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Colonic Stenting In Malignant Obstruction: A Bridge, A Risk, Or A Choice? A Clinical Critique Of The Crest Trial.

Mughal M, Saldanha J, Stewart B, Paraicz D
Department Of General Surgery, University Hospital Hairmyres, Eaglesham Road, East Kilbride, G75 8RG
Department Of General Surgery, Whipps Cross Hospital, Whipps Cross Rd, E11 1NR London

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I. Introduction

The CREST (Colonic Stenting Trial) represents a pivotal study in the surgical field, focusing on the optimal management of malignant large bowel obstruction. This trial aims to compare the effectiveness and safety of colonic stenting as a bridge to surgery versus emergency surgery alone. Here, we present a detailed critique of the CREST trial, examining its design, methodology, and broader implications for clinical practice.

II. Key Findings And Implications

Findings:

1. Stoma Formation: Stenting significantly reduced stoma formation compared to emergency surgery (47.5% vs. 67.9%; P = 0.003). **[1]**
2. Hospital Stay and Mortality: There were no significant differences in 30-day postoperative mortality (3.6% vs. 5.6%; P = 0.48) or duration of hospital stay (median 19 vs. 18 days; P = 0.94) between the two groups. **[1]**
3. Long-term Outcomes: No significant differences were observed in perioperative morbidity, quality of life, 3-year recurrence, or mortality between the treatment groups. **[1]**

The Colorectal Endoscopic Stenting Trial (CReST) aimed to evaluate the efficacy and safety of colonic stenting as a bridge to surgery compared to emergency surgery in patients with obstructing left-sided colorectal cancer.

Colonic stenting has no decisive clinical advantages over emergency surgery. It could be used as an alternative treatment in as-yet undefined subsets of patients, although with caution because of concerns about tumour spread caused by perforations.

Methodological Considerations

The trial randomised 245 patients from 39 hospitals to either endoluminal stenting followed by elective surgery or immediate surgical decompression.

Randomised controlled design:

Patients with left-sided colonic obstruction and radiological evidence of carcinoma were randomised to either endoluminal stenting (as a bridge to elective surgery 1–4 weeks later) or emergency surgical decompression (with or without tumour resection). Randomisation was performed centrally using a minimisation procedure, stratified by curative intent, primary tumour site, and severity score (APACHE) to ensure balanced allocation across prognostic factors. [1]

- **Intention-to-treat analysis:** All analyses were conducted on an intention-to-treat basis, preserving the benefits of randomisation and minimising bias from post-randomisation exclusions. [1]
- **Co-primary and secondary outcomes:** The co-primary outcomes were duration of hospital stay and 30-day mortality. Secondary outcomes included stoma formation, stenting completion and complication rates, perioperative morbidity, 6-month survival, 3-year recurrence, resource use, adherence to chemotherapy, and quality of life. [1]
- **Multicentre approach:** The trial was conducted across 39 hospitals, enhancing generalisability and external validity. [1]
- **Eligibility and technical considerations:** Only patients with radiologically confirmed left-sided malignant obstruction were included. Stenting was performed using a combined endoscopic/fluoroscopic technique, and technical success and complications were systematically recorded. [1]
- **Follow-up and outcome assessment**: Outcomes were assessed at multiple time points, including perioperative, 6-month, and 3-year intervals, to capture both short- and long-term effects. [1]

These methodological features ensured a robust comparison of stenting versus emergency surgery in this clinical context, with careful attention to randomisation, outcome selection, and follow-up.

Inclusion Criteria:
• Patients with left-sided colonic obstruction.
• Radiological features suggestive of carcinoma.
• Patients were eligible if they required urgent decompression due to the obstruction.

Exclusion Criteria:
• Patients with perforation or peritonitis.
• Patients with rectal tumours located less than 5 cm from the anal verge.
• Patients with synchronous metastatic disease that was not amenable to curative resection.
• Patients who were unfit for surgery or endoscopic procedures due to severe comorbidities.

III. Strengths And Limitations

Strengths:
1. Randomised Design**:** The trial's randomised design enhances the reliability of the results by minimising selection bias.
2. Comprehensive Outcome Measures**:** The study assessed a wide range of outcomes, including hospital stay duration, 30-day mortality, stoma formation, perioperative morbidity, and long-term survival, providing a thorough evaluation of both short-term and long-term effects.
3. Large Sample Size**:** With 245 patients, the sample size is substantial, allowing for more robust statistical analysis.

Limitations:
1. Technical Success Rate: The technical success rate of stenting was 82.4%, indicating that the procedure was not successful in a significant proportion of patients. This raises concerns about the reliability and consistency of the stenting procedure. [1]
2. Variability in Expertise: The trial was conducted across 39 hospitals, which may introduce variability in procedural expertise and patient management. This heterogeneity can affect the generalisability of the results. [1]
3. Perforation Risk: Although not explicitly highlighted in the CReST trial, colonic stenting is associated with a risk of perforation, which can lead to serious complications. This risk is supported by other studies, which reported perforation rates ranging from 3.7% to 4.5%. [2]
4. Short Follow-up Duration: While the trial included long-term follow-up, further extended follow-up could provide more insights into the long-term oncological outcomes and potential late complications of stenting. [1]
5. Patient Selection: The trial included patients with varying degrees of obstruction severity and different tumour sites, which might have influenced the outcomes. More stringent inclusion criteria could help in better understanding the efficacy of stenting in specific patient subgroups. [1]
6. Complication Rates: The trial did not show significant differences in perioperative morbidity between the stenting and surgery groups, but other studies have reported higher complication rates with stenting, including stent migration and occlusion. [2-3]

IV. Discussion:

The concept of self-expandable metal stent (SEMS) insertion as a “bridge to surgery”, which converts an emergency to an elective one, is appealing. Besides colonic decompression, SEMS insertion allows for preoperative bowel preparation and makes elective single-stage colonic resection possible with decreased risk of permanent stoma creation. The trial analysed various outcomes, including perioperative morbidity, and found no significant differences between the stenting and emergency surgery groups across different patient subgroups stratified by curative intent, primary tumour site, and severity score (Acute Physiology And Chronic Health Evaluation). [1] Additionally, the trial did not report subgroup-specific differences in complications such as perforation, stent migration, or stent occlusion. This suggests that the complication rates were consistent across the different patient subgroups included in the study.

