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Review Article

Endoscopic stent in malignant colonic obstruction: the risk of tumor seeding☆

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ABSTRACT

Introduction: Malignant colonic occlusion is traditionally considered a surgical emergency. With the development of endoscopic techniques, metallic stents have emerged to ensure the colonic patency in nonsurgical candidates and, more recently, as a temporary measure until elective resection surgery is possible.
Materials and methods: The research was conducted in PubMed and collected a total of 46 articles, including cross-references.
Results: Ideally, intestinal occlusion should be resolved through tumor's primary resection with direct anastomosis. To avoid dehiscence of the anastomosis, tumor's resection may be performed with Hartmann's procedure. Metal stents are an alternative to emergency surgery and show excellent results in reliving colonic obstruction. However, they may have serious complications related to colonic perforation, migration and tumor dissemination.
Discussion and conclusion: Observational studies and clinical trials show discrepant results. Metal stents are increasingly accepted in palliative care but are not yet recommended as a bridge to curative surgery. Treatment should be individualized, according to surgical risk and the probability of endoscopic complications.

Prótese endoscópica no carcinoma do cólon em obstrução: risco de disseminação tumoral

Palavras-chave:
Obstrução maligna do colon
Cirurgia de emergência
Stents endoscópicos do cólon
Disseminação tumoral.

RESUMO

Introdução: A oclusão intestinal aguda maligna é tradicionalmente considerada uma emergência cirúrgica. Com o desenvolvimento das técnicas endoscópicas surgiram os stents metálicos que asseguram a patência do cólon em doentes não candidatos a cirurgia e, mais recentemente, como uma medida temporária até ser possível realizar uma cirurgia de resseção eletiva.

☆ Study conducted at Universidade do Porto, Faculdade de Medicina, Departamento de Cirurgia Geral, Porto, Portugal.

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Materiais e métodos: A pesquisa decorreu na PubMed e reuniu um total de 46 artigos, incluindo referências cruzadas.

Resultados: Idealmente, a oclusão intestinal deve ser abordada através da resseção primária do tumor com anastomose primária. Para evitar a deiscência da anastomose, a resseção tumoral pode ser realizada recorrendo à cirurgia *Hartmann* ou a um estoma derivativo sem resseção tumoral. Os stents metálicos são uma alternativa à cirurgia de emergência com resultados excelentes na resolução da obstrução cólica. Contudo, poderão levar a complicações como a perfuração cólica, a migração e a disseminação tumoral.

Discussão e conclusão: Os estudos observacionais e ensaios clínicos mostram resultados discrepantes. O uso dos stents metálicos é cada vez mais aceite como tratamento paliativo, mas ainda não são inequivocamente recomendados como ponte para uma cirurgia curativa. O tratamento deve ser individualizado de acordo com o risco cirúrgico e a probabilidade de complicações endoscópicas.

Introduction

According to the most recent oncological portuguese data, colorectal cancer is the third oncological disease most common in men, the second in women and the third in mortality incidence.[1]

High national prevalence of colon cancer and the already studied sequence of progression *adenoma-carcinoma* justify the importance of the implemented screening program, available to all population between 50 and 74 years.[2]

Malignant colonic obstruction is a dreaded complication of colorectal cancer and can be a sign of recurrence or progression of the disease.[3,4] Obstruction is the first main sign of disease in 8–29% of colorectal cancer patients given its insidious growth. Actually, 85% of colonic obstructions are due to cancer, typically the ones that persist for a long time.[5]

Patients may present with vomits, abdominal pain and distension, and change in stools or flatus's emission in the previous 24 h.[6]

Diagnosis can be challenging, crampy abdominal pain and hyperactive bowel sounds can be the only clinical findings, especially in a subacute crisis.[3]

Malignant colonic obstruction is more frequent in locally advanced cancer, in more aggressive tumors, and in elderly patients (mean age of 72 years old). This factor partially explain their bad prognosis, and elevated morbidity and mortality rates.[5,7]

