によっては経過および管理に違いがあるので、一種類だけのクリニカルパスだけでは管理しにくい。結腸癌と直腸癌、さらに、直腸癌では自律神経系の温存状態(排尿機能障害の可能性の有無)やストマの有無による分類が必要である。また、術後回復の若干早い腹腔鏡補助下手術と開腹手術を分けてクリニカルパスを作成している。当科の腹腔鏡補助下手術は、結腸癌と直腸S状部は進行癌も適応としているが、上部、下部直腸癌は早期癌しか適応としていない。したがって、基本的に自律神経系を全温存しているため、腹会陰式直腸切断術とそれ以外の術式の2種類のクリニカルパスを作成して腹腔鏡補助下大腸切除術の患者管理を行っている(表1~6)。

## ●クリニカルパスの内容

### 1. 術前検査

術前検査はすべて外来で行っている。これは、入院日数や検査項目が限られている入院医療包括化への対策として行っている。

### 2. 入院日

入院医療包括化は入院日数が一定期間以上長くなると1日入院単価が下がるため、術前入院期間はなるべく短くする。手術2日前から術前腸管処置を開始するため、この日に入院とし、入院日には、手術の説明と同時に、患者用のクリニカルパスを提示しながらその説明も行う。患者および家族の中には、術後1週間後から食事が取れる、術後1ヵ月ぐらい入院するといった従来の経過を想定している人たちもいるので、創の消毒、食事の開始時期、退院日などについてもよく説明し、この時点で患者の不安を取り除き十分な理解を得ておくことがもっとも大切である。この時に了解を

表1-1 医療スタッフ用 腹腔鏡下大腸手術 [APR 症例を除く]

患者名

	入院/手術前々日	手術前日	手術当日(術前)	(術後)	第1病日
1. 点滴・注射	<input type="checkbox"/> 点滴1500 ml	<input type="checkbox"/> 点滴1500 ml	<input type="checkbox"/> 点滴100 ml/hr	<input type="checkbox"/> 点滴80 ml/hr	<input type="checkbox"/> 点滴1500 ml
			<input type="checkbox"/> 第2世代抗生物質 1g(手術開始時) <input type="checkbox"/> 3時間後, 1g追加投与	<input type="checkbox"/> 疼痛時指示 <input type="checkbox"/> 発熱時指示 <input type="checkbox"/> 嘔気時指示 <input type="checkbox"/> 不眠時指示 <input type="checkbox"/> 硬膜外指示	
2. 内服薬	<input type="checkbox"/> 内服薬確認 (内服継続の必要性を判断)  <input type="checkbox"/> 術前腸管処置開始 <input type="checkbox"/> 11時ニフレック1P <input type="checkbox"/> 21時プルゼニド4T	<input type="checkbox"/> 不眠時指示			<input type="checkbox"/> 内服薬再開 (必要に応じて中止した内服の再開)
3. 一般指示		<input type="checkbox"/> 清拭, 除毛	<input type="checkbox"/> 6時半 GE 110 ml	<input type="checkbox"/> ネブライザー <input type="checkbox"/> 酸素投与	<input type="checkbox"/> ネブライザー <input type="checkbox"/> 酸素中止
4. 外科的処置	<input type="checkbox"/> パッチテスト			<input type="checkbox"/> 包交	<input type="checkbox"/> 包交  <input type="checkbox"/> 胃管抜去 <input type="checkbox"/> 導尿カテ抜去
5. 食事	<input type="checkbox"/> 入院後は禁食 (水分は可)	<input type="checkbox"/> 禁食 (21時まで水分可)	<input type="checkbox"/> 禁飲食	<input type="checkbox"/> 禁飲食	<input type="checkbox"/> 飲水可
6. 検査	<input type="checkbox"/> 胸腹 X-P( / ) <input type="checkbox"/> ECG( / ) <input type="checkbox"/> スパイロ( / ) <input type="checkbox"/> 血算, 生化学( / ) <input type="checkbox"/> 感染症・血型( / ) <input type="checkbox"/> 腫瘍マーカー( / ) <input type="checkbox"/> 検尿( / ) <input type="checkbox"/> BE( / ) <input type="checkbox"/> CS( / ) <input type="checkbox"/> EUS( / ) <input type="checkbox"/> 腹部エコー( / ) <input type="checkbox"/> CT( / ) <input type="checkbox"/> MRI( / )			<input type="checkbox"/> 採血 <input type="checkbox"/> X線	<input type="checkbox"/> 採血 <input type="checkbox"/> X線
7. 説明・指導	<input type="checkbox"/> 入院時診療計画書 <input type="checkbox"/> 病歴聴取 <input type="checkbox"/> 手術説明/関連書類の承諾書	<input type="checkbox"/> 麻酔科ラウンド		<input type="checkbox"/> 手術結果説明	
バリエーション	<input type="checkbox"/> なし	<input type="checkbox"/> なし	<input type="checkbox"/> なし	<input type="checkbox"/> なし	<input type="checkbox"/> なし
バリエーションの理由					

