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MINIREVIEWS

Long-term outcomes after stenting as a "bridge to surgery" for the management of acute obstruction secondary to colorectal cancer

Javier Suárez, Javier Jimenez-Pérez

Javier Suárez, Department of General Surgery, Coloproctology Unit, Complejo Hospitalario de Navarra, 31008 Pamplona, Spain

Javier Jimenez-Pérez, Department of Gastroenterology, Endoscopy Unit, Hospital de La Ribera, 46600 Alzira, Spain

Author contributions: Suárez J and Jimenez-Pérez J equally contributed to this work.

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Correspondence to: Javier Suárez, MD, Department of General Surgery, Coloproctology Unit, Complejo Hospitalario de Navarra, c/Irunlarrea - 3, 31008 Pamplona, Spain. fj.suarez.alecha@cfnavarra.es
Telephone: +33-848-422179
Fax: +34-848-422303

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Abstract

Obstructive symptoms are present in 8% of cases at the time of initial diagnosis in cases of colorectal cancer. Emergency surgery has been classically considered the treatment of choice in these patients. However, in the majority of studies, emergency colorectal surgery is burdened with higher morbidity and mortality rates than elective surgery, and many patients require temporal colostomy which deteriorates their quality of life and becomes permanent in 10%-40% of cases. The aim of stenting by-pass to surgery is to transform emergency surgery into elective surgery in order to improve surgical results, obtain an accurate tumoral staging and detection of synchronous lesions, stabilization of comorbidities and performance of laparoscopic surgery. Immediate results were more favourable in patients who were stented concerning primary anastomosis, permanent stoma, wound infection and overall morbidity, having the higher surgical risk patients the greater benefit. However, some findings laid out the possible implication of stenting in long-term results of oncologic treatment. Perforation after stenting is related to tumoral recurrence. In studies with perforation rates above 8%, higher recurrences rates in young patients and lower disease free survival have been shown. On the other hand, after stenting the number of removed lymph nodes in the surgical specimen is larger, patients can receive adjuvant chemotherapy earlier and in a greater percentage and the number of patients who can be surgically treated with laparoscopic surgery is larger. Finally, there are no consistent studies able to demonstrate that one strategy is superior to the other in terms of oncologic benefits. At present, it would seem wise to assume a higher initial complication rate in young patients without relevant comorbidities and to accept the risk of local recurrence in old patients (> 70 years) or with high surgical risk (ASA Ⅲ/Ⅳ).

Key words: Self-expanding metallic stent; Colorectal cancer; Obstructive colorectal cancer; Colorectal cancer chemotherapy; Colorectal cancer surgery

Core tip: Self-expanding metal stents placement as a bridge to surgery in patients with obstructive left-colon cancer is controversial. Stent insertion is beneficial regarding perioperative morbidity, being patients with advanced age or with important comorbidity the ones who could obtain more benefit of transforming emergency surgery into elective surgery. But, on the other hand, an increase of local recurrence rate has been shown after stent placement when compared with emergency surgery, compromising oncologic outcome of these patients. Without definitive data, it seems cautious to consider emergency surgery and assume a higher initial complication rate in young patients without relevant co-morbidities avoiding the risk of local recurrence and stenting, accepting the risk of local recurrence but with a lesser perioperative complications rate, in old patients with high surgical risk.

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INTRODUCTION

Colorectal cancer is one of the most frequently diagnosed cancer in developed countries[1], with over 400000 new cases and more than 200000 cancer related deaths per year in Europe[2]. Some patients present colorectal obstruction at the time of diagnosis. Although in previous studies this situation was reported in up to 30% of patients[3], recent papers conclude that obstructive symptoms are present in 8% of cases at the time of initial diagnosis in cases of metastatic tumors[4] and also independently of the tumoral stage[5]. Emergency surgery has been classically considered the treatment of choice in these patients, although patients operated on emergency basis have poorer prognosis than those undergoing elective surgery[6]. Ascanelli *et al*[7] found a 5-year survival rate of 59% in patients electively operated in contrast with 39% in patients surgically treated on emergency basis. For some authors, this worse prognosis correlates with a lower quality surgery due to the emergency situation[8,9]. However, other studies suggest that poorer long-term prognosis in patients undergoing emergency surgery is due to a more advanced tumoral stage[10].

