

# Single-stage biomatrix and skin graft under a single-patient portable negative pressure wound therapy (NPWT) device decreases hospital costs

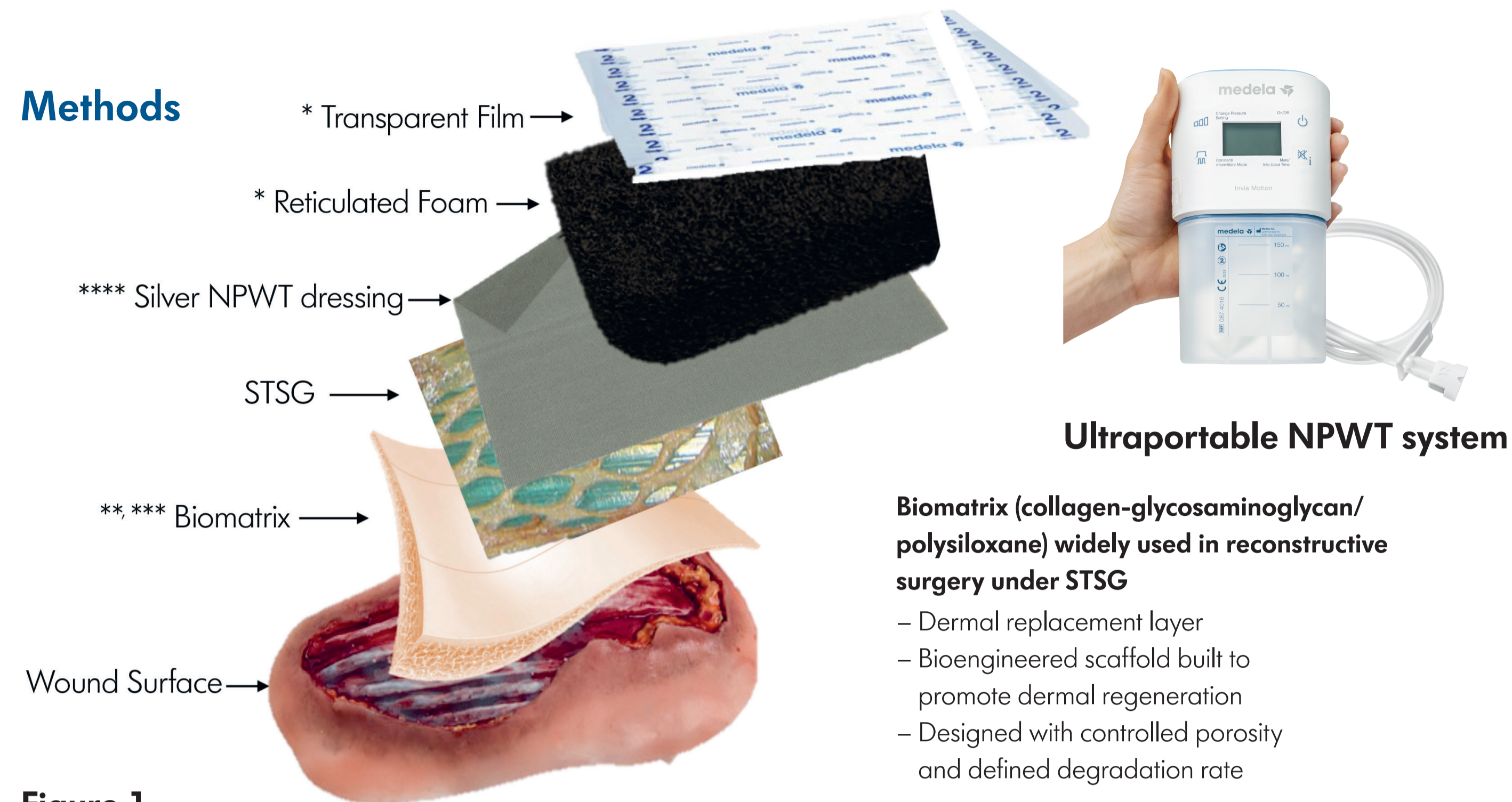
Charles K Lee, MD; Nakyung Kim, MD; Gina Restani, ORT; Tina Lin, RN

