



Contents lists available at ScienceDirect

International Journal of Surgery Case Reports

journal homepage: www.casereports.com

Case report: Total enterectomy following complete small bowel ischaemia in the post-peritonectomy setting

A. Coulshed^{a,b}, M. Soucisse^{a,b}, J.D. Lansom^{a,b}, D. Morris^{a,b,*}^a Department of Surgery, St George Hospital, L3 Pitney Building, Short Street, Kogarah, NSW, 2217, Australia^b St George & Sutherland Clinical School, University of New South Wales, Australia

ARTICLE INFO

Article history:

Received 21 July 2020

Received in revised form

17 September 2020

Accepted 18 September 2020

Available online 23 September 2020

Keywords:

Total enterectomy

Peritonectomy

Small bowel transplant

ABSTRACT

INTRODUCTION: This report presents the rare case of a patient with complete bowel ischaemia following parastomal hernia, leading to total bowel resection, with consideration of post-operative complications and wound management.

PRESENTATION OF CASE: A 59 year old female was found to have complete small bowel ischaemia on exploratory laparotomy, on a background of recurrent appendiceal adenomucinosi, for which she had received previous peritonectomy, cholecystectomy, total colectomy, and partial small bowel resection. The patient was managed with total enterectomy and post-operative total parenteral nutrition.

DISCUSSION: Total enterectomy represents a significant challenge in the postperitonectomy setting, including consideration of wound management with the empty abdomen, and the potential of small bowel transplant in management.

CONCLUSION: Resection of the small bowel following total small bowel ischaemia is feasible in the post-peritonectomy setting, given appropriate post-operative care and wound management. However, long-term survival remains challenging, especially without small bowel transplant.

© 2020 The Authors. Published by Elsevier Ltd on behalf of IJS Publishing Group Ltd. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

1. Introduction

Recent studies have examined the post-surgical courses of patients with total or near-total enterectomy, including considerations of monitoring, survival benefit and quality of life [1,2]. However, there remains a paucity of data surrounding post-operative management of total enterectomy patients, especially in the post-peritonectomy setting. Consequently, this report outlines a rare case of complete bowel ischaemia following parastomal hernia in a post-peritonectomy patient, leading to total enterectomy. This is reported using SCARE guidelines [3]. Through this, it discusses the challenges of long-term management, including considerations of wound management and small bowel transplant.

2. Presentation of case

A 59-year-old female was transferred to our institute with ongoing severe abdominal pain and distension. This was on a background of multiple peritonectomies for recurrent disseminated peritoneal adenomucinosi, including cholecystectomy, total colectomy, and partial small bowel resection, and multiple sub-

sequent laparotomies for adhesiolysis. Her medication history included regular anti-emetics, opioid analgesia, beta-blockers and anti-depressants. Her family history was insignificant, and her psychosocial history was significant for smoking.

Upon assessment, she was found to have severe abdominal distension and tenderness without peritonism, and a black stoma, consistent with her delayed presentation to hospital. CT scan showed an obstructed parastomal hernia causing ischaemia of the ileostomy, alongside venous blood results demonstrating worsening lactic acidosis (pH 7.156, Lactate 3.4).

Consequently, she was sent to operative theatre emergently. Initial incision around the stoma revealed dead small bowel, and the procedure was converted to laparotomy. Laparotomy revealed small bowel completely dilated to the ileostomy, with a parastomal hernia. Extensive adhesiolysis revealed almost all of the small bowel was ischaemic and malodorous, but there was no evidence of disease recurrence. Surgery was performed by a senior surgeon with 25 years of experience in peritonectomy, having performed approximately 1500 peritonectomy cases.

Consequently, after a discussion with the patient's family concerning limits and goals of care, the entire small bowel was resected, leaving the proximal jejunum stapled off. A tube gastrostomy was also performed. The abdomen was closed with 2 × 24F Blake drains, then skin and fascia closed with 2 mersilk interrupted sutures. Histopathological examination later confirmed that the entire small bowel was necrotic.

* Corresponding author at: Department of Surgery, St George Hospital, L3 Pitney Building, Short Street, Kogarah, NSW, 2217, Australia.

E-mail address: david.morris@unsw.edu.au (D. Morris).

<https://doi.org/10.1016/j.ijscr.2020.09.127>

2210-2612/© 2020 The Authors. Published by Elsevier Ltd on behalf of IJS Publishing Group Ltd. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).



Fig. 1. Complete wound dehiscence.

