

# Second-Degree Burn Care with a Lactic Acid Based Biodegradable Skin Substitute in 229 Pediatric and Adult Patients

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## OBJECTIVES

- Evaluate 229 patient cases
- Discuss outcome measures for second degree burns
- Understand different treatment options for second degree burns
- Compare outcomes after different treatments for second degree burns
- Evaluate Cost of different treatment options for second degree burns



## ABSORBABLE SYNTHETIC MEMBRANE

### Positioning in the Treatment of Wounds

superficial 1 - 2a <sup>o</sup>	superficial dermal 2a <sup>o</sup>	deep dermal 2b <sup>o</sup>	dermal subcutaneous 3 <sup>o</sup>
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- Alginates
- Hydrofibres
- Hydrogels
- Foam dressing
- Hydrocolloids
- Film dressing
- Cadaver-based scaffolds
- Split-thickness skin grafts
- Mesh-graft transplantations
- Cultured epithelial autografts (CEA)
- Acellular grafts
- Dermal substitutes

Lactic Acid Membrane

### Properties

Composition	Lacto-capromer, main constituent: Polylactic acid
Degradation	4 weeks (hydrolytically)
Plasticity	>200% elongation at break
Permeability to water vapor	40 - 70 ml/m <sup>2</sup> (hour approx. 1.000 - 1.700 per day)
pH	5.5 (initial) => 4.0 <i>in vitro</i>

## STUDY DESIGN

- Retrospective chart review
- 2nd degree wounds (2A and 2B)
- Patient received wound debridement under sedation/ anesthesia and absorbable synthetic lactic acid based membrane was placed (= standard care)
- Study period: 9/1/2013 – 12/31/2016
- IRB approval was obtained

## OUTCOME PARAMETERS

- Demographics
- Size of Burn
- Time to healing
- Pain (average)
- Infection
- Failure (required removal/grafting)
- Hypertrophic scarring

## PROCEDURE

- Dermabrasion (in OR) or rough debridement (under sedation) of wound
- Rinse with sterile saline
- Dab dry
- Apply (absorbable lactic acid) membrane
- Cover with Vaseline gauze
- Cover with bridal veil (Dermanet®, N-terface® ...)
- Cover with absorbent gauze
- Cover with Ace® bandage or Coban® or surgical netting
- Change outer dressing every 1-4 days down to bridal veil
- Remove when healed



## RESULTS - Demographics

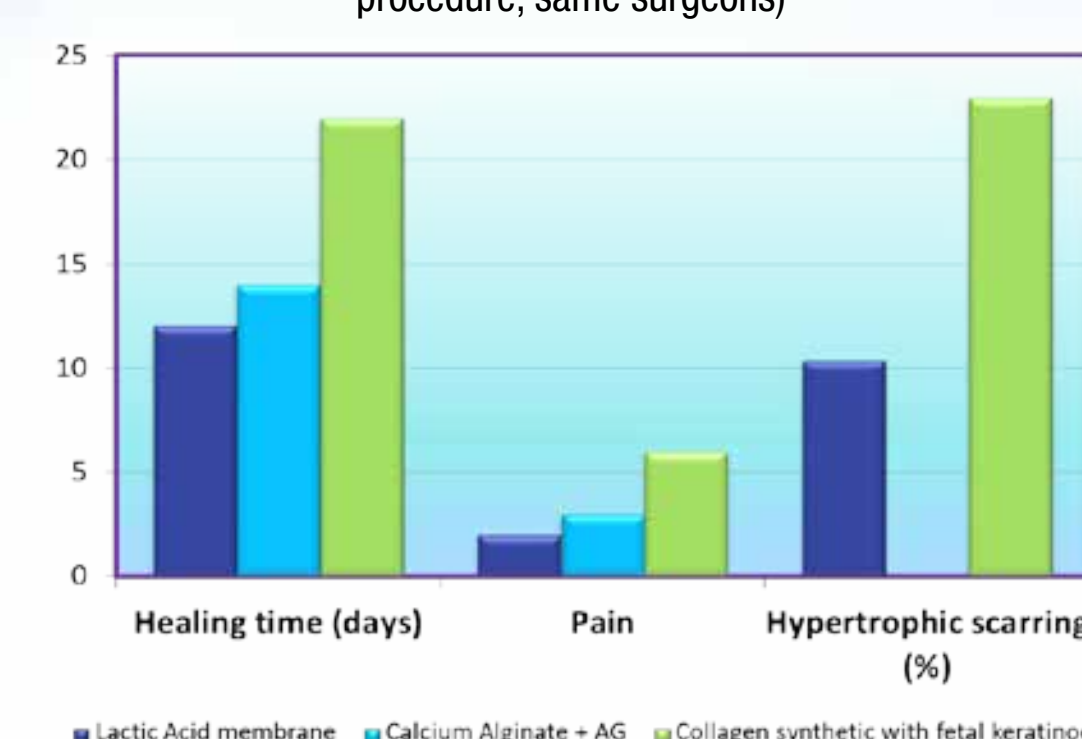
- 229 patients, 474 applications, for Burns
- 88 female/ 141 male
- 138 pediatric
- Average age 20 years (9 weeks to 73 years)
- Average Burn size 8.6 %TBSA (1-60.5)
- Placed in OR/BC 158/71
- 220x2nd degree, 5x3rd degree, 4x indeterminate depth