L plastic surgery, San Francisco, CA

## Introduction & Aim

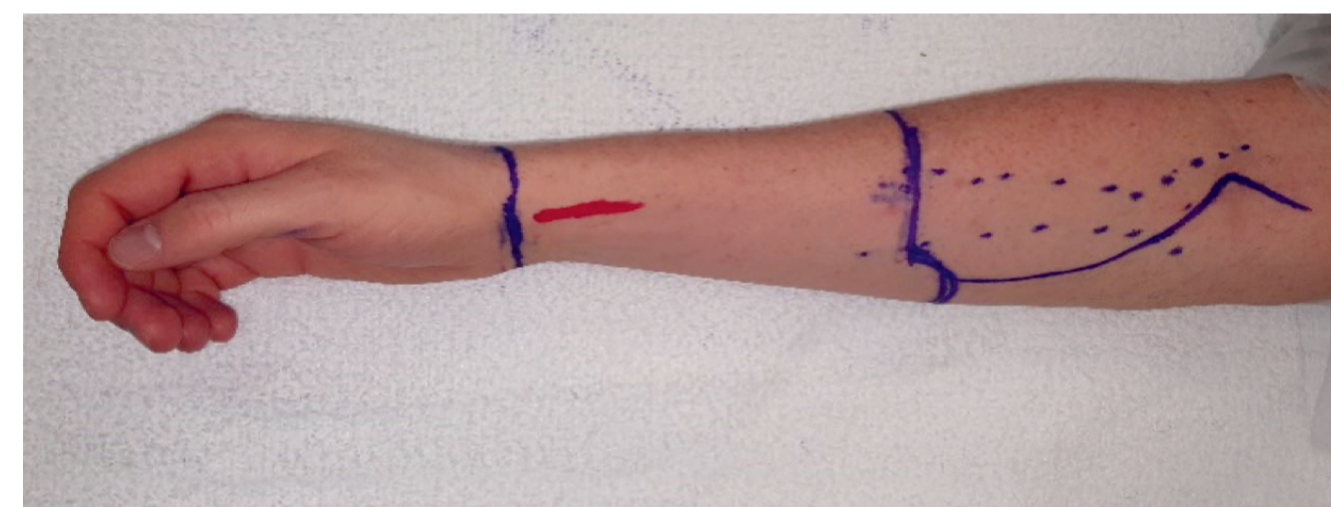
We assess the economic impact on total cost of therapy when using a single-stage, single-patient NPWT\* system over an advanced Biomatrix\*\* and skin graft for accelerating the wound healing process by avoiding a second operation and evaluating ease of transition from inpatient to outpatient status. Advanced Biomatrix\* under NPWT is normally performed as a 2-stage procedure, with one operation to place the Biomatrix\* under NPWT, and then a second operation performed in 3 weeks for the Split Thickness Skin Graft (STSG) under NPWT.

The current study shows, a single-stage technique results in 10 consecutive patients.