Colon cancer is not the only cause of colonic obstruction. According to medical history, age and patient's gender, we must rule out benign causes, extrinsic colon compression, other cancers (particularly ovarian cancer) and peritoneal carcinomatosis.[3,6]

More than half of colon cancer cases occur in the descending colon, the colon's narrowest portion and where stools are stiffer.[7]

When malignant obstruction is suspected, physicians should require blood tests and a supine abdominal X-ray, ideally with contrast enema. Nowadays, Computerized Tomography (CT) with intravenous contrast is frequently available on the emergency setting, being the gold standard to diagnose a colonic obstruction. This exam can locate the obstruction and determine the cause in 96% of the cases (only totally confirmed with colonoscopy).[8]

Physicians should be aware that large bowel occlusion is an emergency, requiring urgent stabilization and a quick treatment decision. Resolve the obstruction and avoid the risk of perforation and sepsis is urgent and must be done in the first 6–12 h.[6,9]

The reason why we have to consider performing an emergency surgery is related to the physiopathology behind colonic obstruction. Besides mechanical occlusion, there is an important role played by neuroendocrine substances, such as serotonin and others that reduce gut motility and increase mucosa's edema. These mechanisms contribute to high intestinal pressure, vascular occlusion, bacterial spread, and high risk of perforation and sepsis.[3,4]

Most high surgical risk patients with colonic obstructions are unable to undergo an emergency surgery. To fill this gap, Self-Expandable Metallic Stents (SEMS) were developed in the 90s years and used in patients with non-resectable cancer and/or high surgical risk.

Endoscopic stents are commonly used in upper digestive tract, vascular system, and hepatobiliary tract, where surgery is often not an option.[4] Nowadays, its use before elective resection surgery in curative treatment modalities, mentioned as "bridge to surgery", is controversial. Tumor cells spread is a dangerous complication that might be associated with SEMS, affecting the oncological prognosis.

Aim

The aim of this study is to do a review of the literature that studies the use of SEMS in colonic cancer obstruction, considering that there is not consensual guidance yet. Furthermore, we discuss the possibility of malignant cells seeding with the use of SEMS, a recent topic on colonic cancer treatment debates.

Materials and Methods

The research for this article started in August of 2018 with a search in PubMed and corresponding databases by using the following terms in different combinations: malignant colonic obstruction, emergency surgery, colonic stent, complications of endoscopic stents, tumor seeding in colorectal stent.

Abstracts of all articles were read and a selection of 35 was made. Inclusion criteria included papers written in english or portuguese and published after 2005, in order to get the most recent data.

Considering that the number of articles found was limited, more 11 papers were obtained by cross-searching with the initial research.

Overall this study is based in 46 publications.

Results

1. Surgery

1.1. Resection with primary anastomosis

The ideal procedure to treat a colonic malignant obstruction is a complete resection of the tumor followed by an immediate intestinal reconstruction in a one-stage surgery. Frequently, that is not possible given its complexity and risks.

The general consensus in proximal colonic obstructions (including ascending and transverse colon) advocates a right hemicolectomy with an ileocolic anastomosis. It is a save and worldwide accepted procedure and if necessary can be converted in a stoma, although it is rare.[6]

The debate focuses on left side obstructions where there is a wide range of options.

In left side occlusions, a segmental colectomy can be performed by resecting small and localized tumors with clear margins (normally a minimum of 5 cm distal margin). Anastomosis is more risky with this approach.[10]

On the other hand, frequent indications to do a total or subtotal colectomy (radical oncological resection) are distended, ischemic or perforated colon and possible synchronous tumors (occurring in 10% of the cases).[6,11] Depending on the extension of the remaining intestine, the risk is affecting bowel function and compromise quality of life with morbidity rates being around 40–45%.[12]

Anastomosis's dehiscence is the greatest fear of surgeons in this procedure. Anastomosis near a malignant area, with portions of distended and ischemic colon, in presence of malnutrition, immunosuppression or chronic renal failure, have higher chances of dehiscence.[8]