得ておかないと、処置や退院の当日になってトラブルの原因になることもあるので注意が必要である。

### 3. 予防的抗生物質投与

当科では、術中の第2世代セフェム系抗生物質投与しか行っていない。閉腹前に小切開創を1,000 mlの生食で洗浄することで、術後の創感染

表1-2 医療スタッフ用 腹腔鏡下大腸手術 [APR 症例を除く]

診断

手術術式

第2病日	第3病日	第4病日	第5病日	第6病日	第7病日	第5~10病日/退院
<input type="checkbox"/> 点滴1500 ml	<input type="checkbox"/> 点滴1000 ml	<input type="checkbox"/> 点滴なし				
<input type="checkbox"/> 消化剤内服開始(便の性状により適宜増減)						
<input type="checkbox"/> 包交	<input type="checkbox"/> 縫合創の包交なし(ガーゼも不要)				<input type="checkbox"/> 全抜糸	
<input type="checkbox"/> 硬膜外カテ抜去	<input type="checkbox"/> ドレーン抜去 (挿入の場合のみ)				早期退院の場合は外来抜糸	
<input type="checkbox"/> 水分	<input type="checkbox"/> 低残渣食 全粥	<input type="checkbox"/> 同左	<input type="checkbox"/> 一般食 常食	<input type="checkbox"/> 同左	<input type="checkbox"/> 同左	<input type="checkbox"/> 同左
(希望あれば全粥およびパン食も可)						
						退院日: 第 病日 <input type="checkbox"/> 退院処方 確認・説明 <input type="checkbox"/> 外来予約 <病理の結果が出る頃に> ( 月 日)
<input type="checkbox"/> なし	<input type="checkbox"/> なし	<input type="checkbox"/> なし	<input type="checkbox"/> なし	<input type="checkbox"/> なし	<input type="checkbox"/> なし	<input type="checkbox"/> なし

は約7%である。一般的にみても、術後1~3日間の予防的投与を行えば十分である。入院医療包括化では、手術当日以外の薬剤の請求ができないため、術後には使用しないほうが得策である。し

かし、使用しないことにより術後のSSIが増加すれば、入院日数が長くなり、1日入院単価が下がってしまう。この点についてどうするかは、各施設の考え方や経験から決定すればよい。

表 2 - 1 医療スタッフ用 腹腔鏡下大腸手術 [APR 症例]