Following the initial surgery, the patient experienced an extended admission to hospital with multiple surgical revisions due to a number of complications. Notably, the patient experienced complete wound dehiscence (Fig. 1) at 24 days post admission. On return to theatre, a suture line dehiscence was noted, with bile coming out of the enterotomy in the left upper quadrant. This was consequently managed with a negative pressure dressing, in order to protect the skin from further contact with bile (Fig. 2). Regular VAC dressing changes occurred throughout her admission.

Subsequently, at 78 days post admission, a partial split skin graft was conducted. Using a donor site from the right inner thigh, the graft was applied to the granulating retroperitoneum (Fig. 3) and secured with staples, with an overlying VAC dressing.

During the patient's admission, nutrition was maintained with total parenteral nutrition (TPN). Fluid balance was monitored considering inputs of IV crystalloid fluids, TPN and oral intake, and output from the negative pressure dressing, urine and fistula. Interventions were tolerated during admission. The patient described realistic ongoing anxieties regarding prognosis and function, and was managed accordingly under consultant liaison psychiatry.

The patient was discharged 100 days after admission, following home TPN training. Following discharge, the skin graft partially took, accelerating healing of her abdominal wound. Unfortunately, this was followed by readmission 48 days later for worsening dehydration, electrolyte imbalance, metabolic alkalosis and cholestasis whilst on home TPN, with high stoma output. Given the increasing complexity of her care and worsening quality of life, following discussion regarding limitations of care, the patient elected to pursue comfort care. Consequently, the patient passed away 152 days after initial presentation.

3. Discussion

Within the complex management of the presented case, two key issues are evident; Long-term medical care following total enteroc-



Fig. 2. Abdominal dressing allowing isolation of the open abdomen and the gastrostomy.



Fig. 3. Complete granulation of the retroperitoneum ready for skin grafting.

tomy in the post-peritonectomy setting, and wound management for the open abdomen.

Long-term management represented the major challenge in the presented case. Given the patient's initial presentation of parastomal hernia, total small bowel resection was an unexpected finding on laparotomy. Subsequently, whilst initial bowel resection was completed successfully, long-term TPN contributed significantly to her metabolic complications and worsening quality of life. Consequently, this case represents an example of someone who could have potentially benefited from small bowel transplant services in Australia. Recent developments in small intestine and multi-visceral transplant represent an exciting management strategy following total enterectomy, with good outcomes in survival and quality of life [4]. However, opportunity for these transplants in Australia remains limited, and data surrounding intestine transplant lags behind other transplants [5]. Early studies have shown that multi-visceral transplantation including small bowel is feasible in appendiceal adenomucinoses patients, and provides notable improvements in survival and quality of life [6,7]. These findings are consistent with broader studies supporting small bowel transplant as a means to wean patients off TPN and tube feeding, and thus potentially avoid the complications presented in this case [8,9].

Regarding wound management, negative pressure therapy is a well-recognised method of managing the open abdomen, assisting in haemostasis, prevention of fascial contracture, reduction of visceral oedema, maintenance of tissue perfusion and protection of abdominal contents [10,11]. However, there is a lack of consensus among surgeons for optimal management of the open abdomen [12,13]. Additionally, some studies have noted intestinal leakage following negative pressure dressing [14] and delayed wound closure [10]. Considering the presented case, there is a paucity of data surrounding management of the open abdomen following peritonectomy or total enterectomy. Consequently, notable findings of this case include the benefit of negative pressure dressing as a short-term measure to manage the open empty abdomen for maintaining fluid balance and wound protection, even in the presence of an enterotomy. In fact, in the presented case, the negative pressure dressing counterintuitively helped promote healing around the fistula and allowed it to heal. Furthermore, a skin graft is a potential technique for accelerating wound healing.

Finally, of further note is this patient's delayed presentation to hospital with late-stage complications of parastomal hernia and bowel ischaemia. Both in our institute's experience and recent publications, revision surgeries in patients with previous peritonectomy are feasible and of benefit to patients' survival [15,16]. Consequently, this case highlights the importance of encouraging early contact with health services amongst patients who have previously undergone peritonectomy, to facilitate timely surgical interventions.

4. Conclusion

The presented case demonstrates that resection of the entire small bowel following total small bowel ischemia is feasible in the post-peritonectomy setting. However, the benefits appear to be short-lived in the absence of a long-term management solution, such as small bowel transplant. Electrolyte imbalances and premature liver failure appear to limit the benefits of home TPN in total enterectomy. Further investigation into lasting management options is necessary to improve long-term patient outcomes.