Leakage rates go up to 20% on segmental colectomy, significantly higher compared with near 0% rates on patients undergoing subtotal or total colectomy.[10]

Consequences of an anastomotic leakage include peritoneal contamination, surgical abscess, local recurrence, and higher postoperative mortality.[13]

We can improve the anastomosis success with a colonic irrigation/lavage or a mechanical/manual decompression, removing the content of the colon in contact with the anastomosis zone.[8]

1.2. Resection with colostomy or ileostomy (Hartmann's procedure)

The risks of a primary anastomosis in an obstructed colon are well known by colorectal surgeons,[14] not to mention that some high-risk patients cannot undergo a complex and demanding procedure, like the one mentioned above.

The famous Hartmann's method, a two-stage procedure, was developed as an alternative. Firstly, the tumor in occlusion is resected, a proximal colostomy is conducted and distal end closed. Weeks later, in a second surgery, the bowel is reconnected which results in a safer anastomosis.

It is the recommended treatment in high surgical risk patients but the need for a second surgery can be an obstacle and over half of the patients do not have conditions to reverse the stoma.[11,15] Actually, many studies show no significant difference in mortality and morbidity between one stage or Hartmann's procedure and defend that in the presence of an expert surgeon and a careful patient's selection, a single stage colectomy with primary anastomosis is the best choice.[4,14]

1.3. Ileostomy or colostomy without resection

In some cases, due to patient's comorbidities or instability or in rectal cancer it is not possible to resects the tumor, even with Hartmann's procedure.

The alternative is an emergency ileostomy or colostomy proximal to the tumor with exploratory laparotomy to evaluate the disease's extension. With this technique, we decompress the bowel, the first issue that needs to be addressed.

Tumor resection and intestinal reconstruction take place in a second and third stage.[11]

The evidence level for this procedure is low and this option should be avoided, especially in young and healthy patients.[11] About 10–24% cases have complications related to stoma placement,[14] up to 50% can be difficult to reverse[16] and it usually has a negative impact on psychosocial wellbeing of the patient.[17] Long hospital stays, multiple surgical interventions and the delay of tumor resection can compromise long-term survival.

The type of surgery varies according to intraoperative findings. It is not by chance that in most randomized clinical trials the choice is made by the surgeon and is not imposed any particular type. In a randomized control trial from China,[15] 24 patients were included in the open emergency surgery group and the type of surgery was decided by the surgeon. Overall 9 patients had a successful one-stage operation (38% clinical success), 2 developed an anastomotic leakage and require reoperation and 6 ended up with a permanent colostomy.

In subocclusion cases, some patients can be forwarded to an elective surgery where the peri and postoperative outcomes are more favorable and anastomosis leakage rates are lower.[18,19] Emergency surgery has a mortality rate of 20% and a prevalence of 24.1% surgical complications, including more probability of creating a non-functional ostomy, wound infection, intra-abdominal collections, suture dehiscence and intestinal volvulus.[20]

If the surgeon has clinical training in laparoscopic surgery, it is safe to perform resection surgery with this technique provided there is no abdominal distension and signs of perforation.[6] However, laparoscopic technique can be risky

and challenging in emergency setting and even trained surgeons often choose a laparotomic approach in an obstructed colon. The recommendations are not restrictive, prevailing the clinical judgment.

2. SEMS (Self-Expanding Metal Stent)

Initially, SEMS was destined for the one-third of colon cancer cases that have unresectable or metastatic tumors.[21] Before this endoscopic technique, terminally ill patients had to undergo a colostomy or ileostomy to relieve the occlusion. SEMS has a lower morbidity rate and similar efficacy compared with palliative surgery, avoiding unnecessary operations and providing a better quality of life.[16,22,23]

A randomized control trial from 2015[24] with a sample of 56 patients with unresectable metastatic spread tried to evaluate the effect of the two palliative procedures on patients well being and symptoms relief. The quality of life scores were superior in the group of patients with SEMS comparing with the group submitted to surgical decompression, particularly in the first weeks. However, abdominal pain and stool frequency affected particularly patients in the SEMS group.

