

Case study: Fournier's gangrene: management of an extensive wound

Gibbins S

This case study was a winning entry in the inaugural Paul Hartmann /AWMA Advanced Wound Care Course Scholarships in 2006. Winners were chosen following a rigorous assessment process by the AWMA Executive Committee members and AWMA Education and Professional Development Subcommittee members.

Abstract

Mr L, a 43 year old male with Type 2 diabetes, developed an infection in the right groin after a fall. He was diagnosed with Fournier's gangrene and underwent surgery four times for debridement of infected, necrotic tissue. An extensive wound extending from the right groin around to the right buttock with a 2cm margin from the anus was created. After 10 days of normal saline gauze packs, use of a topical negative pressure dressing was suggested. Problems with the irregularity of the wound margins, the location of the wound in the groin, and its proximity to the anus were overcome by an innovative approach to wound management.

Gibbins S. Case study: Fournier's gangrene: management of an extensive wound. Primary Intention 2006;14(3):112-115.

Presentation

Mr L, aged 43 years, was referred to the hospital by his GP with an infection in the groin, provisionally diagnosed as cellulitis. John was pale, 185cm tall, and weighed 145kg. John had presented to his GP complaining of a swelling in his right groin after a fall 5 days before. He also complained of headaches, a cough, rib pain, and he had a fever. Augmentin forte was prescribed for a possible chest infection.

Five days later he was sent to the emergency department with a firm, erythematous swelling of the right groin just below the scrotum, extending towards the buttocks, with an area of skin which was broken and oozing pus. He was febrile at 38.5° and suffering significant groin pain and dysuria. He was taken to theatre that evening for debridement of the wound; two deep communicating abscesses in the right groin were drained of foul smelling pus.

Sharon Gibbins RN, STN, BHSc

CDN Gastrointestinal Unit
The Canberra Hospital, ACT
Tel: (02) 6244 2561
E-mail: Sharon.gibbins@telstra.com

The next day the infectious disease team reviewed John and suggested that the infection was Fournier's gangrene, a rare type of necrotising fasciitis, more common in males and occurring mainly after an injury to an area in individuals who are diabetics or who are immuno-compromised. Fournier's gangrene can lead to shock, ileus, delirium, multi-organ failure and death¹. Swabs of the groin on admission showed a moderate growth of strep agalactiae and heavy bacterioides. Analysis of the pus collected during surgery showed some enterococcus faecalis. From a social perspective, Mr L lived alone and was currently unemployed.

Medical history

Mr L had had Type 2 diabetes since 1999. He was poorly controlled on insulin QID. Mr L had a history of cellulitis, appendicectomy, glaucoma, orthopnoea and mild asthma. He wore glasses and became breathless on exertion and in certain positions. On admission, Mr L's medications were insulin QID and Augmentin Forte TDS. He had no known allergies.

Wound profile

Mr L's wound extended from his right groin at the top of the pubis to 2cm from the anal verge. The wound was deep, with

loss of subcutaneous tissue and cavity formation along the upper right groin. There was still a layer of sloughy tissue covering approximately half of the wound bed. The rest of the wound bed was mottled pink. A 1cm piece of necrotic tissue was left.

The wound was mildly malodorous. The exudate was haemoserous and there were problems with containment. The surrounding skin was erythematous with small areas of maceration. Eight days later, the buttock wound was 10cm long, 14cm across and up to 2cm deep. The groin wound was irregular and up to 4cms deep, with tracking up to 5cm along the groin (Figures 1 & 2). Debridement plus a course of IV antibiotics (clindamycin, ciprofloxacin and ticarcillin for 3 days followed by 6 days of penicillin and metronidazole) stopped the fasciitis.

Aim

The treatment aim was to enhance wound healing through critical analysis of the patient and his wound and to formulate evidence-based wound management solutions that encompassed a holistic approach.

Management

The initial management of the wound included four surgical debridements of the extending gangrene over a period of 7 days. Each debridement removed large amounts of pus and necrotic tissue. The wound was packed with povidone-iodine gauze intraoperatively. The author first viewed Mr L's wound when I assisted in changing the BD normal saline gauze packs, which were used to continue mechanical debridement of the wound bed.

At Day 10, the wound was assessed for a possible negative pressure dressing. Surgical and nursing staff thought the wound was too close to the anus to maintain a positive seal (Figure 2) for the following reasons:

- Excessive perspiration in the groin, which could lift the film dressing.
- Uneven wound margins with many skin folds, which could make dressing application difficult.
- Proximity to the anus, which could limit the area for adherence of the film dressing, and result in potential faecal contamination of the wound and lifting of the dressing.

- Stress on the dressing secondary to mobilisation and movement in the bed, which could lift the dressing.

The authors' previous experience with negative pressure dressings provided a possible solution.

Dressing technique

The dressing technique involved many steps to ensure adherence of the film dressing to the skin. The area was prepared by clipping the pubic hair. The skin was thoroughly cleaned and dried. A barrier wipe was used on the surrounding skin to help the film dressing stick, and protect the skin if the dressing leaked. Another nurse helped to hold the skin folds and legs apart, maintaining a smooth surface when applying the film dressing.

Figure 1.



Figure 2.



Initially the wound was debrided of a small amount of slough. The groin wound was dressed first with the foam and film dressing, and tubing attached. Then Mr L was rolled onto his left side so the buttock wound could be prepared. Attending to the buttock wound last meant that minimal time was spent on this area before negative pressure was applied, preventing lifting of the film through seepage of exudate from under the film. The film dressing was cut into smaller more manageable pieces for ease of application.

