The use of a Negatively Charged Fiber (NCF)* antimicrobial barrier dressing to manage slough and necrotic tissue in wounds in acute settings

Kara S. Couch, MS, CRNP, CWCN-AP, FAAWC; **Christine Pennington,** RN, BSN, TCRN, CCRN, CWCN;
Rosie Mallet, BSN, RN, CWOCN; **Sarah Kogod,** BSN, RN, CWCN

INTRODUCTION

The presence of slough in wounds is known to delay and complicate wound healing. In a hospital setting, where early discharge is the goal, the presence of slough that cannot be surgically debrided completely, or not at all, can delay discharge. Slough is also intimately associated with germs and associated matter. A non surgical method of slough removal that is easy to use, affordable, and effective has long eluded clinicians. We present here some cases where slough laden wounds were chosen in an inpatient setting and targeted for removal with a **Negatively Charged Fiber (NCF)** dressing that has a silver barrier agent, providing dual action, that has been used in globally for support of debridement of slough, and which is highly evidence based in terms of slough removal.

METHODS

We selected pressure injuries of the sacrum, thigh, calf and wounds with calciphylaxis and also wounds around tube entry/exit sites, in a total of 5 patients, some with a wound. Patient histories are provided in the figures, photographs were taken in each case to demonstrate the ability of the Negatively Charged Fiber (NCF) dressing to remove slough from the wound. Case histories of each wound is provided.

RESULTS

Images (Figures 1-5) show in each case, complete or high degree of slough removal from the initiation of the charged fiber dressing regime. Most wounds achieved complete slough removal in the short time frame the patients were in the inpatient setting.

Case 1 – Sacral Pressure Injury

- 54 yo M with PMHx of FAP with initial colon cancer diagnosis, s/p colectomy and ileostomy, duodenal polyposis s/p Whipple procedure, ventral hernia s/p mesh repair and h/o desmoid tumors s/p multiple resections with recurrent desmoid tumor small bowel resection complicated by short gut syndrome.
- Developed HAPU after decrease in function related to cancer and overall medical issues
- WOUND CARE TREATMENT GOALS: to gently debride slough from wound bed without the use of sharp debridement

Figure 1A – 12/14/23
Prior to use of Negatively Charged Fiber (NCF) Dressing application, treating with honey and cross hatching for 3 weeks

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Figure 1A – 12/22/23
Sharp debrided in the OR, # 2 NCF dressing applied post sharp debridement

Figure 1A – 12/27/23
After application of NCF Dressing #3

Figure 1A – 1/2/24
After application of NCF dressing #5

- Total of 6 NCF Dressing applications, discontinued after resolution of slough in wound bed, after 6 Applications:
  - Red Tissue Increased 36%
  - Green / Yellow Tissue Decreased 34%
  - Care is currently ongoing (not yet dc'd)

Case 2 – R lateral knee PI + L lateral calf PI

- 37M PMH paraplegia (2012, s/t GSW), prior IVC filter for DVT, sacral pressure wounds s/p multiple debridements, removal of femoral hardware, ex lap with TAC with end ileostomy
- Multiple pressure ulcers that were present on admission, were not the reason for admission (urosepsis)
- Did several wounds with NCF dressing for slough removal and several with other SOC products
- WOUND CARE TREATMENT GOALS: to gently support debridement of slough from wound bed with new NCF dressing without the use of sharp debridement, and to optimize wound bed for flap placement

Figure 2A – 12/15/23

Figure 2B – 12/19/23

Figure 2C – 12/27/23
After 4th application of NCF Dressing Patient discharged back to LTAC

- Total of 4 NCF Dressing applications, discontinued after resolution of slough in wound bed

After 4 Applications:
- Red Tissue Increased 47%
- Pink Tissue Increased 26%
- Black / Green / Yellow Tissue Decreased 72%

Figure 2E – 12/15/23

Figure 2F – 12/19/23
After one application of NCF dressing, patient wound grafted

- Total of 1 NCF dressing application, discontinued after resolution of slough in wound bed

After 1 Application:
- Pink Tissue Increased 11%
- Black / Green / Yellow Tissue Decreased 4%

Case 3 – Calciphylaxis v. purpura fulminans on both right and left thighs

- 45 yo AAF with multiple medical problems
- PMHx of atopic dermatitis, prurigo nodularis, hypertrophic lichen planus, HTN, lymphedema, Afib (on Eliquis), HTN, HLD, recurrent LE cellulitis, history of EtOH abuse and alcoholic liver disease (w/o fibrosis), morbid obesity s/p gastric bypass, MSSA bacteremia who presented for chest tightness x 1 day, admitted for necrotic inner thigh wounds and multi-pathogen bacteremia.
- Biopsy done by derm: calciphylaxis v. purpura fulminans
- WOUND CARE TREATMENT GOAL: to promote separation of sloughy debris from wound edges to assist in non-surgical sharp debridement, and to decrease pain during dressing changes