Some studies have been recently published supporting the possibility of performing colonic segmental resection with primary anastomosis in emergency surgery with a complication rate comparable to that of elective surgery. Zorcolo *et al*[11] analysed surgical outcomes in 323 patients and found that primary anastomosis can be performed in emergency surgery with low morbidity and mortality rates in selected patients. However, in the majority of studies, emergency colorectal surgery is burdened with higher morbidity and mortality rates than elective surgery. In a series of 989 patients, Tekkis *et al*[12] proved, after multivariate analysis, that emergency surgery is significantly associated with a higher postoperative mortality (20% *vs* 12.8%) as well as ASA classification and patient age. In another recent study comparing 171 surgically treated patients with obstructive left colon cancer by means of resection and primary anastomosis after intraoperative lavage and 1053 patients operated on elective basis, emergency surgery patients were older and with a more advanced tumoral stage. Besides, both postoperative mortality (4.1% *vs* 0.9%: $P = 0.001$) and morbidity (11.7% *vs* 7.6%: $P = 0.07$) rates were higher in obstructed patients[13].

In this clinical scenario, not all patients are candidates for surgery with primary anastomosis and so, many patients require temporal colostomy which deteriorates their quality of life and becomes permanent in 10%-40% of cases[3,14].

BENEFITS OF SELF-EXPANDABLE METAL STENTS

Self-expandable metal stents can restore large bowel transit achieving colonic decompression. Initially used in patients with non resectable malignant tumors, stents were then indicated in patients with resectable colorectal tumors and obstructive symptoms as a bridge to surgery procedure. The aim of stenting is to transform, in left colon cancer, emergency surgery into elective surgery in order to allow, with lower morbidity, mortality and stoma requirements, accurate tumoral staging and detection of synchronous lesions with CT-colonoscopy or conventional colonoscopy[15,16], stabilization of comorbidities and improvement of the nutritional status before surgery and performance of laparoscopic surgery[17]. Tejero *et al*[18] reported the outcomes of the first two patients treated with this strategy in 1994.

Although the definition of clinical success can be different in published papers, the most commonly used is to consider clinical success as the resolution of obstructive symptoms within the first 72 h after stent placement. In a systematic review including 1785 patients and 1845 stents, Watt *et al*[19] reported a clinical success rate of 92% (46%-100%). Concerning technical success, defined as the passage of the guide wire and the stent across the stricture with further appropriate stent release and expansion, the same authors reported a 96.2% success rate. A multicenter European prospective study, including 182 stented patients under the bridge to surgery indication, reported similar results for both technical (98%) and clinical success (94%) rates[20].

The advantages of stenting were confirmed in retrospective studies. Watt *et al*[19] found that the

rate of primary anastomosis performance in patients treated with elective surgery was two-fold higher than in patients operated on emergency basis. Patients electively operated presented lower stoma requirements, lower complication rate and shorter hospital stay. However, results were not so consistent in randomized control trials. Pirlet *et al*[21] randomized 60 patients with obstructive left colon cancer into two groups, emergency surgery *vs* stenting plus elective surgery. No differences were found concerning stoma performance (56% *vs* 43.3%; *P* = 0.30), mortality, morbidity or hospital stay. However, stenting technical success rate was as low as 46.7% with a perforation rate of 6.7%.

In a Dutch study, 98 patients with obstructive left colon tumors were randomized for emergency surgery or emergency stenting. No differences were found regarding 30-d mortality, overall mortality, morbidity and permanent stoma at the end of follow-up. However, patients included in the emergency surgery arm, presented a higher rate of initial stoma confection (absolute risk difference: 0.23, 95%CI: 0.04-0.40, *P* = 0.016) as well as a reduced rate of stoma related complications (between-group difference: -12.0, 95%CI: -23.7-0.2, *P* = 0.046). Stenting technical success rate was 70.2% and perforation rate 12.8%[22].

