

Innovations in the management of complex enterocutaneous fistula: can a small rural hospital deliver the care needed to manage abdominal fistula?

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Introduction

An enterocutaneous fistula (ECF) is an abnormal tract between the bowel (enteral) and the skin (cutaneous). An enteroatmospheric fistula (EAF) is a small catastrophic subset of ECF, where the bowel migrates to the skin surface and is visible to the atmosphere. Due to the high flow of chyme passing through, in most cases, duodenal, jejunal and proximal ileal bowel are generally the locations of this catastrophic event.

The distance into the gut of the anatomical point of exit from the gastrointestinal tract will determine the volume of output. This is imperative information needed to plan goals of care for a successful outcome.

One of the most challenging and resource demanding aspects of fistula management is local control of the effluent output! The consequences of an inability to contain fistula output have a significant morbidity for patients. This includes moisture associated skin damage (MASD), unpredictable leaks which are detrimental to quality of life, pain, and prolonged hospital admissions. The aim of fistula management is to devise and implement a plan of care, in partnership with the patient and their family that achieves the following goals:

- Prevents skin breakdown
- Contains the chyme output
- Is comfortable for the patient
- Optimises both physical and psychological condition before definitive surgery or leads to spontaneous closure

This case study will follow the care pathway of Ray and his wife Pat through their journey with a fistula. With the ever-changing challenges that fistula care can present it is unlikely that one strategy will be successful for the duration of care delivery. This paper will detail an innovative containment strategy and the benefits of a revolutionary re-feeding device in fistula care.

Conflict of Interest: nil

Disclaimer: the opinions and practices in this paper represent our personal practice reality only.

Confidentiality: the clients whose care is detailed in this paper have consented to the sharing of their personal information and pseudonyms have been used.

Gastrointestinal Fistula

Factors which can contribute to gastro-intestinal fistula occurrence include:

- Malignance
- Inflammatory bowel disease particularly Crohn's disease
- Mesh placement
- Radiation enteritis
- Diverticulitis particularly with abscess formation and perforation
- Iatrogenic injury during surgery
- Anastomotic breakdown

Who are Ray and Pat?

Aged 73 years Ray is a retired dairy farmer from the West Coast. He worked on and owned farms for most of his working life. Ray has 4 children and gained 2 stepchildren when he married Pat in 1992. Ray and Pat now live a short distance from the small rural hospital which is undertaking his care.

Surgical History

Ray presented with a change in his bowel habit. A colonoscopy confirmed a rectal cancer. He was also found to have multiple polyps however, biopsies confirmed that none of these were cancerous.

Following long course chemo-radio therapy the associated risks and complications of low anterior resection verses an abdominal perineal resection (APR) were discussed with Ray and Pat. Ray and Pat believed that he would have a better quality of life with an AP resection and permanent end colostomy.

Surgery

- Elective AP resection
- Post-operative ileus

- Total parenteral nutrition
- Wound dehiscence of both the abdominal and the perineal wounds.
- Small bowel fistula

By day 12 post operatively Ray's abdomen laparotomy and perineal wounds had dehisced, his colostomy was dusky. Two enterocutaneous fistulae were sited at the top of the wound and were discharging bowel effluent. See Fig 1&2. Containment was achieved with the use of an eakin® Wound Pouch™.

Products used and rationale for selection

EAKIN COHESIVE® SEALS AND SKIN BARRIERS (FIG 1)

One of the fundamentals of fistula care is skin protection. With Ray the wound was framed with eakin® Cohesive® seals and eakin® Cohesive® seals skin barriers. In the highly wet environment of a fistula, we needed the most absorbent seal available, at 4 grams of absorption per gram of seal this was the eakin® Cohesive® range. By absorbing any free contaminant into the eakin® seal enzyme irritants are removed from contact with the skin. This mode of action helps return the skin pH to its normal slightly acidic range. The eakin® seals are highly mouldable adapting to fill any creases in the abdominal surface.

EAKIN WOUND POUCHES™

The eakin® pouch range offered us all the features of eakin® Cohesive® as well as 15 different pouch sizes to select the most suitable one for Ray's needs. Different pouches were needed as healing occurred.

The ability to add a window to the eakin® Wound Pouch™ became essential at a later date.



Figure 1:
Day 12
Wound
dehiscence



Figure 2:
Day 23
Further
dehiscence

By day 46 post operation Ray was on parenteral nutrition when his wound dehisced further to be the entire length of his laparotomy wound. The lower wound was covered in biofilm with areas of hypergranulation, wound healing appeared to be stalled. The new area of dehiscence was approximately 2 cm in depth with an enterocutaneous fistula visible. The distal side of the fistula was not visible at this stage. Ray was experiencing distressing periods of confusion and containment was becoming more problematic.

Negative Pressure Wound Device and Segregation of Fistula

With the aim of kick starting wound healing again we began to consider the use of a negative pressure wound therapy with segregation of the fistula through the sponge. As negative pressure wound devices (NPWD's) have become common place in managing chronic or acute wounds, it is not surprising that they are also becoming an option for the management of fistula!

The goals of using NPWD were:

- To provide a closed moist wound healing environment with protection from secondary infection
- To reduce wound oedema
- Remove exudate while removing the biofilm and suppressing the hypergranulation
- Increase cell replication and granulation
- To approximate the wounds edges so the wound could heal by secondary intention
- Effectively protect the surrounding skin edges
- Provide security with predictable dressing wear times while reducing frequency of dressing changes



One of the characteristics which define expert practice is the ability to acknowledge your own practice limitations. Never having used a NPWD on a fistula wound or segregated a fistula we reached out to the Omnigon Territory Manager for assistance.

