

Fistuloclysis – a valuable option for a difficult problem

S. PEER, M.B. B.CH.

M. S. MOODLEY, F.C.S. (S.A.)

H. M. CASSIMJEE, F.C.S. (S.A.)

B. SINGH, F.C.S. (S.A.), M.D.

Department of Surgery, Nelson R Mandela School of Medicine, University of KwaZulu-Natal, Durban

Despite the great advances in the management of high-output enterocutaneous fistulas (HOECFs), this condition remains a challenge for surgeons in both the developing and developed worlds. Since the early 1960s, nutritional support has been the mainstay of management that expedites the spontaneous healing of the fistula or, if healing does not occur, ensures that the patient is nutritionally optimised for surgical reconstruction.¹⁻⁵

In most practices, the rapid and considerable metabolic and nutritional deficits that follow the development of a HOECF prompt the parenteral delivery of nutritional support, invariably via a central vein; however, enteral nutritional support alone has been reported to be equally effective in selective clinical situations.⁶

The difficulty in delivering nutritional support because of access problems, high-output proximal enterocutaneous fistula or proximal enteric obstruction presents a clinical challenge. In such situations (as evident in this report), fistuloclysis (the delivery of nutrition via the fistula along the distal small bowel) is an attractive option.⁶

Case report

The patient, a 33-year-old woman without previous comorbidity, had undergone laparotomy for pelvic peritonitis. At surgery, a right tubo-ovarian inflammatory mass was removed. On day 6 after surgery, the patient developed acute intestinal obstruction that warranted a re-laparotomy; adhesiolysis was performed and a Bogota bag applied.

A HOECF (daily output 1 500 ml) was diagnosed on day 5 after re-laparotomy. At this stage, the patient was ill-looking, nutritionally depleted with a serum albumin level of 17 g/l, and weighed 40 kg. Following the correction of fluid and electrolyte imbalances and appropriate blood transfusions, the patient was commenced on central total parenteral nutrition (TPN) and octreotide and kept nil per mouth. However, the fistula output still remained high (>1 500 ml/day); by day 15, the albumin level was 18 g/l and her weight 41 kg. Particularly challenging at this stage was a secondary thrombophilic state that was diagnosed. Despite anticoagulant therapy, the patient continued to develop thrombi in major veins that made venous access for TPN difficult.

On day 25 of TPN, the patient developed severe thrombo-phlebitis of her left subclavian vein following catheter-related sepsis; this was the last unoccluded major vein in the neck. Attempts to effect sustainable peripheral nutrition were

unsuccessful on account of the thrombophilic state. This dilemma prompted consideration of fistuloclysis (feeding via the distal limb of the intestinal fistula). At this stage, the patient was noted to have a granulating laparostomy wound with the fistula demonstrating mucocutaneous continuity. A fistulogram confirmed the distance of the proximal limb from the duodeno-jejunal junction to be 200 cm, and the distance of small bowel beyond the distal limb of the fistula to be 300 cm. Distal obstruction was also excluded. The distal limb was cannulated with a 22 Fr feeding catheter and, once its position was confirmed, semi-elemental feeds were commenced at 30 ml/h, and increased by 20 ml/h each day until the rate was kept consistent at 100 ml/h.

Over a 3-week period, the fistuloclysis was well tolerated by the patient, and very few specialised nursing staff were required to maintain daily administration. The patient responded very well, and her albumin level increased to 25 g/l within 1 week of commencement. At the end of the third week, her albumin level improved to 38 g/l. She had become more independent, and required less nursing intervention with time. Once she was able to ambulate, she was able to administer her enteric feeds without any assistance and allowed to make home visits.

At 4 weeks following commencement of fistuloclysis, although the fistula output remained high (>1 000 ml daily), the serum albumin level had improved to 40 g/l. The patient was prepared and taken for surgical reconstruction.

Discussion

All patients affected by enteric fistulas face a prolonged and often debilitating hospital stay and require specific nursing care, among other multidisciplinary demands. These challenges to cost and labour intensity are met in specialised intestinal units in developed countries – a facility not readily available in developing countries. In the latter environment, simple, effective and cost-effective alternatives are always desirable.