The low rates of technical success at the time of stenting in both studies and the high perforation rate of the Dutch publication are surprising, worrisome, and, to a certain extent, question the results of both studies considering that in most published papers reported technical success rates are higher than 85% and perforation rate does not exceed 5%. There is no comment in the French paper about the expertise of participant endoscopists concerning stenting, while the Dutch study mentions that colonic stenting was done by endoscopists who had placed at least 10 colonic stents. According to the recently published clinical guideline of the European Society of Gastrointestinal Endoscopy regarding stenting for obstructive colonic and extracolonic cancer, one of the recommendations is that colonic stent placement should be performed or directly supervised by an experienced operator who has performed al least 20 colonic stent placement procedures[23]. These data might have influenced the study results.

Nevertheless, perioperative results of SEMS insertion are actually better known. In a recent meta-analysis published by Huang *et al*[24] including 7 randomized control trials comparing emergency surgery and stenting plus further elective surgery (382 patients), results were more favourable in patients who were stented concerning primary anastomosis (OR = 0.28; 95%CI: 0.12-0.62; *P* = 0.002), permanent stoma (OR = 2.01; 95%CI: 1.21-3.31; *P* = 0.007), wound infection (OR = 0.31; 95%CI: 0.14-0.68; *P* = 0.004) and overall morbidity (OR = 0.30; 95%CI: 0.11-0.86; *P* = 0.03). No differences were found regarding mortality, anastomosis dehiscence and intra-abdominal infection.

Uncovered SEMS has lesser tendency to migrate than covered SEMS but showed higher tumor in growth rates. Globally, both types are equally effective and safe. Surgery might be performed 5 to 10 d after stent placement[23].

This benefit may not be the same in all groups of patients and, in old patients these benefits can be greater. Gorissen *et al*[25] demonstrated that in-hospital mortality of patients older than 75 was higher in patients undergoing emergency surgery than in those who received a stent as a bridge to surgery procedure (21% *vs* 8%; *P* = 0.228). In a study published in 2007 and based on a decision model (Markov Chain Monte Carlo), authors conclude that stenting is cheaper and more effective than emergency surgery due to a lower mortality and lower permanent stoma requirements. A low perforation rate with stenting and a high surgical risk were determinant factors to obtain these beneficial results with stenting, having the higher risk patient the greater benefit[26].

STENTING AND LONG-TERM ONCOLOGIC OUTCOMES

Although initial studies were focused on short-term results of bridge to surgery stenting, some results laid out the possible implication of stenting in long-term results of oncologic treatment. Maruthachalam *et al*[27] could demonstrate that peripheral blood levels of a tumoral marker, CK20 mRNA, increased after stent placement while did not modify after performing a diagnostic colonoscopy in patients with colorectal cancer. The consequence of this finding on tumoral behaviour is unknown. In a recent prospective multicenter study including 519 patients with stage Ⅲ colonic cancer and receiving adjuvant therapy with FOLFOX, the presence of circulating tumoral cells after surgery did not correlate with a poorer disease-free survival or overall survival[28].

Another study reported an increased perineural tumoral invasion in patients with obstructive left colon cancer and treated with a stent under the bridge to surgery indication in comparison with patients surgically treated on emergency basis. In spite of this finding, no significant differences were found regarding overall survival or disease-free survival between the two groups of patients. Even more, perineural invasion did not correlate with tumoral recurrence or 5-year survival[29]. Anyhow, the finding of an increased perineural invasion and lymph node involvement after stenting has been confirmed by other authors[30].

Kim *et al*[31] reported a shorter overall survival (38.4% *vs* 65.6%; *P* = 0.025) and 5-year disease free survival (48.3% *vs* 75.5%; *P* = 0.024) in patients with obstructive left colon cancer treated with a stent plus elective surgery than in patients with non-obstructive tumors surgically treated on elective basis. Very likely, this poor prognosis associated with stenting is not due to the stent but to the fact that stented patients presented with a large bowel obstruction.