In a terminal illness, several variables work as potential confounding biases when evaluating the quality of life and symptoms recurrence. Either SEMS or palliative surgery have a marked improvement in obstructive symptoms, therefore both methods are currently used as palliative procedures.[9,24]

Currently, there is a new discussion addressing the use of SEMS in malignant colonic obstructions as a bridge to surgery. SEMS is not curative taking in mind that the tumor is not removed, but it can relieve the obstruction and be an intermediate step in a curative treatment.[4]

This endoscopic technique has many advantages: gives us time to stage the disease, biopsy the tumor, resort to neoadjuvant therapy if necessary and prepare the patient for surgery. Following these pre-surgery procedures, it is safer to carry out a single-stage elective laparoscopic resection of the tumor or choose another treatment, avoiding an emergency surgery and the complications related to it.[14,25]

Geraghty 2014[26] showed that 82.7% of the patients undergoing SEMS as a temporary measure to relieve colonic occlusion did an elective surgery without any SEMS complications. However Fernández-Esparrach 2010,[16] in a smaller study, documented only 44% of success in patients undergoing SEMS. It is not the only case, many other authors failed to show beneficial effects with the use of SEMS.[27–30]

Colonoscopy must be performed in the first 12–24 h, immediately after patient's stabilization. It is a recent technique that requires an expert endoscopist.[31] But even with a trained and expert team, obstructions localized on a colonic curve or in the rectosigmoid junction remain challenging and are associated with more short-term complications. Outcomes are better when SEMS is used in a short colonic segment and in distal occlusions.[4]

SEMS is very efficient in relieving colonic obstructions, with technical and clinical success rates up to 94%.[16] Technical success is often defined as successful stent placement in the colonic obstruction, and clinical success is defined as a colonic decompression radiological documented with relief of symptoms and no complications.[20,32–34] Taking into account the risks of SEMS, it is imperative to guarantee its efficacy. Some trials showed a lower efficacy of SEMS as a bridge to surgery mainly because of complete and complex colonic occlusions and other patients' risks factors, proving that SEMS is effective only in selected patients.[30,35,36]

There is the possibility of performing an emergent surgical intervention if SEMS fail. Sharma 2014[6] suggests that endoscopic SEMS placement must be conducted in the operating room, where a surgeon can promptly intervene if SEMS fail in reliving the obstruction or if a colonic perforation occurs.

In the presence of perforation, sepsis or necrosis, SEMS is not an option and an urgent surgery is required.[4]

2.1. SEMS's complications

A large multicentre retrospective study resorts to a total of 334 patients who underwent SEMS placement to relieve colonic occlusion in five different university teaching hospitals in England. They reported colon perforation rates of 2.7%, immediate migration of 2.1% and tumor overgrow of 7.5%. Of the 334 patients, SEMS was the definitive procedure in 225. In the group that went SEMS as a bridge to surgery, 17.3% patients have a SEMS failure before elective surgery with 11.5% requiring an emergency surgery.[26]

They also documented superior technical and clinical success when SEMS was implemented by experienced endoscopists that had already done more than 10 procedures, however, this fact did not influence significantly the complication rates.[26]

There are many types of stents of different sizes and coatings. The noncovered stents have less migration rate, less probability of failure and fracture and are easier to place. Nevertheless, the coat itself prevent the tumor proliferation inside of the stent and it is important to ensure colon patency.[22]

If the tumor begins to decrease, for example in response to chemotherapy, there is a higher chance of stent migration or perforation. Although we should be very careful when giving some agents of chemotherapy, like bevacizumab, in patients with SEMS due to reports of perforation and late complications with this association.[22,27]

A Dutch multicenter randomized trial that was canceled in 2010 is referred in several reviews. Unexpected complications on SEMS group, including 13% of colonic perforations, a big rate of technical failure and an absolute risk increase of 0.19 were the cause of its discontinuance. These complications were apparently related to the type of stent used and the risk of complications inherent to the selected population.[30]

a) Bowel perforation

Bowel perforation is a serious complication with an incidence of 6.9% and every physician must consider it when thinking about using SEMS in a colonic obstruction.[37] It is possible that this number is underestimated due to silent perforations only detected in a colonoscopy or in an anatomopathological exam.

