Obstructive right colon cancer: towards an optimal patient-tailored treatment strategy

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We feel honored to provide commentary on the manuscript entitled "Laparoscopic versus open colectomy for obstructing right colon cancer: A systematic review and meta-analysis" by Cirocchi *et al.* (1).

The incidence of obstructive right colon cancer and its related small bowel obstruction is less common as compared to obstructive left colon cancer. However, it is a special clinical occurrence which generates different procedural and technical strategies. Cirocchi *et al.* thoroughly reviewed these treatment options in a chronological manner. These options range from simple fecal diversion, emergency right hemicolectomy with or without proximal ileostomy, to endoluminal self-expandable metallic stent (SEMS) placement as a bridge to surgery (1-3). All of these therapeutic modalities are valid even nowadays depending on the patient's condition, the surgeon's experience, and the accessibility of institutional facilities.

Once a surgeon has decided to perform an emergency resection, another point to be considered is the surgical approach, which is the core issue of this review. With the benefit of accumulated experience with laparoscopic colectomy and due to the development of new surgical instruments, the minimally invasive approach has been applied in order to manage the emergency setting of obstructive colon cancer over the past decades. And the results have been quite encouraging, although most of the previous research is retrospective, non-randomized, and has a small number of cases (4-8). When compared to the open approach, minimally invasive surgery is not inferior in terms of perioperative surgical outcomes. It also offers all the advantages of the minimally invasive approach including enhanced postoperative recovery.

The results of the current systematic review and meta-analysis by Cirocchi *et al.* correspond to this general idea (1). All primary outcomes including the anastomotic leak rate, the 30-day postoperative mortality, the 30-day postoperative reoperation rate, and the covering stoma rate were similar in open and laparoscopic groups. As for their secondary outcomes, the 30-day postoperative overall complication rate was significantly lower in the laparoscopic group. Although operative time was considerably shorter in the open surgery group, other perioperative parameters including length of incision and estimated blood loss were in favor of the laparoscopic group. Outcomes indicating postoperative patient recovery such as the time interval for ambulation and the length of hospital stay were significantly shorter in the laparoscopic group. As a result, they concluded that emergency laparoscopic surgery for obstructive right colon cancer may achieve better outcomes and should be encouraged in this emergency scenario. However, at the same time, they warned against misinterpretation due to a small number of patients involved, selection and publication bias, and low quality evidence of the analyzed studies.

Despite they mentioned that the results must be interpreted with caution, we could hardly reach the conclusion regarding the safety and feasibility of emergency laparoscopic surgery for obstructive right colon cancer

through this review for several reasons.

First, the current review and meta-analysis are insufficient to conclude that the laparoscopic approach in obstructive right colon cancer management is safe and feasible due to scarce evidence. Theoretically, it is possible to perform a meta-analysis when at least two adequate studies are available, since a summary based on two or more studies yields a more precise evaluation of the real impact of the technique than one study alone (9). In the current review and meta-analysis, five studies were included for systematic review. However, a meta-analysis was performed by analyzing only two studies, in which a total of 78 patients (24 in the laparoscopic group and 54 in the open surgery group) were included. Those two studies have a very low level of evidence and a small number of patients enrolled, which is insufficient to draw a conclusion.

Secondly, there might be a selection and publication bias. The two studies included in the meta-analysis were retrospective and non-randomized. Consequently, a case selection bias might be inevitable. Li *et al.* described that case selection had been determined based on the surgeon's preference on a case-by-case basis (4). Ng *et al.* also outlined that the surgical approach decision was left to the surgeons, depending on their expertise and on the patient's condition (8). In their study, all laparoscopic cases were performed by colorectal experts, whereas more than half of open surgeries were performed by general surgeons. It is likely that emergency laparoscopic colectomy was performed in a carefully selected patient group. As a result, we can acknowledge that emergency laparoscopic resection is feasible in a carefully selected group, but their results should not be taken for a general rule.

Thirdly, we need to prove oncological safety before we can accept the laparoscopic approach as a standard of care or, at least, as an alternative way. The latest oncological strategy trend for colon cancer surgery is complete mesocolic excision with central vascular ligation (CME with CVL), which is a technically demanding procedure (10,11). Even with conventional laparotomy, the likelihood of intraoperative complications increases, and the rate of incomplete resection becomes significant. Although laparoscopic resection appears to be equally well-suited for CME with CVL as in open surgery, this situation is completely different in the emergency setting where a distended bowel limits the working space (12).