Table 1 Data of recurrence and survival in studies comparing self-expandable metallic stents by-pass to elective surgery and emergency operation for obstructive colorectal cancer

Ref.	Perforation rate	Recurrence SEMS *vs* EO	Survival SEMS *vs* EO
Ghazal *et al*[43]	0	RR: 17.2% *vs* 13.3%; *P* = 0.228	
Saida *et al*[45]	-	RR of Dukes B: 23% *vs* 14%; *P* = 0.51)	3 yr-OS: 48% *vs* 50% 5 yr-OS: 40% *vs* 44%. Log-rank test: *P* = 0.84 DFS of Dukes B: Log-rank test: *P* = 0.71
Alcántara *et al*[46]	0	RR: 53.3% *vs* 15.3%; *P* = 0.055	DFS: 25.4 m *vs* 27 m; *P* = 0.096 OS: Log-rank test: *P* = 0.843
Tung *et al*[34]	0		5 yr-OS: 48% *vs* 27%; *P* = 0.076 5 yr-DFS: 52% *vs* 48%; *P* = 0.63
Pessione *et al*[47]	0		2 yr-OS: 66.6% *vs* 28.5%
Gianotti *et al*[40]	1.2%		HR: 0.412 *P* = 0.007 OS: Log-rank test: *P* = 0.004
van den Berg *et al*[42]	1.7%	5 yr-RR of stage Ⅰ-Ⅱ: 33% *vs* 26%; *P* = 0.81 5 yr-RR of stage Ⅲ: 35% *vs* 51%; *P* = 0.24 3 yr-RR of stage Ⅳ: 32% *vs* 58%; *P* = 0.30	5 yr-OS of stage Ⅰ-Ⅱ: Log-rank test: *P* = 0.85 5 yr-OS of stage Ⅲ: Log-rank test: *P* = 0.48 5 yr-OS of stage Ⅳ: Log-rank test: *P* = 0.08
Kim *et al*[29]	3.3%	RR: 35% *vs* 35%; *P* = 1.000 LR: 0% *vs* 1.6%	5 yr-OSR: 67.2% *vs* 61.6%; *P* = 0.386 5 yr-DFSR: 61.2% *vs* 60%; *P* = 0.932 5 yr-CRSR: 77% *vs* 65%; *P* = 0.233
Sabbagh *et al*[33]	4.2%	Patients with no perforation or metastases 34% *vs* 28 %	Patients with no perforation or metastases 5 yr-OSR: 30% *vs* 67%; *P* = 0.001 5 yr-DFSR: 27% *vs* 43%; *P* = 0.16 5 yr-CSMR: 29% *vs* 22%; *P* = 0.62
Kavanagh *et al*[44]	4.3%	RR 17.3% *vs* 23%	OS: Log-rank test: *P* = 0.13 CSM: Log-rank test: *P* = 0.21 CSMR: 13% *vs* 15.3%
Dastur *et al*[48]	5.2%		3 yr-OS: 48% *vs* 46%; *P* = 0.54
Gorissen *et al*[25]	8%	RR: 31.6 *vs* 28.2; *P* = 0.824 LRR: 23% *vs* 15%; *P* = 0.443 LRR in young patients: 32% *vs* 8%; Log-rank test: *P* = 0.038	CSMR: 24.1% *vs* 37.2%; *P* = 0.180
Sloothaak *et al*[32]	11.5%		4 yr-DFS: 30% *vs* 49%: Log-rank test: *P* = 0.149 4 yr-DSS: 66% *vs* 87%: Log-rank test: *P* = 0.061 4 yr-OS: 58% *vs* 67%: Log-rank test: *P* = 0.468 Stent-related perforation *vs* no perforation 4 yr-DFS: 0% *vs* 45%: Log-rank test: *P* = 0.007 4 yr-DSS: 60% *vs* 69%: Log-rank test: *P* = 0.099 4 yr-OS: 50% *vs* 62%: Log-rank test: *P* = 0.478
Erichsen *et al*[49]	Non-reported	5 yr-RR: 38% *vs* 29%; OR: 1.12; 95%CI: 0.99-1.28	5yOSR: 49% *vs* 40%; OR: 0.98; 95%CI 0.9-1.07
Choi *et al*[50]	Non-reported		5yOSR: 97.8% *vs* 94.3%; *P* = 0.469

RR: Recurrence rate; LRR: Local recurrence rate; OS: Overall survival; OSR: Overall survival rate; DFS: Disease-free survival; DFSR: Disease-free survival rate; CRSR: Cancer related survival rate; CSM: Cancer-specific mortality; CSMR: Cancer-specific mortality rate; DSS: Disease-specific survival; EO: Emergency operation; SEMS: Self-expandable metallic stents.