Although many papers argue that the rates of perforation are not excessively high, the numbers are fearsom due to its severe consequences: peritoneal infection, tumor spread and death. Colonic perforation can convert a curable disease to incurable.[30]

In Fernández-Esparrach 2010,[16] all three patients whose SEMS cause colonic perforation died in consequence of this complication.

In Van Hooft 2011 canceled trial[30] there were a total of 20% colon perforations, including a significant number of silent perforations.

It is possible that patients with high probability of perforation also manifest high grade lesions, high degree of obstruction and more tumor necrosis.[38]

b) Tumor seeding

With growing popularity of SEMS, its new dimensions and utilities, oncologic safety issues begin to be a concern.

Three important questions we try to answer with our research is if SEMS approach to colonic cancer occlusion can cause spread of malignant cells and if so, what is the mechanism behind that and how that affects oncological prognosis.

Cancer-related cells can be detected in blood samples a few days after SEMS placement.[39] The risk of tumor cells invasion is probably related to endoluminal manipulation during the insertion of SEMS or with mechanical cellular and tumor damage during its expansion. Tumoral tissue damage continues after SEMS expansion for many days.[33,39]

Furthermore, colon perforation and dilatation, two possible complications of SEMS, can spread tumor cells to peritoneum, vascular system and lymph vessels.

In the canceled Dutch trial, 5 of the 6 patients that have developed stent-related perforations had disease recurrence, compared with 8 of the 20 patients without stent-related perforations.[30] A multivariate analysis identified perforation in SEMS group as an independent risk factor for cancer recurrence and seeded metastasis.[38] In cases with high technical and clinical success rates and no register of perforations, including microscopical perforations, the oncological outcomes tend to be better.[32]

Sabbagh 2013[40] compared pathological tumor characteristics after SEMS insertion with the emergency surgery group and detected a higher rate of tumor ulceration (96% vs. 60%, $p < 0.0001$), perineural (60% vs. 20%, $p = 0.008$), and lymph node invasion (52% vs. 12%, $p = 0.005$) in SEMS group. These pathological findings may have a negative impact in overall survival, although that was not evaluated in this study. Furthermore, tumor size and T4 stage also influenced microperforation, perineural, and lymph invasion.

Kim 2013,[27] concluded that the use of SEMS is oncologically safe, with 5 year overall survival rates comparable between the group that underwent laparoscopic resection after successful colonic stenting and the group that did an open lavage and a primary anastomosis. Even though the first group experienced a higher perineural invasion, that did not translate into obvious clinical oncological outcomes. Perineural invasion may occur due to the pressure exerted by SEMS in the colon wall, allowing tumor cells overflow to perineural space.[19,39]

Maruthachalam 2007[41] is one of the few articles that try to determine if the use of SEMS in obstructed colon cancer can lead to dissemination of malignant particles. They measured the serum levels of two tumor markers, carcinoembryonic antigen messenger RNA (CEA mRNA) and cytokeratin 20 messenger RNA (CK20 mRNA), by collecting peripheral blood samples before and after SEMS insertion (in palliative setting and as a bridge to surgery) and staging colonoscopy. The levels of CK20 mRNA were significantly higher after SEMS placement, including in two patients with no detectable CK20 mRNA before the procedure. Patients undergoing only staging colonoscopy, without SEMS insertion, did not register a significant rise in CK20 mRNA levels. This strongly suggests that tumor expansion with SEMS and its possible complications may induce shedding of tumor cells into circulation.