## RESULTS

- Average time to healing - 14.2 days
  - Pediatric: 12.4 days
  - Healing time determination for outpatients prolonged because of link to appt.
- Average pain level throughout - 1.7/10
- Areas of infection - 3.5%
- Area of progression to FT 5/229 - 2.24%
- Some hypertrophic scarring - 12%
  - 10.1% pediatric, 14.3% adult;
  - 4.3% of BC applications vs 15.2% OR applications, probably because of deeper burns being applied in the OR



Comparison Lactic Acid Membrane, Collagen Synthetic Membrane with Fetal Cells and Calcium Alginate +AG on Donor Sites own data, same basic procedure, same surgeons)



## CASE STUDY

9 week old with 26% TBSA

Membrane applied 5 hours after burn after dermabrasion

Staph aureus pneumonia  
Extubation day 7  
Discharge home day 13



## COLLAGEN MEMBRANE WITH CELLS COST 3% TBSA

- Sedation Debridement - 2500\$
- Membrane - 900\$
- Silver and gauze outer dressing - 60\$
- Change outer dressing every 3 days x5 - 300\$
- 1 Nursing time average 5 hours - 400\$
- Healing in 15 days - 4100\$

## OINTMENT DRESSINGS 3% TBSA COST

- Sedation Debridement - 2500\$
- Ointment 50\$ /3000\$ (3 days per tube)
- Vaseline and gauze outer dressing - 20\$
- Change outer dressing every day x15 - 300\$
- Nursing time average 5 hours - 400\$
- Healing in 15 days - 3250\$/6200\$ (or 3700\$ without debridement when using collagenase)

## LACTIC ACID ABSORBABLE MEMBRANE 3% TBSA COST

- Sedation Debridement - 2500\$
- Membrane - 300\$
- Vaseline/-Gauze outer dressing - 20\$
- Change outer dressing every 3 days x5 - 100\$
- Nursing time average 1 hours - 80\$
- Healing in 15 days - 3000\$

## CONCLUSION

- Lactic Acid membrane is a competitive second degree burn treatment option
- Lactic Acid membrane treatment has a low infection/failure rate when applied onto a vital and clean wound bed
- Lactic Acid membrane coverage decreases the systemic inflammatory response and fluid loss when applied within the first 2 days post burn, especially in children
- Lactic Acid membrane coverage is patient friendly (less pain, less dressing changes)
- Lactic Acid membrane coverage of 2nd degree burn wounds is cost neutral or effective, depending on what other dressing option is used