Going beyond these findings with unclear significance, more relevant data are available now.

Perforation after stenting and tumoral recurrence

Results of stent-in 2 trial showed that, although no significant statistical differences were found regarding disease free survival, cancer related survival and overall survival when comparing patients treated with a stent and further elective surgery and patients who underwent emergency surgery, tumoral recurrence was significantly higher in patients who had been stented and presented a colonic perforation than in those also stented but without any secondary complication (4 year disease free survival: 0% *vs* 45%; *P* = 0.007). However, this fact had no influence on overall survival (4 year overall survival: 50% *vs* 62%; *P* = 0.478)[32]. Gorissen *et al*[25] also reported a slightly higher recurrence rate in the group of stented patients (31.6% *vs* 28.2%; *P* = 0.824). This difference was due to an increased local recurrence in these patients (23% *vs* 15%; *P* = 0.443). Patients younger than 75 years had a significantly higher local recurrence rate (32% *vs* 8%; *P* = 0.038) and, after multivariate analysis, stenting almost reached statistical significance as a risk factor for local recurrence (OR = 12.45, 95%CI: 0.99-156.08; *P* = 0.051). However, it is paramount to remark that the perforation rate in these two studies was 11.5% and 8% respectively (Table 1).

Oncologic benefits of stenting and further elective surgery

In addition to colonic perforation, other factors can affect oncologic evolution of these patients. Quality of surgery could be better in previously stented patients. Sabbagh *et al*[33] reported a significant higher lymph node retrieval

Table 2 Data of lymph node count, administration of adjuvant chemotherapy and laparoscopic surgery in studies comparing self-expandable metallic stents by-pass to elective surgery and emergency operation for obstructive colorectal cancer

Ref.	Lymph node count SEMS *vs* EO	Adjuvant chemotherapy SEMS *vs* EO	Laparoscopic surgery SEMS *vs* EO
Ghazal *et al*[43]		80% *vs* 76.7%	
Saida *et al*[45]		66% *vs* 53%; *P* = 0.54	
Alcántara *et al*[46]	17.7 *vs* 24.2; *P* = 0.099		
Tung *et al*[34]	23 *vs* 11; *P* = 0.005	75% *vs* 54%; *P* = 0.2	
Gianotti *et al*[40]	23 *vs* 18; *P* = 0.08	46.7% *vs* 34%; *P* = 0.28	38.7% *vs* 0%; *P* = 0.000
van den Berg *et al*[42]	Lymph node harvest > 12 62.7% *vs* 60.7%; *P* = NS	39 *vs* 39; *P* = NS	
Kim *et al*[29]	28.9 *vs* 24.4; *P* = 0.25	84% *vs* 65.7%; *P* = 0.085	
Sabbagh *et al*[33]	22 *vs* 15; *P* = 0.002	56.2% *vs* 43.6%; *P* = 0.28	
Kavanagh *et al*[44]	17 *vs* 17; *P* = 0.29	36% *vs* 46%; *P* = 0.29	27% *vs* 12%; *P* = 0.1
Gorissen *et al*[25]		41.6 *vs* 25.6%; *P* = 0.13	59.6% *vs* 23%; *P* = 0.001
Sloothaak *et al*[32]	15 *vs* 13; *P* = 0.180	13 *vs* 15; *P* = 1.000	

SEMS: Self-expandable metallic stents; EO: Emergency operation.

in the surgical specimen of patients electively operated after initial bridge to surgery stenting, reaching statistical significance in some published papers. In a French study, the number of removed lymph nodes was 22 in the stenting group and 15 in the emergency surgery group (*P* = 0.002). Results were similar in an Asian publication (23 *vs* 11; *P* = 0.005)[34]. Significant differences were not reached in other reports (Table 2). In this sense, several studies have correlated the number of removed lymph nodes with survival[35,36]. Furthermore, Tung *et al*[34] reported a higher percentage of curative resection surgery in patients previously stented (91.6% *vs* 54.1%; *P* = 0.01).

