CASE REPORT

Contemporary non-surgical approach for faecal diversion in a case of Fournier's gangrene

Harsh Sheth, Shilpa Ashutosh Rao, Karthik Venkataramani

Department of General Surgery,
Seth GS Medical College and
KEM Hospital, Mumbai, India

Correspondence to
Dr Harsh Sheth,
harsh86sheth@gmail.com

Accepted 5 December 2017

SUMMARY

Fournier's gangrene is a fatal necrotising fasciitis of the perineum, genitals and lower abdomen. Patients often need an aggressive surgical debridement, and in few cases, a diverting colostomy. We report the case of a 70-year-old man with multiple comorbidities diagnosed with Fournier's gangrene, who underwent debridement and had a wound complication due to faecal contamination. A novel, self-retaining rectal device was used to perform faecal diversion, which subsequently showed wound healing within a week, hence avoiding the need of a colostomy.

BACKGROUND

Stool management in bedridden patients remains a challenge despite the recent advancements in technology aimed at helping patients with faecal incontinence. In this patient scenario, the patient and caregivers were experiencing the same challenge. Fournier's gangrene, a rare disease, is associated with acute fulminant infection of the genital, perineal and abdominal region. Early diagnosis and aggressive surgical debridement is the cornerstone of management. Contamination by faecal micro-organisms can complicate these wounds, especially in elderly patients who present with anal sphincter dysfunction and faecal incontinence.^{1–3} Faecal diversion by creation of a temporary surgical stoma is usually mandated in such cases to expedite wound healing. However, it is an invasive procedure and requires a repeat surgery to reverse the stoma.⁴

Figure 1 Faecal contamination in the perianal region of patient with Fournier's gangrene after 72 hours of admission in the facility, prior to placement of the SMK. The Bates-Jensen Wound Assessment Tool was 40 (scale 1–60). SMK, Stool Management Kit.

Hence, solutions that can help alleviate these challenges and expedite the healing process, are of crucial importance. Non-surgical catheter-based faecal diversions have been previously reported using a balloon-based silicone rectal tube, but there are chances of injury with its usage (see the Discussion section). In this report, we describe the successful use of a novel, self-expanding, non-balloon-based indwelling intra-rectal catheter for stool diversion, in a case of Fournier's gangrene, with faecal contamination of the wound.⁵

CASE PRESENTATION

A 70-year-old man with non insulin dependent diabetes mellitus and alcoholic liver disease presented to the emergency department with a 5-day prior incident of painful swelling and discoloration of scrotum and perianal region. Examination revealed blackish discoloration of the skin over the scrotum, perineum and perianal regions with localised areas of induration and crepitus. The patient also reported abdominal distension. A clinical diagnosis of Fournier's gangrene was made based on clinical signs and symptoms. Based on this, the patient was listed for an emergency debridement of the wound, with a plan to have a relook at 48 hours to re-assess the wound and plan for faecal diversion.

INVESTIGATIONS

Ultrasound of the abdomen revealed moderate ascites, evidence of cirrhosis of liver and portal hypertension. Laboratory investigations revealed elevated transaminases and a deranged prothrombin time. The patient's Child-Turcotte-Pugh (CTP) score was 8, class B, for the extent of liver cirrhosis.⁶

Microbial examination from wound swabs showed polymicrobial growth of *Escherichia coli*, *Klebsiella* spp and Enterococci bacteria.

DIFFERENTIAL DIAGNOSIS

A clinical diagnosis of Fournier's gangrene was made with a score of 10 on Fournier's Gangrene Severity Index.⁷

TREATMENT

Aggressive surgical debridement of the wound was performed under general anaesthesia. Wound was packed with roller gauze soaked in chlorinated lime. Parenteral broad-spectrum antibiotics were started and modified as per sensitivity report of the wound swab. Repeat examination of the wound

CrossMark

To cite: Sheth H, Rao SA, Venkataramani K. *BMJ Case Rep* Published Online First: [please include Day Month Year]. doi:10.1136/bcr-2017-222282

Figure 2 Faecal contamination in the scrotum and perineum region of patient with Fournier's gangrene after 72 hours of admission in the facility, prior to placement of the SMK. The Bates-Jensen Wound Assessment Tool was 40 (scale 1–60).

at 48 hours revealed foul odour of the wound with significant faecal contamination of the wound. The patient also had a weakened anal sphincter tone as detected by finger examination. The stool was of mushy consistency with ragged edges and scored Bristol type 6 (scale range 1–7).⁸ Based on these clinical symptoms, a decision for faecal diversion was made to promote wound healing.

