

Background

- Fournier’s gangrene (FG), a form of necrotizing fasciitis, is a rapidly progressive polymicrobial infection of the deep and superficial planes of the perianal and/or genital regions, sometimes through to the abdominal wall, that may quickly progress into a gangrenous process.

- Subtle pain in these anatomic areas, without visible signs of concern to the skin, or without symptoms at all, was reported in 40% of cases^[1]. With delay in care, this infection can rapidly progress into multiple organ dysfunction, sepsis, and death^[1].

- Symptoms: scrotal swelling is the most common symptom in 79% of cases, then tachycardia at 61%, purulent ‘dishwater’ exudate at the perineum at close 60%, crepitus at 54%, and fever at 41%^[6].

- Predisposing Factors^[4] : Diabetes Mellitus (76.9% has DM^[5]), alcohol abuse, immune compromised states, trauma, chemotherapy, radiotherapy to the perineum. Use of sodium-glucose cotransporter-2 inhibitors (SGLT2i), an antidiabetic, may also increase risk.

- Its presentation is considered both a medical and surgical emergency that requires a multidisciplinary approach. FG is a feat of surgical skill and timeliness, meticulous wound bed preparation, and a safe patient handling and mobility (SPHM) conundrum.

Current Practice Evidence

- NPWT with Instillation and Dwell Time (NPWTi-d) is the addition of instillation of a chosen solution to the wound base for preset ‘dwell’ time to standard VAC. NPWTi-d uses a more hydrophilic polyurethane foam, Reticulated Open Cell Foam-Cleanse Choice by KCI/3M (ROCF-CC), which allows mechanical solubilization of exudate-particulate through holes.

- Standard NPWT vs NPWTi-d^[10] - NPWTi-d is better in reducing mean colony forming units per gram (CFU/g) for infected wounds in seven days of application.

- Conventional dressing vs NPWTi-d^[10] – decreases in mean treatment days, time to wound closure, length of hospital stay, rate of recurrence of osteomyelitis, number of dressing changes and surgical debridement for NPWTi-d cases.

- SPHM has been associated with the rehabilitation specialties by convenience. However, it is not just basic patient care, but a mandated law in many progressive states, including New York, to protect the health worker and the patient. Of note, 2030 estimates show that 50% of the population will be obese (Finkelstein et al., 2012).

Clinical Cases & Methods

- Three patients, respectively Patient A, Patient B and Patient C were admitted to LIJ Valley Stream Hospital between March to May 2022 for complaints of pain and discomfort to the perineum and surrounding areas.

- All patients required emergent surgical debridement. The patients had surgery for colostomies to assist with wound healing to the perineum. The surgical team consulted PT wound care specialists to assess for NPWT candidacy and functional rehabilitation assessments with OT following debridement.

- SPHM, Early Mobility in the Critical Care principles and equipment were incorporated around wound dressing changes. In our hospital, of note, physical therapists with advanced credentials for, and /or competencies on integumentary care evaluate, apply and recommend conventional and advanced wound care modalities in close collaboration with speciality teams such as Surgical, Vascular, Podiatry, Infectious Disease, Critical Care and Nursing.



Demographics and Wound Etiology	Past Medical History	New Medical Diagnoses
Patient A: 55 y/o male Swelling and pain to R buttock x1 week with (+) soft tissue gas with adjacent stranding in the bilateral scrotum, perineum with extension to B buttocks	DM II, HTN	None
Patient B: 46 y/o male Scrotal pain x2 days with extension to L buttock, (+) fluid collection in perineum with extensive subcutaneous emphysema	No PMH	DM II
Patient C: 56 y/o male Buttock and rectal pain x2 weeks, (+) perirectal abscess, necrotizing fasciitis of the perianal area	Asthma, DM II	None

Wound Bed Preparation

- Wound cleansed with normal saline

- No Sting Barrier Film Dressing (Cavilon, 3M) to periwound to protect intact or damaged skin.

- Non-adherent silicone dressing (Adaptic Touch, Acelity/Systgenix) was used as contact layer to protect exposed organs^[13].

- ROCF-CC wound contact layer with 1.0 cm diameter through holes was cut to size and placed in wound bed followed by either the 8mm or 16mm thicker contact layer to fill explored tunnels and wound depth.

- Foam dressings were secured with use of drape and hydrocolloid sheets to assist with achieving a collapsed seal.

- 1000 ml Sodium Chloride 0.9% IV injection bag (saline bag) was used as instillation solution, per recommendations^[13].

- Dressing changes took place every 2 to 3 days.

	NPWT with Instillation Parameters per guidelines ^[13]	Chosen Parameters for Patients A and B
NPWT i-d System		V.A.C. VeraFlo
Dwell time	1 to 20 minutes	5 minutes, 10 minutes
NPWT cycle duration	30 minutes to 3.5 hours	30 minutes
NPWT Settings	25 mmHg to 200 mmHg in increments of 25 mmHg, continuous negative pressure or dynamic pressure control	125 mmHg, low, continuous
Instillation Solution	Normal saline, hypochlorous acid solution, sodium hypochlorite solution	Normal saline
Instillation Volume (Fill Assist Calculation)	Length X Width x 0.20	42 ml for both patients A and B initially
Materials	ROCF-CC, Reticulated Open Cell (Veraflo) ROCF-V, Reticulated Open Cell Foam Dressing (Granufoam)	Reticulated Open Cell Foam Dressing (Cleanse Choice) ROCF-CC

Results

Patient A	3/17/22	3/23/22	3/29/22
Length	18 cm	18 cm	17 cm
Width	14 cm	14 cm	10 cm
Depth	1.75 cm	1.5 cm	0.5 cm
Surface Area	252 cm	252 cm	170 cm

Patient B	4/4/22	4/20/22	4/29/22	5/14/22	6/1/22
Length	43 cm	24 cm	19 cm	12 cm	8 cm
Width	17 cm	18 cm	12 cm	4 cm	3 cm
Depth	8 cm	4.5 cm	4 cm	3.5 cm	0.10 cm
Surface Area	731 cm	432 cm	228 cm	48 cm	24 cm

Patient C	2/9/22	2/16/22	5/30/22
Length	11.5 cm	14 cm	9 cm
Width	6 cm	7 cm	0.5 cm
Depth	4.5 cm	3 cm	0.2 cm
Surface Area	69 cm	98 cm	4.5 cm

Discussion

- Following debridement in all patients presented, non-viable tissue still were evident. By using advanced wound care dressings, the need to return to the operating room (OR) for further debridement was eliminated. Only Patient B returned to the OR for a partial closure of the perineal wound. The physiological micro and macroscopic benefits via negative pressure enabled the wounds to heal faster.

- This form of therapy is indicated for wounds where there is greater than 50% of the wound bed presented with non-viable tissue^[13].The reduction in both soak and VAC time was significantly reduced to maximize potential granulation formation and facilitate removal of the necrotic tissue. Collaboratively and intuitively, the wound PT team had demonstrated that use of and advocating for weaning out of IV analgesia and topical pain medications facilitated better patient experience in an otherwise painful procedure.

- The rehabilitation team’s proactive trialling and creative use of SPHM devices available allowed for a sustainable, safe, and ergonomically sound procedure for the care team. For the patients, they anticipated not only careful and methodical attention to their wounds, but also dignified positioning while they were dependent physically, and later empowering as they rehabilitated back to their mobility.