The CReST Trial evaluated long-term outcomes for different patient subgroups based on curative intent, primary tumour site, and severity score.

Curative Intent:

For patients treated with curative intent, there were no significant differences in 3-year recurrence or mortality between the stenting and emergency surgery groups. This suggests that colonic stenting as a bridge to

surgery does not adversely affect long-term oncological outcomes in patients undergoing potentially curative treatment. [1]

Primary Tumour Site:

The trial did not report significant differences in long-term outcomes based on the primary tumour site. However, subgroup analyses in other studies have indicated that the location of the tumour (e.g., descending colon) may influence specific outcomes like time to progression, but these findings were not explicitly detailed in the CReST trial. [1-2]

Severity Score (APACHE):

The CReST trial stratified patients by severity score using the Acute Physiology And Chronic Health Evaluation (APACHE) system. The trial found no significant differences in long-term outcomes, including 3-year recurrence and mortality, between the stenting and emergency surgery groups when stratified by APACHE score. [1] The question is again asked about long-term follow-up.

This trial did not report detailed survival rates specifically stratified by different stages of disease (e.g., Stage II, III, or IV). Therefore, while the overall findings indicate comparable survival outcomes between the stenting and emergency surgery groups, specific survival rates by disease stage were not provided in the CReST trial data. [1]

Complications:

1. **Perforation**: This is a significant complication associated with colonic stenting. The CReST trial reported perforation rates consistent with other studies, which have shown perforation rates ranging from 3.7% to 4.5%. **[1-3]**
2. **Stent Migration**: Stent migration was another common complication, with rates reported between 9.8% and 11.8% in pooled analyses of similar studies. The CReST trial also noted this issue, although specific rates were not detailed in the trial's primary publication. **[1-3]** The author personally encountered cases where the stent had migrated to the right side, in some instances reaching as far as the caecum.
3. **Stent Occlusion**: Stent occlusion, due to either tumour ingrowth or overgrowth, was observed, with rates ranging from 7.3% to 12% in pooled analyses. This complication can lead to recurrent obstruction and necessitate further intervention. **[1-3]**
4. **Technical Failures**: The CReST trial reported a technical success rate of 82.4%, indicating that in approximately 17.6% of cases, the stenting procedure was not successful in relieving the obstruction. **[2-3]**

These complications highlight the need for careful patient selection and procedural expertise when considering colonic stenting as a bridge to surgery.

In a meta-analysis, Ye GY et al. concluded that the SEMS as a bridge to surgery for obstructed left-sided colon cancer decreased the incidence of primary stoma rates and anastomotic leakage. But the consequence. Stenting vs surgery for left-sided colonic obstruction failed to show the effect on mortality and complications related to surgery. (4) Therefore, "preoperative SEMS can be used as an alternative approach for emergent surgery but should be used with caution, mainly because of concerns of overt and silent perforations." Future studies are needed to further investigate the oncological outcomes and establish whether specific groups of patients could benefit more from either colonic stenting or emergent surgery.

Most importantly, the CReST trial demonstrated that colonic stenting as a bridge to surgery reduces stoma formation without detrimental effects on short-term and long-term outcomes compared to emergency surgery. However, the technical success rate and variability in procedural expertise are important considerations for clinical practice. Although colorectal SEMS placement is safe and effective overall, it involves technical and clinical failure rates that should not be ignored. (1-3)

In previous randomised controlled trials, SEMS insertion showed favourable short-term outcomes with lower morbidity and permanent stoma rates [7–11]. However, the long-term oncologic outcomes in patients with curable diseases are unclear. Shear forces induced by the SEMS could lead to dissemination of cancer cells into the peritoneal cavity, lymphatic fluid, and bloodstream [12, 13]. A few studies reported poor oncologic outcomes in patients who underwent SEMS insertion, especially in those with SEMS-related perforation [14, 15]. A Japanese nationwide study also reported significantly poorer overall survival (OS) rates in patients who underwent SEMS as a bridge to surgery than emergency surgery [16]. In contrast, many studies reported high success rates and comparable oncologic outcomes for SEMS insertion [17].

Because of these inconsistent findings, additional research is needed on SEMS insertion as a bridge to surgery in patients with left-sided malignant large bowel obstruction. Colonic stenting should be considered a viable option for patients who are strongly averse to stoma formation, provided that the necessary expertise and equipment for safe stent placement are immediately available. However, delaying intervention for several days

to arrange for stenting—rather than proceeding with timely surgery—may not be in the best interest of the patient. Furthermore, a 2023 study demonstrated that delays beyond 17 days post-stenting were associated with increased stoma formation and poorer survival outcomes, with an optimal surgical window of 11–17 days. [18]

The CREST study, although a great study in itself and having opened a new door in managing such patients, cannot be taken as a protocol for the left-sided malignant obstructions. In actual fact all the patients need to be carefully assessed, and treatment should be tailor-made. One size cannot fit all; after all, we are talking here about oncological outcomes, and if we have failed to give a long-term disease-free survival (I am talking about more than five years), then we have not done any good to the patient by not giving him a stoma.

Conflict of interest: None

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