However, the patient was at high-risk for a surgical stoma creation in view of the CTP class B. Hence, we used a novel, self-retaining, low-profile catheter-based Stool Management Kit (SMK), Qora Aeon (Consure Medical Private Limited, India). A written informed consent was obtained for the same from the patient and his relatives. The patient was started on a stool softener to prevent formation of impacted faeces.

OUTCOME AND FOLLOW-UP

The Bates-Jensen Wound Assessment Tool at the time of device insertion was 40 (figures 1 and 2).⁹ On day 4 of the device insertion, the wound score decreased to 23, and further improved to

Figure 3 Minimal faecal contamination in the perianal region of patient with Fournier's gangrene after 7 days of SMK being in situ. The Bates-Jensen Wound Assessment Tool improved to 20 (scale 1–60).

Figure 4 Minimal faecal contamination in the scrotum and perineum region of patient with Fournier's gangrene after 7 days of SMK being in situ. The Bates-Jensen Wound Assessment Tool improved to 20 (scale 1–60).

20 on day 7 (figures 3 and 4), thereby indicating wound healing (scale range 1–60). While the device was in situ, no faecal soiling of the wound was evident and the patient did not complain of any discomfort. In addition, there was a significant decrease in wound slough.

The SMK device was kept in situ for 7 days. The device was spontaneously expelled once the patient became ambulatory and could hold his faeces. A repeat per-rectal examination after device removal showed a stronger anal tone. A per-rectal examination and proctoscopy showed no abnormality. The wound under investigation was healing with healthy granulation tissue, minimal sloughing and no faecal soiling. The patient was discharged on oral antibiotics, and a wound score of 18 and returned 2 weeks later with a wound score of 11, which indicated wound regeneration. The patient reported a good anal tone, which was confirmed by per rectal.

DISCUSSION

In patients with perianal abscess and Fournier's gangrene, faecal diversion is indicated if there is anal sphincter damage, faecal incontinence and gross faecal contamination of the wound.¹⁰ Traditionally colostomy (stoma formation) has been used for faecal diversion as its believed to be of added benefit in management of Fournier's gangrene.^{2 3 10 11} However, the use of a stoma has also shown to increase overall morbidity, length of stay and healthcare costs.^{12–15} Stoma creation also leads to complications such as parastomal hernia, incisional

Figure 5 Qora SMK. Used with permission from Consure Medical Private Limited.

hernia, colostomy prolapse, necrosis and stenosis which may necessitate additional surgery.^{14–16} Additionally, there is a need to reverse the stoma once the wound heals, and incontinence resolves. This can lead to further complications such as anastomotic leakage and bowel injury. The cost to manage patients with complications is higher than the cost of managing the patient using intrarectal catheters. The average cost of faecal diversion with a colostomy is US\$9341, as compared with US\$6510 for an intrarectal balloon catheter. No similar study has been carried out comparing the cost differential for a non-balloon-based catheter, such as the one used in this study.^{15 17}

Non-surgical faecal diversion has been performed in cases with severe perianal sepsis using the ConvaTec Flexi-Seal Faecal Management System.^{5 14} However, it can lead to pressure necrosis due to inflation of the balloon and haemorrhage in the rectum following prolonged use of the device. Additionally, the large bore catheter can further aggravate sphincter dysfunction, cause anal erosion and significant foreign-body sensation.^{5 18}

