The Use of Current Generating Dressings under Negative Pressure

BAYLOR Specialty Hospital

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Typically, interface materials between tissue and open celled reticulated foam (OCRF) under negative pressure wound therapy (NPWT) decrease the rate of granulation tissue formation by reducing micro strain at the cellular level. This technique is used to reduce pain that can be associated with OCRF. Current Generating Dressings (CGD) promote wound healing by producing a sustained current. The silver component of the dressing provides an antimicrobial property. This case series was designed to evaluate effects of CGD under NPWT and potential additive effect on tissue quality and rate of contraction. Each case received CGD to half of the wound under NPWT.

Case 1 was a large post-surgical wound from an abscess. An interface was used to enable patient to tolerate pain associated with removal of ORCF. Previous interfaces interfered with stimulation and allowed pooling of drainage under NPWT. The wound contracted 48% on the CGD side, compared to 39.5% on NPWT only side. Also striking was the patient's improved tolerance for dressing change with a reduction of narcotic use. **Case 2** was a traumatic wound surgically debrided with exposed hardware. Volume contracted initially 67.53% and area 45.88%. After placement of a GCD, the wound became too dry under NPWT and the wound closure rate decreased to 29.01% in area. Volume continued to contract by 76.34%. NPWT was discontinued and a more occlusive dressing was applied over the CGD, subsequently increasing closure to 82.085 in volume and 59.69% in area. **Case 3** was a surgically debrided state IV pressure ulcer. Initial healing rates were -6.48% in area and -24.23% in volume. After placement of CGD, the treated half contracted 34.41% in area and 56.28% in volume. The control half contracted 22.69% in area and 30.43% in volume.

Case 1

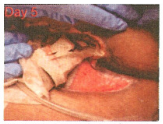
54 y/o diabetic female, s/p surgical I&D of inferior breast abscess

NPWT/silver OCRF

Left: NPWT/silver OCRF
Right: CGD/NPWT/silver OCRF

NPWT tract pad placement

Left: NPWT/silver OCRF
Right: CGD/NPWT/silver OCRF



Patient reported significant decrease in pain with dressing removal.

Stimulated tissue under CGD

Reductions	NPWT	CGD/NPWT
VOLUME	39.5%	48.0%
AREA	7.58%	16.21%

Wound closure percentages over 10 days.

Case 2

45 y/o male s/p R LE fixator from car bomb stabilized at outside hospital and presented with open w und over exposed hardware

NPWT/OCRF

Left: NPWT/OCRF
Right: CGD/NPWT/OCRF

Left: NPWT/OCRF
Right: CGD/NPWT/OCRF

CGD/silver non-adhesive foam

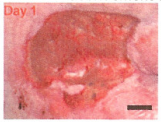
CGD/silver non-adhesive foam

Reductions	NPWT	CGD/NPWT	CGD Foam
VOLUME	67.53%	76.34%	82.05%
AREA	45.88%	29.01%	59.69%

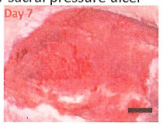
Wound closure percentages over 15 days.

Case 3

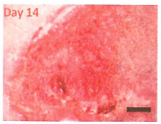
58 y/o male with tetraplegia and multiple pressure ulcers s/p surgical debridement of stage IV sacral pressure ulcer



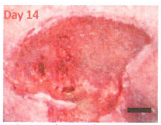
NPWT/silver OCRF



Left: CGD/NPWT/OCRF
Right: NPWT/silver OCRF



Close up of tissue under CGD



Left: CGD/NPWT/OCRF
Right: NPWT/silver OCRF

Reductions	NPWT	CGD/NPWT
VOLUME	-24.23%	56.28%
AREA	-6.48%	34.41%

Wound closure percentages over 14 days.

Each case illustrates a different wound type that benefited from the addition of a current generating dressing (CGD). Case 1 demonstrated the most dramatic improvement in pain management. IV pain medication was discontinued with dressing changes once the CGD was used as an interface which is why the patient was switched to the CGD ver the entire wound so quickly. The rapid epithelialization from the edges was the most notable wound change in case 1. Case 2 demonstrated the most dramatic improvement in tissue formation. The area of exposed hardware was covered with a thin layer of granulation tissue using NPWT and topical instillation of antibiotics. The progress stalled and a bioengineered tissue product with live fibroblast cells was applied. Unfortunately, the wound bed could not tolerate continued NPWT and the tissue product desiccated, including the area covered with the CGD. There was remarkable progress once the moisture level was properly managed with clear improvement over the area treated with the CGD. Case 3 demonstrated both a significant reduction in volume as well as area despite the fact that this patient had multiple co morbidities and the wound, though surgically debrided several weeks prior, was present for several months. This patient expired from respiratory issues.

Typically any interface that blocks microstrain at the tissue level from the OCRF would be expected to decrease results. The most surprising result of this case series was the lack of interference with NPWT and the actual additive effect noted in almost all situations. The ability of this CGD to stabilize the wound for STSG, reduce pain with dressing changes, granulate over exposed hardware and to contract overall dimensions potentially reduces overall length of stay as well as improving patient outcomes.

OCRF: Open Celled Reticulated F am by KCl; NPWT: Negative Pressure Wound Therapy by KCl; CGD: Current Generating Dressing: Procellera; Bioengineered tissue: Dermagraft