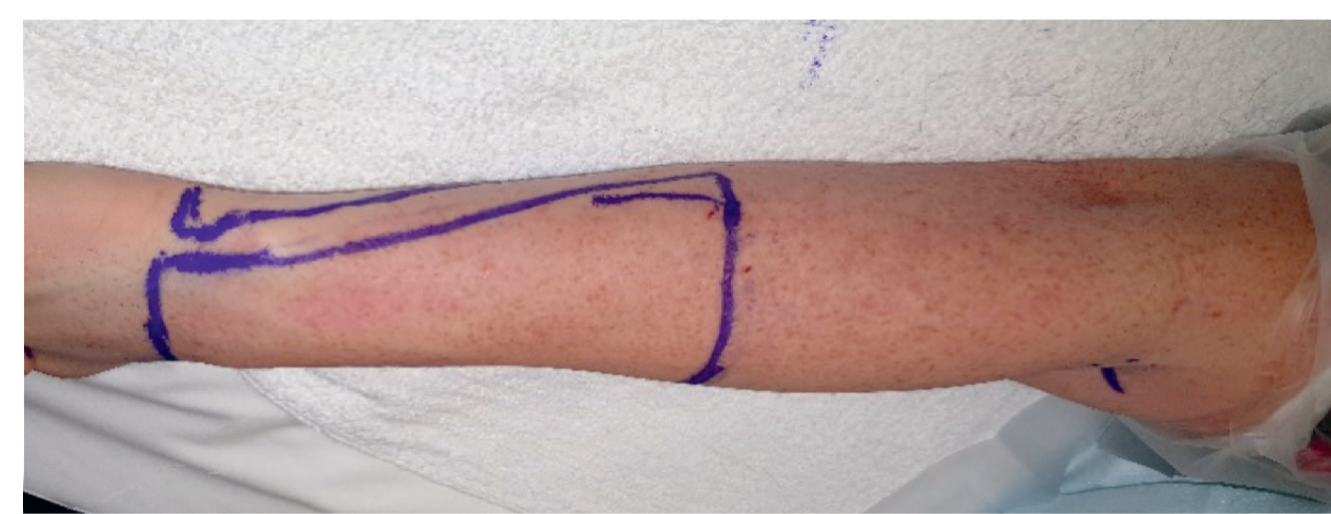


**Figure 1**  
Biomatrix\*\*, STSG, and NPWT\* (-125mmHg) and interface layer\*\*\*\* were used to reconstruct large radial forearm flap donor sites. Wound and Graft Size, STSG/biomatrix take, therapy duration, hospital length of stay (LOS), and infection rate were assessed on a series of 10 consecutive patients.