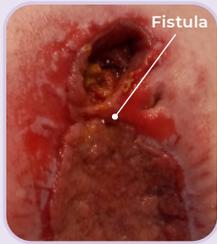


Figure 3A



Figure 3B



Figure 3C

Figure 3A, 3B, 3C: Segregation of Fistula with baby teat & NPWD



Figure 4:
NWPT
in place



Figure 5:
one week
after NPWT
reduced
in size

Evidence of improvement was obvious after one week of NWP therapy. The wound has reduced in length, width and depth. The fistula has now bubbled above skin level and the distal loop is now visible. Access to the distal loop opened the option of re-feeding.

The Insides System: a chyme refeeding medical device

Two of the most important elements in preparing for definitive surgery to close a fistula are nutritional support and management of fluid and electrolyte balance. While enteral feeding has significantly less risks than parenteral feeding use of enteral feeding is limited by the following:

- Obstruction
- Radiation damage
- Inflammation
- Strictures
- Short bowel
- High fistula⁴

Parenteral nutrition tends to be the mainstay of nutritional support for those with an ECT. This can lead to long enforced hospital admissions. There are also recognised detrimental psychological effects from long term, enforced periods of nil per mouth.

The goals of re-feeding chyme were:

- Earlier return to oral feeding
- Improved nutritional outcomes.
- Improved wound healing
- Restoring the gut function and preventing dehydration.
- Reduced risk of renal and liver dysfunction
- Possibly facilitate periods of leave from hospital or even discharge

With the distal limb of his fistula now visible Ray was assessed as a candidate for re-feeding with the Insides™ Re-feeding device. A CT scan determined that Ray had no distal obstructions or enterotomies and there was sufficient length of bowel for re-feeding to be successful. Once again, acknowledging that we have never undertaken this procedure before we reached out to the Insides™ Company Nursing team who reviewed Ray and initiated re-feeding.

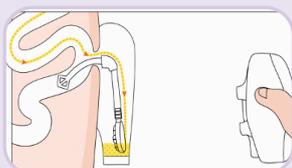


Figure 6: Insides™ re-feeding device showing tube diver and chyme in pouch



Figure 7: Showing pump attached to outside of pouch & re-feeding down distal limb of fistula

Key Features of the Insides™ Re-feeding Device

- It has three components, a driver, a tube and a pump. The Insides System performs bolus chyme refeeding.
- It is a closed system with no need to remove a stoma pouch to re-feed. The pump attaches to the outside of the pouch. The tube is inserted by a health care professional into the distal outlet of the fistula. The little pump is attached to the end of the tube and sits immersed in the chyme. The driver magnetically couples with the pump, through the bag to 'drive' the chyme up the tube and into the distal intestine intermittently.
- The driver has multiple speed settings that can deal with a range of viscosities of chyme to refeed. The driver has a 2-week battery life.
- The Insides™ System is approved for use in NZ, UK, EU and has break through clearance with the American FDA.



Figure 8:
The Insides™ re-feeding tube in situ surrounded by eakin Cohesive skin barriers



Figure 9:
eakin Wound Pouch™ with window

eakin dot® colostomy pouch in use. Re-feeding with the Inside™ Pump has revolutionised and simplified Ray's care. He is now on a full diet with his colostomy fully functional. Parenteral nutrition has been stopped and his albumin is within normal range. He has started short periods of hospital leave.

The Small Things that Make a Huge Difference

The rapport that can develop between the patient with an ECF, their family and the nursing team who share their experience can be a deciding factor in the patient's psychological resilience to endure to recovery⁵.

For Ray some of the small things we did made a huge difference. Ensuring that both he and Pat were engaged as partners in his care was imperative. With a bed in his room Pat was free to stay as she wished without becoming exhausted herself. Having his small dog in to the ward on visits was one way of keeping Ray aware that he had a life to return to.

Ray has an engaging, cheeky sense of humour, with his banter and jokes we had many a laugh over his memories of his life as a young man. With Ray's old-time music on his radio, we had an opportunity to incorporate a few dance moves into a dressing change.

Conclusion

It is often assumed that a wound will not heal if bathed in faecal effluent. Our experience in this case study has shown us that the opposite is true. Wounds do heal in the presents of faecal effluent.

Caring for Ray has been a huge and at times frustrating learning curve for our whole team. At times we wondered if our small rural hospital had the resources to manage his care. In spite of these doubts, we have been inspired and in awe of the way our small nursing team embraced and delivered the complex care that Ray needed.

Ray and Pat's journey continues however we take forward from this experience new learning regarding containment with fistula segregation, new skills in pouching using eakin Wound Pouches™ and a new appreciation of the difference and hope that re-feeding with the Inside™ Pump brings to fistula care.

Acknowledgement

We would like to acknowledge, that Ray's care has only been achieved with input from our entire multidisciplinary team. In particular, we wish to acknowledge the nursing team on the surgical ward at Wairau hospital who have been outstanding in raising to the challenges of Ray's complex care.

We also wish to acknowledge Emma Ludlow, from the Insides™ Company for her assistance in teaching us about re-feeding and Lorraine Andrews from Omnigon for her assistance with pouching and segregation of fistulas.

Last but not least in this journey many thanks to those known here as Ray and Pat. Thank you for allowing us to learn and to share your story so others can also learn from your experience.

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