L medial thigh wound (calciphylaxis)

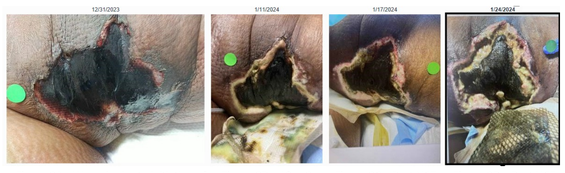


Figure 3A – Wound prior to initiation of NCF dressing application

Figure 3B – After 3 days of NCF (1st app)

Figure 3C – Post NCF application # 2

Figure 3D – Post NCF application # 3

R lateral thigh calciphylaxis wound

Figure 3E – Wound at initiation of NCF dressing application

Figure 3F – Post NCF application # I

Figure 3G – Post NCF application # 2

Figure 3H – Post NCF application # 3

- Total of 3 NCF dressing applications for each, discontinued after patient discharged to LTACH without followup

After 3 Applications:
- Black Tissue Decrease
- Increase in Yellow Tissue Separation from Wound Edges
- Able to remove eschar using scalpel debridement after NCF loosened it from all sides
- Discharged from hospital day 23

L medial calf calciphylaxis wound

Figure 3I – Wound at initiation of NCF dressing application

Figure 3J – Post NCF application # I

Figure 3K – Post NCF application # 2

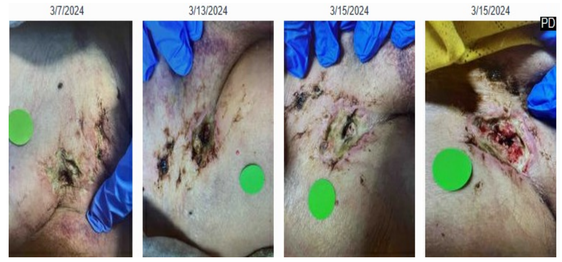
Figure 3L – Post NCF application # 3

- Total of 3 NCF dressing applications, discontinued after patient discharged to LTACH without followup

After 3 Applications:
- *Able to mechanically debride remainder of debris at bedside with minimal discomfort*
- Black and Green Tissue Decrease 33%
- Pink and Red Tissue Increase 24%
- DC hospital day 23

Case 4 – Cannulation site skin erosion wound

- 54-man PMHx of nephrotic syndrome s/p LDRT and splenectomy, CKD, HLD admitted with mixed septic and cardiogenic shock secondary to Strep pneumoniae bacteremia.
- ICU course notable for DIC, respiratory failure s/p trach, s/p BLE BKA, s/p BL UE amputation, shingles, and ECMO Cannulation and Decannulation to Groin
- ECMO Decannulation Sites with diffuse slough and nonviable tissue within wound beds. CT surgery team deferring surgical debridement d/t large vessel involvement under slough.
- WOUND CARE TREATMENT GOALS: to gently debride slough from wound bed without the need of surgical debridement, with the help of the new NCG dressing to avoid the risk of vascular damage to vessels underneath



- Total of 7 NCF dressing applications, discontinued after sufficient lifting of slough from wound bed with improved granulation

After 7 Applications:
- *Able to mechanically debride some of slough
- at bedside on 3/15 with minimal discomfort*
- Black Yellow and Green Tissue Decrease 93%
- Pink and Red Tissue Increase 93%
- Care is ongoing, wounds 90% healed in 4 weeks

Case 5 – Non healing wound around chest tube

- 14-yo male with Ewing's Sarcoma
- Non healing wound from chest tube after surgery in January 2024
- Undergoing chemo and radiation
- Used enzymatic and autolytic debridement first

Figure 5A

Figure 5B

Figure 5C

Development of the sloughy chest tube wound

Figure 5D

Figure 5E

Figure 5F

Removal of slough with application of two dressing dressings

CONCLUSION

The results we obtained within a US setting is highly replicative of the slough removal results that is seen in peer reviewed publications on this Negatively Charged Fiber (NCF) dressing use in other continents. We have concluded that this dressing is now to be included in our toolbox when sharp debridement is not called for.
It can also be used, perhaps as an adjunct to sharp debridement, because in our observation slough levels steadily decreased over time and thus the dressing is true to its stated feature of supporting maintenance debridement of slough. We note the speed with which the slough is physically pulled away or removed is quite unique in our experience. We also note that much of the slough is visible on the dressing during dressing changes.

*NCF Dressing = UrgoClean Ag Dressing

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