	患者名				診断		
	入院/手術前々日	手術前日	手術当日(術前)	(術後)	第1病日	第2病日	第3病日
1. 点滴・注射	<input type="checkbox"/> 点滴1,500 ml	<input type="checkbox"/> 点滴1,500 ml	<input type="checkbox"/> 点滴 100 ml/hr <input type="checkbox"/> 第2世代抗生物質 1g(手術開始時) <input type="checkbox"/> 3 時間後, 1g 追加投与	<input type="checkbox"/> 点滴80 ml/hr <input type="checkbox"/> 疼痛時指示 <input type="checkbox"/> 発熱時指示 <input type="checkbox"/> 嘔気時指示 <input type="checkbox"/> 不眠時指示 <input type="checkbox"/> 硬膜外指示	<input type="checkbox"/> 点滴1500 ml	<input type="checkbox"/> 点滴 1500ml	<input type="checkbox"/> 点滴 1000ml
2. 内服薬	<input type="checkbox"/> 内服薬確認 (内服継続の必要性を判断) <input type="checkbox"/> 術前腸管処置開始 <input type="checkbox"/> 11時ニフレック1P <input type="checkbox"/> 21時プルゼニド4T	<input type="checkbox"/> 不眠時指示  <input type="checkbox"/> 11時 ラクソベロン2.5 ml			<input type="checkbox"/> 内服薬再開 (必要に応じて中止した内服の再開)	<input type="checkbox"/> 消化剤内服開始(便の性状により適宜増減)	
3. 一般指示			<input type="checkbox"/> 6時半 GE110 ml	<input type="checkbox"/> ネブライザー <input type="checkbox"/> 酸素投与	<input type="checkbox"/> ネブライザー <input type="checkbox"/> 酸素中止		
4. 外科的処置	<input type="checkbox"/> パッチテスト			<input type="checkbox"/> 包交	<input type="checkbox"/> 包交 <input type="checkbox"/> 胃管抜去	<input type="checkbox"/> 包交 <input type="checkbox"/> 硬膜外カテ抜去	<input type="checkbox"/> 縫合創の包交なし (ガーゼも不要) ドレーン抜去
5. 食事	<input type="checkbox"/> 入院後は禁食 (水分は可)	<input type="checkbox"/> 禁食 (21時まで水分可)	<input type="checkbox"/> 禁飲食	<input type="checkbox"/> 禁飲食	<input type="checkbox"/> 飲水可	<input type="checkbox"/> 水分	<input type="checkbox"/> 低残渣食 全粥
6. 検査	<input type="checkbox"/> 胸腹 X-P( / ) <input type="checkbox"/> ECG( / ) <input type="checkbox"/> スパイロ( / ) <input type="checkbox"/> 血算, 生化学( / ) <input type="checkbox"/> 感染症・血型( / ) <input type="checkbox"/> 腫瘍マーカー( / ) <input type="checkbox"/> 検尿( / ) <input type="checkbox"/> BE( / ) <input type="checkbox"/> CS( / ) <input type="checkbox"/> EUS( / ) <input type="checkbox"/> 腹部エコー( / ) <input type="checkbox"/> CT( / ) <input type="checkbox"/> MR( / )			<input type="checkbox"/> 採血 <input type="checkbox"/> X 線	<input type="checkbox"/> 採血 <input type="checkbox"/> X 線		
7. 説明・指導	<input type="checkbox"/> 入院時診療計画書 <input type="checkbox"/> 病歴聴取 <input type="checkbox"/> 手術説明 関連書類の承諾書	<input type="checkbox"/> 麻酔科ラウンド		<input type="checkbox"/> 手術結果説明			
バリエーション	<input type="checkbox"/> なし	<input type="checkbox"/> なし	<input type="checkbox"/> なし	<input type="checkbox"/> なし	<input type="checkbox"/> なし	<input type="checkbox"/> なし	<input type="checkbox"/> なし
バリエーションの理由							

4. 食事の開始時期および上げ方

吻合部の強度よりも術後の消化管の蠕動運動の有無が重要であると考えている。蠕動運動の再開時期は、開腹手術と腹腔鏡補助下手術では差があ

るといのが実感である。手術を午前に行ったか午後に行ったかによって違うという考えもあるが、当科ではいずれの場合でも、腹腔鏡下手術では1病日目から水分摂取を開始している。食事の