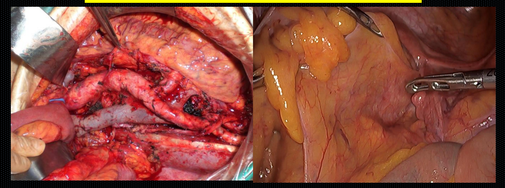
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Clinical outcomes of perforated colorectal cancer surgery –impact of laparoscopic surgery

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Open vs. Laparoscopic



Introduction

Perforated colorectal cancer is a fatal disease that causes peritonitis and sepsis, but is less commonly reported than standard colorectal cancer. It is often associated with bowel edema and dilatation, which limits the indications for laparoscopic surgery.

Object

We retrospectively analyzed the outcomes of **30 open surgery (O)** and **20 laparoscopic (L)** (5 cases with open transition) cases of all perforated colorectal cancer operated between January 2014 and April 2023 at Kansai Rosai Hospital (Department of Gastroenterology only) .We excluded iatrogenic disorders due to post-EMR , ESD perforation , pretreatment.

Characteristics

Table.1 shows that patient and tumor characteristics.There are no significant differences in patient and tumor background between open surgery and laparoscopic groups.

Result

Table1. patient and tumor characteristics

	Open	Laparoscopic	total	P value
Age	78.5(62-90)	71.5(35-85)	74(35-90)	0.026※
Sex(Man/Female)	19/11	6/14	25/25	0.021
BMI(kg/m²)	20.23(14.4-36.41)	21.51(15.8-29.0)	20.39	0.17※
WBC(×10³/μL)	8.35(1.9-33.5)	8.65(4.2-36.5)	8.5(1.9-36.5)	0.62※
CRP (mg/dL)	11.75(0.2-36.9)	11.5(0.1-30.3)	11.1(0.1-36.9)	0.49※
PLT(×10⁴/μL)	25.8(13.6-57.7)	32.55(19.8-58.8)	27.3(13.6-58.8)	0.067※
CEA(ng/ml)	14.5(3.6-1254)	4.8(1.4-9813)	11.7(1.4-9813)	0.29※
CA19-9(U/ml)	71.65(10-377.6)	19.95(3.3-5000)	35.1(3.3-5000)	0.28※
ileus	12(25%)	7(35%)	19(38%)	0.72
Tumor (right/left/center)	7/19/4	3/13/4	10/32/8	0.69
Tumor size(mm)	40(10-140)	50(10-80)	45(10-140)	0.65
total	30	20	50	

Values are median(range).
BMI : Body Mass Index , WBC :White Blood Cell , CEA : Carcinoembryonic Antigen , CA19-9 :Carbohydrate antigen 19-9
P value is calculated by Pearson's chi-square test. (P※ is calculated by Wilcoxon two sample test)

Table3. pathological factors

	Open	Laparoscopic	total	P value
Surgical ablation(RM0/RM2/RMX)	27/1/1	17/0/2	44/1/3	0.45
Stage(Ⅰ/Ⅱ/Ⅲ/Ⅳ)	1/10/8/10	0/9/7/4	1/19/15/14	0.55
Number of lymph node dissected	18(0-40)	19(4-47)	18(0-47)	0.77

Discussion

It has been reported that there are many risk factors for direct operative mortality in perforated colorectal cancer to include factors such as advanced age, shock, intraperitoneal fecal mass leakage, free perforation ,oral perforation of the cancer, comorbidities, time since onset, and prolonged operative time[1]. So , we need to make careful surgical decisions in case of perforated colorectal cancer [2].

Table2. operative factors

	Open	Laparoscopic	total	P Value
operative time(min)	178(29-355)	239(153-705)	196	**0.0077**※
bleeding amount(ml)	179(0-2432)	0(0-1040)	90	**0.0004**※
Perforation site (oral/tumor/penetration/both)	12/13/4/1	4/9/7/0	16/22/11/1	0.19
Perforation form (penetration/covered/free)	4/4/22	7/5/8	11/9/30	0.058
Pollution(Hinchey Ⅰ/Ⅱ/Ⅲ/Ⅳ)	8/6/3/13	13/1/2/4	21/7/5/17	**0.0390**
Lymph node dissection(D0/1/2/3)	3/2/5/20	1/3/2/14	4/5/7/34	0.78

Values are median(range) .
P value is calculated by Pearson's chi-square test. (P※ is calculated by Wilcoxon two sumple test)

Table4. postoperative factors and complications rate

	Open	Laparoscopic	total	P value
Hospital stay(days)	27(8-188)	15(6-105)	26(8-105)	0.073※
CHDF	3(10%)	1(5%)	4(8%)	0.41
PMX	5(16.6%)	1(5%)	6(12%)	0.21
Respirator days(≧3days)	**10(33.3%)**	1(5%)	11(22%)	**0.018**
SSI(≧CDⅡ)	**13(43.3%)**	3(15%)	16(32%)	**0.035**
Anastomosis leakage(≧CDⅢ)	1(3.3%)	0(0%)	1(2%)	0.41
ileus(≧CDⅢ)	6(20%)	1(5%)	7(14%)	0.13

Values are median(range) .
P value is calculated by Pearson's chi-square test. (P※ is calculated by Wilcoxon two sumple test)

CD :Clavien-Dindo classification CDⅡ: minor complications ,CDⅢ≧:severe complications
CHDF :Continuous hemodialysis and filtration , PMX : direct hemoperfusion with polymyxinB immobilized fiber

Conclusions

The results of laparoscopic surgery were relatively good ,not considering patient background bias . In particular , the incidence of SSI and ventilator days were significantly shorter in the laparoscopy group than in the open . It is need to accumulate further cases and observe long-term observation .

References

1) H.Hidetaka . 2006 . *Prognostic Factors after Surgery for Colorectal Perforation*. Department of Surgery 1.
2) T.Sakai . 2018 . *A case of laparoscopic Hartmann surgery for perforation of rectal cancer in a very elderly patient* :Japanese Journal of Cancer and Chemotherapy