Circulating tumor DNA (ctDNA) was analyzed in 25 patients who underwent SEMS for colonic tumor decompression by Takahashi 2017.[33] This indicator of apoptosis and necrosis of cancer cells was significantly increased 3 days after SEMS placement compared to the values before SEMS placement (day 0–0.40 copies/mL; day 3–214 copies/mL; $p = 0.003$). The Circulating Cell-Free DNA (cfDNA), an indicator of cell damage (normal cells and cancer cells), was also measured and registered a significant increase in day 7 (day 0–0.532 copies/mL; day 7–992 copies/mL; $p = 0.005$).

Yamashita 2018[39] evaluated viable Circulating Tumor Cells (CTCs), instead of tumor cell particles, before and after SEMS placement. Although there were no significant differences, an increase in CTCs after SEMS insertion was detected in two of four patients with previously detectable CTCs and in two of four patients with no record of CTCs. This study also shows a decrease in CTCs after resection surgery, suggesting that the risk of tumor dissemination can be eliminated when SEMS is used in a bridge to surgery approach.

The time between SEMS placement and resection surgery may influence the oncological outcome. In Broholm 2017,[42] median time between SEMS insertion and surgery in 92 patients with potentially curable disease was 18 days. Overall, recurrence rate was notably high (about 37%) and the risk of local and distant recurrence was higher in the group of patients that waited more than 18 days between SEMS and surgery (OR 5.1 [1.6–15.8], $p = 0.005$). In randomized controlled trials, elective surgery was scheduled closer to the day of SEMS placement, avoiding this bias.[18,35,43] Nonetheless, a few days are often necessary to stabilize the patient and reduce the risk of anastomotic leakage.

c) Re-obstruction and stent migration

Tumor ingrowth can imply a second SEMS placement in 10–19% of the patients, specifically in the palliative setting where SEMS stays months inside the patient.[9,20] The mean time to tumor in growth is 115 days.[44] If resection surgery is performed one to two weeks after SEMS placement, stent obstruction rates are lower, around 2.1%.[26,45]

The prevalence of stent migration (2–3%) is similar to perforation risk, being the most frequent complication in some series.[26,45]

3. Surgery vs. SEMS

3.1. Stoma formation, surgical and hospitalization parameters

There are many misunderstandings regarding stoma formation in patients treated with curative intent.

Emergency surgery is known to have a high risk of stoma creation due to anastomotic leakage, bad colonic preparation,

and clinical instability of the patient.[34] Many authors instigate the avoidance of stoma creation as the major advantage of SEMS, especially in palliative setting.[20,23,24,44] However, it is not clear if using SEMS as a bridge to surgery has less definitive stoma formation.

Pirlet 2011,[35] had the main goal of study stoma formation in SEMS as a bridge to surgery. They could not prove any benefits in this field compared with surgery group. Relevant adverse events and technical failure in SEMS group were the origin of many emergency interventions and less primary resection rates. Cheung 2009,[15] has a very similar design protocol and none of the patients in the SEMS group ended up with a permanent stoma. Endo-laparoscopic resection and anastomosis rates were fairly higher in this study.

Hospitalization's details mostly benefit the SEMS group, having in mind that elective surgery is performed in this group. However, the overall days of hospitalization do not differ significantly.[18,43,45]

Two systematic reviews and meta-analysis, one with four randomized controlled trials, showed significative successful primary anastomosis in SEMS group. Hospital mortality, anastomotic leak, surgical infection, and thirty-days reoperation rates were not significantly different.[13,37]

3.2. *Survival rates*

Long-term survival outcomes are the most important subject of study when debating a new oncological treatment. Factors that can independently predict overall survival are cancer stage, adjuvant chemotherapy, tumor differentiation, and the presence of concomitant comorbidities.[46]