Moreover, stent placement is associated with a decreased postoperative complication rate, which is relevant regarding survival[24]. In a recent analysis including 12075 patients, it has been shown that post-operative complications are associated with shorter survival (HR = 1.24; 95%CI: 1.15-1.34; *P* = 0.001). Analysing complications, infectious complications had a significant influence on long-term survival (HR = 1.31; 95%CI: 1.21-1.42; *P* = 0.001)[37].

Another potential benefit could be the percentage of patients receiving adjuvant chemotherapy. A non-statistically significant higher percentage of patients received adjuvant chemotherapy after SEMS placement in seven of ten studies (Table 2).

Finally, the number of patients who can be surgically treated with laparoscopic surgery is larger in patients operated on elective basis after bridge to surgery stenting than in the group of patients undergoing emergency surgery. Laparoscopic surgery could have a beneficial effect on long-term survival. In a randomized study published by Lacy *et al*[38] including 219 patients with colonic cancer, laparoscopic surgery was significantly related to lower recurrence rate (HR = 0.47; 95%CI: 0.23-0.94, *P* = 0.03), cancer-related mortality (HR = 0.44; 95%CI: 0.21-0.92; *P* =0.03) and overall mortality (HR = 0.59; 95%CI: 0.35-0.98; *P* = 0.04) when compared with open surgery. A similar finding has been reported from COLOR Ⅱ trial; in patients with stage-Ⅲ rectal cancer disease-free survival rate was 64.9% in the laparoscopic surgery group and 52% in the open surgery group (difference 12.9 percentage points, 95%CI: 2.2-23.6)[39]. In Gorissen *et al*[25] publication, 59.6% of stented patients and 23.2% of patients who underwent emergency surgery were operated by means of laparoscopic surgery (*P* < 0.001). Gianotti *et al*[40] also found significant differences concerning laparoscopic surgery performance when comparing stented patients and emergency surgery patients (63.3% *vs* 0%; *P* = 0.001) (Table 2).

Stenting vs emergency surgery: Which strategy is more beneficial regarding oncologic outcomes?

At present, there are no consistent studies able to demonstrate that one strategy is superior to the other in terms of oncologic benefits.

In a multicenter French study, 5-year overall survival was lower in the group of stented patients than in the emergency surgery group after excluding patients with colonic perforation or metastases at the time of hospital admission (30% *vs* 67%; *P* = 0.001)[33]. However, the type of patient (more stage Ⅳ patients in one center) and the type of treatment (stenting only in one center) was different in each participating hospital, fact which was not taken into account in multivariate analysis. Moreover, it really attracts attention that with a similar 5-year cancer related mortality (29% *vs* 22%; *P* = 0.62), overall survival differences are considered attributable to one therapeutic strategy.

In stent-in 2 trial, there was a non significant benefit in the emergency surgery group concerning 4-year disease free survival (Stenting: 30% *vs* Emergency Surgery: 49%; *P* = 0.149) and 4-year overall survival (Stenting: 58% *vs* Emergency Surgery: 67%; *P* = 0.468) in relation to colonic perforation after stenting[32] and, a higher rate of local recurrence in young patients was reported by Gorissen[25].