To circumvent these associated problems, we used a new non-balloon-based self-retaining device that acts as a conduit for faeces passage from the rectum to an external stool collection bag (figure 5). The device is approved by the US Food and Drug Administration for faecal diversion usage for up to 29 days. The primary component of the device is a soft, self-expanding faecal diverter that gets deployed at the anorectal junction. This is connected to a thin skin friendly transit sheath, which traverses the anal canal and drains into a disposable collection bag. The faecal diverter and the transit sheath can be used for up to 29 days, whereas the collection bag needs to be changed once it is filled with faecal matter. The flexible self-expanding faecal diverter conforms to the wall of the rectum at rest, as well as during contraction while passing stool. The thin transit sheath reduces the risk of anal sphincter dysfunction, anal erosion and foreign body sensation. By diverting faeces into a stool collection bag, contamination of the perineal and scrotal wounds with faecal micro-organisms is prevented, resulting in quicker wound healing and better faecal management.

The chances of rectal irritation and spontaneous expulsion can be significantly lesser with this device as it is a non-balloon-based catheter. The soft, flexible, indwelling faecal diverter forms a good seal against the rectal wall. This reduces

the chances of leakage or seepage around the device. The transit sheath allows stool to move freely across it, but requires the attention of nursing staff to ensure it stays in position, without kinking or twisting. Even though this device is recommended for non-ambulatory patients, it has been used for a semimobile patient in this instance, to expand the usage indications. Once the patient regained mobility and faecal tone, the device was spontaneously expelled.

It is important to ensure that patients are compliant with stool softening regimes, to prevent stool impaction around the faecal diverter. We kept the patient on two teaspoons of lactulose syrup taken two times a day to keep the stools semisolid to liquid in consistency.

Proper device insertion by an experienced physician and training in device insertion can reduce the chances of improper deployment and complications.

Faecal management systems, such as the one used in this case report, can effectively divert stools in patients with Fournier's gangrene and allow for wound healing and regeneration. This not only prevents deterioration of the wound, but also avoids the morbidity associated with a colostomy and its complications.¹⁴

In view of these findings, we propose the use of this novel non-balloon-based, self-retaining device as a medically safe alternative to colostomy for faecal diversion in such cases.

Patient's perspective

After the surgery which created my perineal wound, I was unable to control the outflow of faeces and was wearing a diaper which needed to be changed 4–5 times a day. I rejected the doctor's suggestion of creating a stoma to divert the faeces, due to the high risk associated with the surgery. One of the doctors suggested we try out this device, which would collect faeces from the inside, into a bag outside. We immediately agreed and the device was inserted. I barely felt its presence inside and the wound improved markedly after its insertion. The doctor said this was owing to the faeces not spilling onto the wound. It stayed inside for 7 days, following which it came out by itself. By the time it was out, I could control the faeces. This device prevented me from being subjected to an additional surgery and the psychological trauma of faeces flowing out from an opening made in the abdominal wall.

Learning points

- ▶ Anal sphincter dysfunction is a common occurrence in extensive debridement for Fournier's gangrene, leading to faecal contamination and deterioration of the wound.
- ▶ Currently, most surgeons manage this complication by creating a colostomy for faecal diversion, which is riddled with additional costs and complications.
- ▶ Using a non-balloon based catheter with a soft, flexible, indwelling faecal diverter (instead of a balloon based system) avoids faecal contamination of the perineal wound, aiding in the healing process. This can effectively circumvent the creation of colostomy for faecal diversion in cases of perineal sepsis.

Twitter @slitnstitch

Acknowledgements The authors acknowledge the Dean, Seth G S Medical College and King Edward Memorial Hospital, Parel, Mumbai.

Contributors HS: involved with planning the study, patient care, taking a written informed consent, device insertion, gathering data, analysing the data and writing the case study. SAR: involved with planning of the case study, overseeing patient care, written informed consent, gathering data, analysing the data and writing the case study. KV: involved with patient care, patient follow-up, gathering data, data analysis and writing the case study.

Competing interests None declared.

Patient consent Obtained.

Provenance and peer review Not commissioned; externally peer reviewed.

© BMJ Publishing Group Ltd (unless otherwise stated in the text of the article) 2017. All rights reserved. No commercial use is permitted unless otherwise expressly granted.