The film dressing was placed right over the anus, following the contours. A 2cm hole was then cut in the film dressing for passage of flatus. An absorbent pad was placed in the anal crease to absorb any moisture. The buttocks were taped together with flexible tape, preventing the dressing from lifting on movement. The negative pressure was set at 125mmHg continuous pressure as per product guidelines².

While obtaining a history, Mr L had informed the author that he only had a bowel action every 2-3 days. This was fortunate as the dressing could be left intact until he was due to have a bowel action. The outer tape could be removed, and the film dressing cut back to allow the bowel action to occur. Mr L was advised to shower after the bowel actions only, as showering added to problems with the dressing lifting. When necessary, a small enema was given so that the dressing could be attended at a reasonable time.

A wound management plan identified the dressing technique and materials used. Photos were included to assist in visualising the status of the wound, which provided surgeons and other staff with visual descriptions of the wound's progress without having to remove the dressing.

A number of positive benefits arose out of the use of the negative pressure dressing. It was found to be more comfortable for Mr L than the twice-daily saline packs, mobilisation was much easier, and clothing and linen changes were minimised as exudate was contained. In addition, dressing changes were reduced to three times a week, odour was decreased by using a closed dressing system, and wound healing accelerated due to the topical negative pressure, reducing fluid levels at the wound bed and stimulating angiogenesis and the production of granulation tissue³.

Wound healing in this instance could have been delayed by Mr L's uncontrolled diabetes and decreased nutrition due to his poor appetite during the initial admission period^{3,4}. Wound

healing was probably aided by the dietitian supplying high protein drinks containing arginine, an amino acid that has been demonstrated to promote collagen deposition³.

In addition, the endocrinologist regulated John's blood sugar levels through continuous monitoring and adjustment of insulin where necessary. A diabetic educator helped improve John's knowledge of diabetes, which fostered improved compliance with changes to Mr L's management of his diabetes. Despite a wound swab revealing a growth of MRSA and pseudomonas, the wound continued to progress. Plastic surgeons were not prepared to close or graft the wound due to its position and the level of bacterial colonisation.

Progress/follow-up

Twenty four days after commencing the topical negative pressure dressing, Mr L was discharged with a portable topical negative pressure device, under care of the community nurses. A week before discharge, the author arranged for two community nurses to watch a dressing change, during which time all issues surrounding the management of the wound were discussed. They were also supplied with a copy of the wound management plan and photos for reference. The buttock wound had decreased in size to 10cm in length, 6cm wide and up to 1 cm in depth (Figure 3). The groin cavity was 2cm deep (Figure 4).

The day before discharge, Mr L had gone home with the occupational therapist. The day was hot. He wore tracksuit pants and his home did not have air conditioning. This caused extra sweating in the groin and the dressing was lifting when he returned, despite continuous topical negative pressure therapy. Mr L thought he could overcome these problems by wearing a light gown around the house. The community nurses also thought his bed would be too low for a lengthy dressing and his leg needed to rest on something high such as the bedrail, so we arranged for the hire of a hospital bed.

Discussion

The management of Mr L's wound was enhanced by the process of history taking, the speed of treatment, a multidisciplinary approach to patient care, and by the expertise of an experienced wound management nurse in customising and applying topical negative pressure dressings³. Prompt surgical intervention in the first instance

prevented life threatening consequences from the Fournier's gangrene. Repeated debridement of all visible necrotic and infected tissue was necessary because the extent of the infection cannot be determined by the edge of the necrosis. Reassessment of the wound for further debridement needed to be done every 24-48 hours¹.

Broad spectrum antibiotic coverage was used to treat the multiple micro-organisms, in particular the anaerobic bacteria. Innovative use of the topical negative pressure dressing, and improvements in Mr L's diabetic and nutritional status,

Figure 3.



Figure 4.



most likely enabled healing processes³. The topical negative pressure dressing assists in the healing process by stimulating blood flow to the wound bed, removing excess exudate and decreasing bacterial burden while maintaining the moist wound environment. These mechanisms stimulate granulation tissue production^{1,3,5}. These management strategies facilitated an earlier discharge from hospital, the transition of which was made smoother by prior consultation with, and education of, community nurses to ensure continuity of care.

Summary

The management of acute on chronic wounds arising from Fournier's gangrene are difficult due to the extent of necrotic tissue debrided and, in this instance, the location of the wound, which extended from the right groin to the anus. A comprehensive management plan was initiated that involved continuous surgical review, advice of a dietitian, endocrinologist and diabetes educator, and innovative use of topical negative pressure dressings to manage the wound.

Recommendation

Multi-disciplinary approaches aided by consultation with experienced wound management nurses can lead to more effective wound management regimes which have the potential to shorten length of stay, decrease nursing time spent on dressings, improve healing time and improve patient comfort³.

Declaration

The author declares that none of the products used to treat this patient were supplied directly by a manufacturer.

References

1. Yalamarathi S & Dayal S. Fourniers gangrene (evidence based review). The Royal College of Surgeons Surgical Knowledge and Skills. <http://www.edu.rcsed.ac.uk/lectures/l333.htm> Nov 2005
2. VAC Therapy Clinical Guidelines. KCI, 2005.
3. Carville K. Wound Care Manual. Osborne Park: Silver Chain Nursing Association, 2005.
4. Diabetes Mellitus and Wound Healing. http://www.diabetesforum.net/eng_treat_DM_wound_healing.htm Nov 2005.
5. Thomas S. An introduction to the use of vacuum assisted closure. <http://www.worldwidewounds.com/2001/may/Thomas/Vacuum-Assisted-Closure.html>, 2001