However, these results have not been reproduced in other studies with lower stent-related perforation rates. Kim *et al*[29] reported a similar overall recurrence rate

in both groups of patients (Stenting: 35%; Emergency Surgery: 35%; *P* = 1), with non-significant better results concerning 5-year disease free survival (66.7% *vs* 54.8%; *P* = 0.948) and 5-years overall survival (100% *vs* 77.9%; *P* = 0.103) in the stenting group. In this study no case of local recurrence was registered in the stenting group. Tung *et al*[34] also reported an almost significant benefit in the stenting group regarding 5-year overall survival (48% *vs* 27%: *P* = 0.076) and Gianotti *et al*[40] demonstrated that stenting was the only parameter related to long-term survival (HR = 0.412; 95%CI: 0.217-0.785; *P* = 0.007). Stent related perforation rate in these three studies was 3.3%, 0% and 1.2% respectively. In a recent meta-analysis including 8 clinical trials, four of them reporting long-term results, no significant differences were found regarding 1-year survival (HR = 1.07; 95%CI: 0.87-1.31; *P* = 0.51), 2-year survival (HR = 1.14; 95%CI: 0.98-1.34; *P* = 0.10) and 3-year survival (HR = 1.08; 95%CI: 0.90-1.31; *P* = 0.39) although it was always better in the stenting group[41]. Other studies which evaluate long-term results comparing stenting plus elective surgery *vs* emergency surgery do not find statistical differences in favour of any of the two strategies. Table 1 includes data regarding stent-related perforation, recurrence and survival. Oncologic evolution seems to be better in stented patients while the perforation rate is lower than 8% (Table 1).

In summary, we can't assure that stenting has a deleterious or beneficial effect on oncologic prognosis unless in those cases in which the patient presents a stent-related perforation.

Quality of life

The relevance of choosing one treatment strategy or the other concerning its influence on patient's quality of life has been seldom studied. In the Dutch study, quality of life was assessed with EORTC QLQ-C30 and QLQ-C38 questionnaires and no differences were found comparing stenting with emergency surgery, in spite of the more frequent stoma-related complications in the stenting group[22].

Other studies have described different parameters directly related with quality of life. Permanent stoma performance is significantly higher in patients undergoing emergency surgery according to Tung *et al*[34] (25% *vs* 0%; *P* = 0.03) and Gianotti (26% *vs* 6.3%: *P* = 0.01)[40] publications. In another paper it was also described that stented patients presented milder abdominal pain (4 *vs* 5; *P* = 0.02) and lower postoperative requirements of acetaminophen (8 tablets *vs* 16 tablets; *P* = 0.04) or morphine (40 mg *vs* 60 mg; *P* = 001)[17]. On the other hand, other studies did not find differences regarding permanent stoma performance[22,42].

Another interesting aspect to be assessed is the quality of bowel movements, as it is clearly related with the surgical technique. Ghazal *et al*[43] showed that patients operated on emergency basis performing a subtotal colectomy had a significantly larger number of bowel movements than patients treated with a stent and elective surgery (6 *vs* 2; *P* = 0.013). In this sense, total colectomy was less common in surgically treated patients after bridge to surgery stenting in both Kavanagh *et al*[44] (4.3% *vs* 23%; *P* = 0.027) and Saida *et al*[45] (2% *vs* 30%; *P* value is not reported) studies.

CONCLUSION

Placement of a bridge to surgery self-expandable metal stent is beneficial for the surgical treatment of patients with an obstructive colorectal cancer. This benefit is not identical for every patient, being those patients with an advanced age or with important comorbidity the ones who would obtain more benefit of transforming emergency surgery into elective surgery.

Stenting has no demonstrated influence on survival although patients who present a stent related perforation have a higher risk of tumor recurrence and shorter disease free survival. In studies with perforation rates above 8%, higher recurrences rates in young patients[25] and lower disease free survival[32] have been shown. Each medical team must be well aware of their perforation rate in order to implement improvement measures if needed.

According to the literature, in these clinical setting, we have to choose between a treatment with more perioperative complications and another therapeutic strategy which might increase the risk of tumor recurrence. It seems cautious, as it has been suggested by others[23,32], to consider emergency surgery and assume a higher initial complication rate in young patients without relevant co-morbidities avoiding the risk of local recurrence and stenting, accepting the risk of local recurrence but with a lesser perioperative complications rate, in old patients (> 70 years) with high surgical risk (ASA Ⅲ/Ⅳ).

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