SEMS placement followed by elective surgery represents a promising alternative treatment for obstructive colon cancer. The efficacy of this procedure is well-established in left-sided malignant colonic obstruction since it allows for an easy endoscopic approach to the lesion and it allows patients to avoid emergency surgery, multi-staged surgery, and a diverting stoma (13,14). Despite the difficulty of the endoscopic approach and the preference of emergency resection with primary anastomosis, SEMS application has been extended to right-sided malignant colonic obstruction over the last decade (3,15). According to the recently published review article which compares mortality and morbidity rates between emergency resection and SEMS as a bridge to surgery, emergency resection for obstructive right colon cancer was associated with higher mortality and major morbidity rates including anastomotic leakage as opposed to SEMS followed by elective surgery (16).

However, there has been a continuous debate on the oncological safety of SEMS placement, since it compresses and penetrates the tumor. It may induce tumor cell dissemination, and it goes absolutely against the principle of "do not touch the tumor" (17). The European Society of Gastrointestinal Endoscopy claimed that SEMS placement as a bridge to surgery is not recommended as a standard treatment because (I) it does not reduce postoperative mortality, (II) SEMS may be associated with an increased risk of tumor recurrence, and (III) acute resection is feasible in young and fit patients (18). They recommended that the use of SEMS placement should be considered in patients who have an increased risk of postoperative mortality. Nevertheless, the evidence for long-term oncological outcomes is limited, conflicting, and still inconclusive (14,19).

Recently, two comparative studies on short-term surgical and long-term oncological outcomes between emergency resection and SEMS placement as a bridge to surgery in obstructive right colon cancer were published (20,21). Although both studies are also retrospective and have a small number of patients enrolled, their results are definitely consistent. As shown in *Table 1*, SEMS could make laparoscopic surgery more frequently performed, and that may lead to enhanced patient recovery and reduce postoperative morbidity. In terms of long-term oncological outcomes, both studies reported no significant differences in overall and disease-free survival between the two groups.

Despite the extensive review by Cirocchi *et al.* (1), evidence is too scarce to come to a conclusion, and we plunged into a dilemma. Emergency open right hemicolectomy is a generally acceptable surgical option irrespective of the surgeon's expertise or the availability of institutional facilities. However, we must take into account specific risks of higher morbidity and mortality, and

Table 1 Perioperative short-term outcomes of comparative studies between emergency surgery and self-expandable metallic stent placement as a bridge to surgery in obstructive right colon cancer

Author/ year	Type of treatment	Number of patients	Operative methods			Intraoperative complications (n)	Operative time (min)	Estimated blood loss (mL)	Retrieved LNs (n)	Postoperative morbidity (n)	Postoperative hospital stay (days)
			Open (n)	Laparoscopy (n)	Conversion (n)						
Kye *et al.*/2016	Emergency	49	33*	13	3	2	241.7±80.2	442.5±389.4	21.9±10.9	9	13.3±5.1
	SEMS	25	10	15	0	0	254.8±95.9	351.5±368.4	32.0±13.6	6	12.2±6.9
Ji *et al.*/2017	Emergency	25	22*	2	1	1	177.4±47.3	343.1±431.3*	37.5±21.1	10*	12.4±5.9
	SEMS	14	1	12	1	0	180.9±35.6	46.5±162.9	29.8±14.2	1	9.4±3.4

Values are expressed with number or mean ± standard deviation. *, statistically significant. SEMS, self-expandable metallic stent.

consider losing all the advantages of a minimally invasive approach. Emergency laparoscopic right hemicolectomy may be beneficial to reduce morbidity and mortality and to facilitate enhanced recovery, whereas its feasibility depends on the surgeon's ability, tumor resectability, and the extent of abdominal distension. SEMS placement followed by elective surgery allows patients to avoid emergency surgery and recover from an acute status with a reduced risk of postoperative morbidity. On the other hand, the debate whether this procedure is oncologically safe or not remains to be answered.

In addition, the diverse range of patient conditions, clinical severity, surgeon's expertise, and availability of facilities in this emergency setting caused by obstructive right colon cancer deserve consideration, so that a specific treatment option does not contribute to a fundamental solution. The best strategy is to be fully informed of all treatment options along with their strengths and weaknesses in order to provide an optimal, patient-tailored treatment. As evidence accumulates and surgical techniques are standardized, the treatment strategy for obstructive right colon cancer will become structured.

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