REFERENCES

- Huang CS. Fournier's gangrene. *N Engl J Med* 2017;376:1158.
- Eke N. Fournier's gangrene: a review of 1726 cases. *Br J Surg* 2000;87:718–28.
- Oguz A, Gümüş M, Türkoglu A, et al. Fournier's gangrene: a summary of 10 years of clinical experience. *Int Surg* 2015;100:934–41.
- Akcan A, Sözüer E, Akyildiz H, et al. Necessity of preventive colostomy for Fournier's gangrene of the anorectal region. *Ulus Travma Acil Cerrahi Derg* 2009;15:342–6.
- Goh M, Chew MH, Au-Yong PS, et al. Nonsurgical faecal diversion in the management of severe perianal sepsis: a retrospective evaluation of the flexible faecal management system. *Singapore Med J* 2014;55:635–9.
- Farnsworth N, Fagan SP, Berger DH, et al. Child-Turcotte-Pugh versus MELD score as a predictor of outcome after elective and emergent surgery in cirrhotic patients. *Am J Surg* 2004;188:580–3.
- Corcoran A, Smaldone M, Gibbons E, et al. Validation of the Fournier's gangrene severity index in a large contemporary series. *J* 2008 <http://www.sciencedirect.com/science/article/pii/S002253470801241X> (accessed 27 Jun 2017).
- Lewis SJ, Heaton KW. Stool form scale as a useful guide to intestinal transit time. *Scand J Gastroenterol* 1997;32:920–4.
- Harris C, Bates-Jensen B, Parslow N. Bates-jensen wound assessment tool: pictorial guide validation project. *J Wound* 2010 http://journals.lww.com/jwoconline/Abstract/2010/05000/Bates_Jensen_Wound_Assessment_Tool_Pictorial.5.aspx (accessed 20 Jun 2017).
- Brondor CS, Cowey A, Hill J. Delayed stoma formation in Fournier's gangrene. *Colorectal Dis* 2004;6:518–20.
- Moorthy K, Rao PP, Supe AN. Necrotising perineal infection: a fatal outcome of ischioanal fossa abscesses. *J R Coll Surg Edinb* 2000;45:281–4.
- Ozturk E, Sonmez Y, Yilmazlar T. What are the indications for a stoma in Fournier's gangrene? *Colorectal Dis* 2011;13:1044–7.
- Korkut M, Içöz G, Dayanç M, et al. Outcome analysis in patients with Fournier's gangrene: report of 45 cases. *Dis Colon Rectum* 2003;46:649–52.
- Ozkan OF, Koksall N, Altinli E, et al. Fournier's gangrene current approaches. *Int Wound J* 2016;13:713–6.
- Eray IC, Alabaz O, Akcam AT, et al. Comparison of diverting colostomy and bowel management catheter applications in Fournier gangrene cases requiring fecal diversion. *Indian J Surg* 2015;77:438–41.
- Park J, Del PA, Orsay C, et al. Stoma complications. of the colon & rectum, 1999. <http://link.springer.com/article/> (accessed 20 Jun 2017).
- Pokorny H, Herkner H, Jakesz R, et al. Mortality and complications after stoma closure. *Arch Surg* 2005;140:956.
- Estrada O, Martinez I, Del Bas M, et al. Rectal diversion without colostomy in Fournier's gangrene. *Tech Coloproctol* 2009;13:157–9.

Copyright 2017 BMJ Publishing Group. All rights reserved. For permission to reuse any of this content visit <http://group.bmj.com/group/rights-licensing/permissions>.
BMJ Case Report Fellows may re-use this article for personal use and teaching without any further permission.

Become a Fellow of BMJ Case Reports today and you can:

- Submit as many cases as you like
- Enjoy fast sympathetic peer review and rapid publication of accepted articles
- Access all the published articles
- Re-use any of the published material for personal use and teaching without further permission

For information on Institutional Fellowships contact consortiasales@bmjgroup.com

Visit casereports.bmj.com for more articles like this and to become a Fellow