Funding

N/A.

Ethical approval

Written consent has been obtained from the patient's next of kin according to journal guidelines. Beyond this, ethical approval was not considered necessary, given this is a case report involving a single patient.

Consent

Written consent obtained from next of kin, using IJSCR template.

Author contribution

Andrew Coulshed – writing of manuscript, literature review.
Mikael Soucisse – case interpretation and revision of manuscript.
Joshua Lansom – case interpretation and revision of manuscript.
David Morris – case interpretation and revision of manuscript.

Registration of research studies

1. Name of the registry: N/A.
2. Unique identifying number or registration ID: N/A.
3. Hyperlink to your specific registration (must be publicly accessible and will be checked): N/A.

Guarantor

Corresponding Author: Prof. David Morris.

Provenance and peer review

Not commissioned, externally peer-reviewed.

Declaration of Competing Interest

The authors report no declarations of interest.

References

- [1] R.J. Cruz, et al., Surgical and medical approach to patients requiring total small bowel resection: managing the "no gut syndrome", *Surgery* 162 (4) (2017) 871–879.
- [2] S. Huerta, et al., No gut syndrome: near total enterectomy, *J. Gastrointest. Surg.* 19 (5) (2015) 973–980.
- [3] R.A. Agha, et al., The SCARE 2018 statement: updating consensus Surgical Case Report (SCARE) guidelines, *Int. J. Surg. (Lond. Engl.)* 60 (2018) 132–136.
- [4] K.M. Abu-Elmagd, et al., Long-term survival, nutritional autonomy, and quality of life after intestinal and multivisceral transplantation, *Ann. Surg.* 256 (3) (2012) 494–508.
- [5] D. Sudan, The current state of intestine transplantation: indications, techniques, outcomes and challenges, *Am. J. Transplant.* 14 (9) (2014) 1976–1984.
- [6] P. Allan, et al., PTU-105 cytoreductive surgery and small bowel transplantation is a feasible option for patients with end-stage pseudomyxoma peritonei, *Gut* 65 (2016).
- [7] S. Reddy, et al., Extending the indications of intestinal transplantation—modified multivisceral transplantation for end-stage pseudomyxoma peritonei, *Transplantation* 101 (6S2) (2017) S89.
- [8] S.J.D. O'Keefe, et al., Nutrition and quality of life following small intestinal transplantation, *Off. J. Am. Coll. Gastroenterol. ACG* 102 (5) (2007).
- [9] S. Bharadwaj, et al., Current status of intestinal and multivisceral transplantation, *Gastroenterol. Rep.* 5 (1) (2017) 20–28.
- [10] G.L. Carlson, et al., Management of the open abdomen: a national study of clinical outcome and safety of negative pressure wound therapy, *Ann. Surg.* 257 (6) (2013) 1154–1159.
- [11] P. Navsaria, et al., Negative pressure wound therapy management of the open abdomen following trauma: a prospective study and systematic review, *World J. Emerg. Surg.* 8 (1) (2013) 4.
- [12] A.A. MacLean, T. O'Keefe, J. Augenstein, Management strategies for the open abdomen: survey of the American Association for the Surgery of Trauma membership, *Acta Chir. Belg.* 108 (2) (2008) 212–218.

- [13] J.L. Regner, L. Kobayashi, R. Coimbra, Surgical strategies for management of the open abdomen, *World J. Surg.* 36 (3) (2012) 497–510.
- [14] M. Rao, et al., The use of vacuum-assisted closure of abdominal wounds: a word of caution, *Colorectal Dis.* 9 (3) (2007) 266–268.
- [15] Y. Huang, et al., Repeat cytoreductive surgery with or without perioperative intraperitoneal chemotherapy for peritoneal surface malignancy, *Am. J. Surg.* 213 (2016).
- [16] J. Karpes, et al., Analysis of feasibility and survival in repeated cytoreductive surgery and hyperthermic intraperitoneal chemotherapy (CRS/HIPEC) in appendiceal cancer with peritoneal dissemination, *J. Clin. Oncol.* 37 (2019), e15702-e15702.

Open Access

This article is published Open Access at [sciencedirect.com](https://www.sciencedirect.com). It is distributed under the [IJSCR Supplemental terms and conditions](#), which permits unrestricted non commercial use, distribution, and reproduction in any medium, provided the original authors and source are credited.