Efficacy of a Disposable Hydrodebridement System* for Debridement of Burn Wounds: a Retrospective Case Series

Candice Cotton, RN, MSN, CWON, CFCN and Cynthia Towers McCombs, BSN, RN, CWON, CFCN

Huntsville Hospital Outpatient Wound Clinic
Demonstrate the effectiveness of an underutilized disposable hydrodebridement system* in 2nd degree burns

Debridement is a necessary component of wound bed preparation to stimulate wound healing

- Removes necrotic tissue
- Reduces bioburden
- Stimulates granulation tissue formation

Most debridement methods are not ideal for burn patients due to technological limitations

- Debridement is typically painful and causes anxiety for patients
- Potential to damage healthy granulation tissue
- Some methods require a dedicated room or OR suite

Portable Disposable Hydrodebridement System* addresses technological limitations of other advanced debridement systems

**System Components:**
- Disposable wand and tubing
- Bag of saline
- Pressurized oxygen (9 – 15 L/min)

Aerosolizes saline with oxygen at safe pressures between 4 and 12 PSI

- Micro drop diameter: 5 – 100 μm
- Velocity: 200 m/s
- Requires only 1.5 ml/min of saline

System is cost effective

**methods**

Study approved by Huntsville Hospital Institutional Review Committee

- Included all patients with burn wounds that received hydrodebridement between May 2013 – June 2014
- 22 patient records included (50 wounds)
- 8 patient records excluded due to incomplete data
- Age range: 14 months – 61 years old

Patients received hydrodebridement therapy 1 – 3 times a week until hydrodebridement was no longer indicated

- Primary dressings: Silver Sulfadiazine (n=18), Zinc Oxide (n=2), Bacitracin (n=2)

Wounds were photographed, measured, and characterized for presence of necrotic tissue and slough at each visit

Modified Kaplan-Meier Survival Curves used to determine probability of complete granulation and probability of healing or hydrodebridement no longer indicated

- Log-rank test and Cox regression used to analyze influence of age and sex covariates
## Representative Cases

### case 1 - 2nd degree scald burn on right hand of 16 yrs. Female

<table>
<thead>
<tr>
<th>Day 0 - Pre</th>
<th>Day 0 - Post</th>
<th>Day 6 - 3 Sessions</th>
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### case 2 - Contact 2nd degree burn on left hand of 17 yrs. Male

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<thead>
<tr>
<th>Day 0 - Pre</th>
<th>Day 0 - Post</th>
<th>Day 7 - Post</th>
<th>Day 12 - Post</th>
<th>Day 38 - 4 Sessions</th>
</tr>
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- Note effective removal of silver sulfadiazine with hydrodebridement system

### case 3 - 2nd degree scald burn on right foot of 8 yrs. Female

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<tr>
<th>Day 0 - Post</th>
<th>Day 2 - 2 Sessions</th>
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- 90% epithelialization of wound after 2 days
Hydrodebridement Stimulates Granulation Tissue Formation

- **Hydrodebridement induces complete coverage of wound bed with granulation tissue.**
  - Median: 6 days; Range: 1 – 30 days
  - Patient age and gender do not significantly influence time to complete granulation tissue coverage.
  - Cox Regression Analysis: Age p = 0.056; Sex p = 0.296
  - Log Rank Test: Age p = 0.069; Sex p = 0.33

Discussion

**Disposable Hydrodebridement System** effectively removed wound debris and foreign materials

- Highly effective at removing excess silver sulfadiazine or zinc oxide ointment (Case 2)

Effective for a diverse patient and wound population

- Burn wound types: scald, contact, chemical, flame
- Combination wounds (i.e. burn and abrasion, Case 2) effectively treated
- Rate of granulation tissue formation not effected by patient age

**Minimal to no pain reported by patients or observed by nurses during hydrodebridement sessions**

- Saline stream reported by patients to have cooling effect
- Well tolerated by young patients with little to no resistance

Easy to use and required minimal set-up

- Minimal staff education required to safely perform procedure
- Portability of unit allows debridement to be performed in examination room

Conclusions

- Disposable Hydrodebridement System is effective at debriding 2nd degree burn wounds
- Little to no pain experienced by patients during hydrodebridement procedures
- Rapid formation of granulation tissue demonstrates ability of hydrodebridement to stimulate wound healing

References


*Jetox® – ND Jet Lavage Wound Cleansing and Debridement System
DeRoyal Industries Inc, Powell TN*