Fistuloclysis, in certain prescribed scenarios, may be valuable as an alternative to the traditional route of expensive TPN for the management of HOECF. We suggest that patients with enterocutaneous fistulas with mucocutaneous continuity be considered for fistuloclysis. Since such fistulas do not, as a rule, close spontaneously,^{7,8} intubation to effect fistuloclysis is therefore not considered likely to compromise the possibility of spontaneous closure. Before fistuloclysis, a

fistulogram is crucial in order to establish the length of bowel distal to the fistula and the exclusion of distal bowel obstruction. A length of small bowel up to 100 cm, regardless of the presence of the colon, is considered adequate for effective nutritional support.⁶

Semi-elemental and elemental feeds with high-content medium-chain triglycerides (the absorption of which is independent of biliary and pancreatic secretions) are recommended.^{9,10}

Fistuloclysis can provide a simpler, more effective and much less costly alternative to TPN. It provides the patient with the necessary nutritional support without the drawbacks of TPN (expense, highly demanding on nursing care, and sepsis). Furthermore, the ease and safety of delivery of fistuloclysis affords early mobility to allow transfer to the base hospital, where fistuloclysis may continue to optimise the nutritional state until such time as the patient is considered fit for surgical reconstruction. Migration of the catheter may follow rigorous peristalsis in the distal bowel segment, and has been reported as a rare complication. Sound, double fixation of the catheter and its regular review are important considerations.¹¹

Improvement in intestinal barrier function with the reduction of bacterial translocation, maintenance of immune function and reduction of infectious complications are benefits that follow the use of enteral nutrition in general, compared with the use of TPN.^{12,13} Furthermore, long-term TPN is associated with atrophy of the small-bowel wall, making surgery on the small bowel demanding because of the difficulty in suturing atrophic bowel and the luminal disparity between proximal and distal segment. The infusion of nutrition in the distal limb may negate these technical difficulties.^{12,13}

In patients with mucocutaneous enterocutaneous fistulas who require protracted nutritional support before reconstruc-

tive surgery, fistuloclysis is an effective method for providing nutritional support in a safe, cost-effective manner. While TPN will continue to hold an eminent status in the delivery of nutritional support to patients with a HOECF, fistuloclysis may be considered to be an important ancillary, if not alternative, therapy to TPN in appropriate patients.

REFERENCES

1. Dudrick SJ, Maharaj AR, McKelvey AA. Artificial nutritional support in patients with gastrointestinal fistulas. *World J Surg* 1999; 23: 570-576.
2. Lloyd DAJ, Gabe SM, Windsor ACJ. Nutrition and management of enterocutaneous fistula. *Br J Surg* 2006; 93: 1045-1055.
3. Sitges-Serra A, Jaurrieta E, Sitges-Creus A. Management of postoperative enterocutaneous fistulas: the roles of parenteral nutrition and surgery. *Br J Surg* 1982; 69: 147-150.
4. Deitel M. Elemental diet and enterocutaneous fistula. *World J Surg* 1983; 7: 451-454.
5. Haffejee AA. Surgical management of high output enterocutaneous fistulae: a 24yr experience. *Curr Opin Clin Nutr Metab Care* 2004; 7: 309-316.
6. Teubner A, Morrison K, Ravishankar HR, Anderson ID, Scott NA, Carlson GL. Fistuloclysis can successfully replace parenteral feeding in the nutritional support of patients with enterocutaneous fistula. *Br J Surg* 2004; 91: 625-631.
7. Bosscha K, Hulstaert PF, Visser MR, van Vroonhoven TJ, van der Werken C. Open management of the abdomen and planned reoperations in severe bacterial peritonitis. *Eur J Surg* 2000; 166: 44-49.
8. Scott NA, Leinhardt DJ, O'Hanrahan T, Finnegan S, Shaffer JL, Irving MH. Spectrum of intestinal failure in a specialized unit. *Lancet* 1991; 337: 471-473.
9. Vu MK, Verkijk M, Muller ES, Biemond I, Lamers CB, Masclee AA. Medium chain triglycerides activate distal but not proximal gut hormones. *Clin Nutr* 1999; 18: 359-363.
10. Jeppesen PB, Mortensen PB. The influence of a preserved colon on the absorption of medium chain fat in patients with small bowel resection. *Gut* 1998; 43: 478-483.
11. Mettu SR. Fistuloclysis can successfully replace parenteral feeding in the nutritional support of patients with enterocutaneous fistula. *Br J Surg* 2004; 91: 625-631.
12. Kudsk KA. Current aspects of mucosal immunology and its influence by nutrition. *Ann J Surg* 2002; 183: 390-398.
13. Kudsk KA, Croce MA, Fabian TC, et al. Enteral versus parenteral feeding. Effects on septic morbidity after blunt and penetrating abdominal trauma. *Ann Surg* 1992; 215: 503-511.