A comparative study with a propensity score analysis that tries to mimic a randomized clinical trial, registered a 5 year overall survival (25% vs. 62%, $p<0.001$) and 5 year cancer-specific mortality (48% vs. 21%, $p=0.02$) significantly lower in the SEMS group compared with the surgery only group, even if the analysis is restricted to metastasis and perforation free patients.[29] However, a recent similar study with a larger sample (a total of 335 patients treated with curative intent) detected no significant differences in long-term oncologic outcomes between SEMS and emergency surgery.[19]

In palliative setting, Lee 2012,[44] registered a statistical difference in overall survival and patients who were submitted to SEMS placement had a median overall survival of 7.6 months while patients in the only-surgery group had an overall survival of 15.9 months ($p=0.002$). However, SEMS group had a higher ASA score and more advanced disease, and, in the surgery group, some patients were submitted to resection of the tumor, which could explain differences in survival rate.

Discussion

So, how do physicians choose? There is not a right answer. Localization of the tumor, cancer stage, the general condition of the patient, experience, and resources of the medical team are factors to take in mind to guarantee a patient personalized approach.

Although in the past, second or third-stage surgeries were frequently performed, nowadays, whenever possible, and in line with the most recent recommendations, the one-stage procedure should be preferred, especially for patients with hemodynamic stability and good anesthetic risk.

There is no denying the surgical risks and the high probability of ending with a stoma. It is an emergency surgery frequently with no bowel preparation. But the truth is that only surgery can ensure a complete resolution and resection of the tumor.

In the last few years, clinical trials and reviews testing the uses of SEMS in colorectal cancer have increased. It is a favorable and popular alternative to emergency surgery with big success on initial decompression of the colon.

Regarding the use of SEMS, most trials show excellent short-term results, with relief of the symptoms and quick restoration of bowel function. Nevertheless, there was not a huge decrease in mortality, like it was perhaps expected, and there is a lack of strong evidence of clinical benefit. Failure can occur in up to 50% of cases in 2.5 months[16] and the rate of complications can reach 25%.[37] More data is needed to verify its long-term advantages.

During the last decades, studies carried out on malignant colonic obstruction were mostly comparative studies, including some randomized controlled trials. The discrepant results between studies are evident and prevailed throughout our bibliographic research. Some advocate the negative impact of SEMS as a bridge to surgery, and others support an acceptable oncologic outcome.

Most of the proposed patients for SEMS are terminally ill patients or have several comorbidities which make difficult to properly evaluate survival rates.

Randomized trials may be no ethical to perform due to efficacy issues and many times emergency surgery is imperative in colonic cancer occlusion.

There is an important obstacle regarding the technique and the expertise that it requires. This procedure should be done in trained and specialized centers to minimize the risk of complications. SEMS has more late complications, whereas emergency surgery morbidity is often more immediate.

Different types of stents are being studied and developed to minimize the complications and optimize technical success.

The research presented focus on the oncological issues that surround SEMS. Shear forces acting on the tumor during the endoscopic insertion, self-expansion or during the time SEMS stay in the colon can lead to peritoneal and hematogenous tumor dissemination. It is still unproven if tumor cell spread influences the oncological outcome but this possibility cannot be ignored, especially in patients who are candidates to curative treatment.

Several clinical trials that reported bad outcomes in patients submitted to SEMS as a bridge to surgery recommend caution when opting for this approach, preferring immediate resection surgery if the patient is a good surgical candidate. The canceled clinical trials related to SEMS's deleterious effects sparked the debate.

Further studies with longer follow-ups are necessary to evaluate SEMS's complications and their impact in mortality and morbidity rates.

Conclusion

Emergency surgery in colon cancer occlusion has high mortality and colostomy reports. On the other hand, SEMS can result in colon perforation and tumor cell spread. The risks have to be balanced with the benefits.

The recommendations to date advocate that surgery still is the standard therapy and the use of SEMS should be reserved to selected patients with short-term life expectancy or high surgical risk. These indications may change in the next years. Long-term risks of SEMS and the potential tumor dissemination are a serious concern and more studies must be conducted to clarify its oncological safety.

Conflicts of interest

The authors declare no conflicts of interest.

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