## Management: Reconstruction of large forearm flap donor site

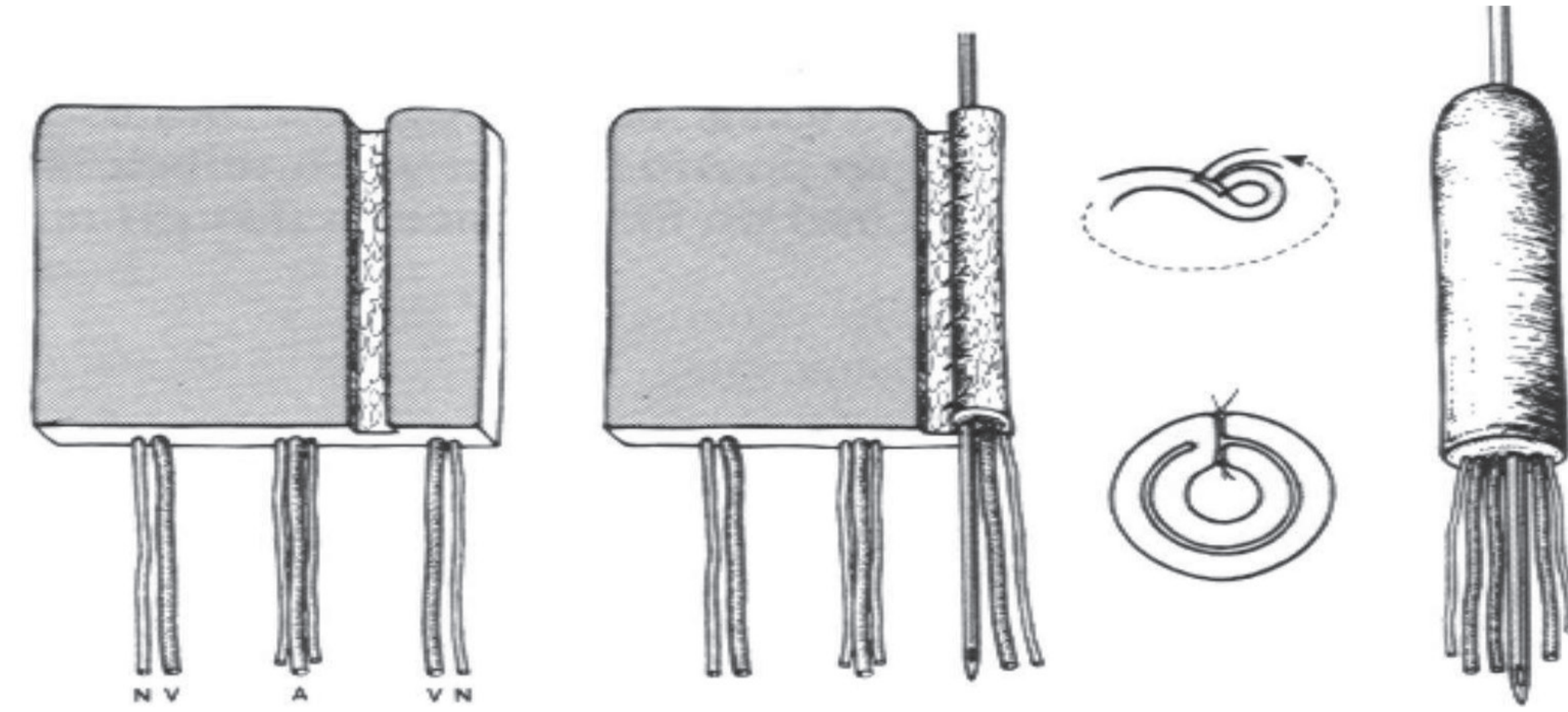


**Figure 2 A**

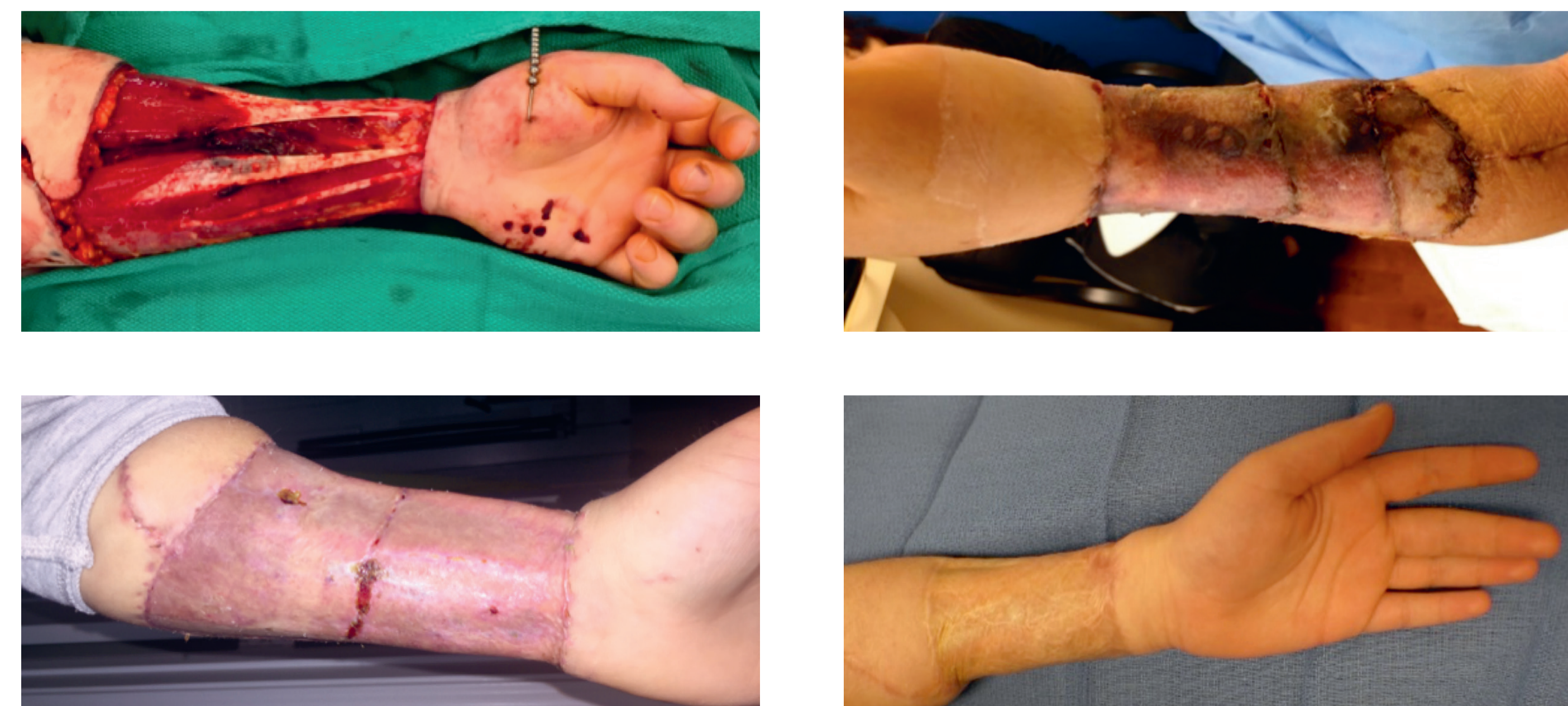


**Figure 2 B**

## RADIAL FOREARM PHALLOPLASTY: TUBE WITHIN A TUBE



A large skin surface area was needed for phalloplasty, taken from the forearm (Figure 2A and 2B). This was used to construct a "Tube within a Tube".



**Figure 3 (A-D)**

## Radial Forearm Donor Site

### Advantages

#### Aesthetics

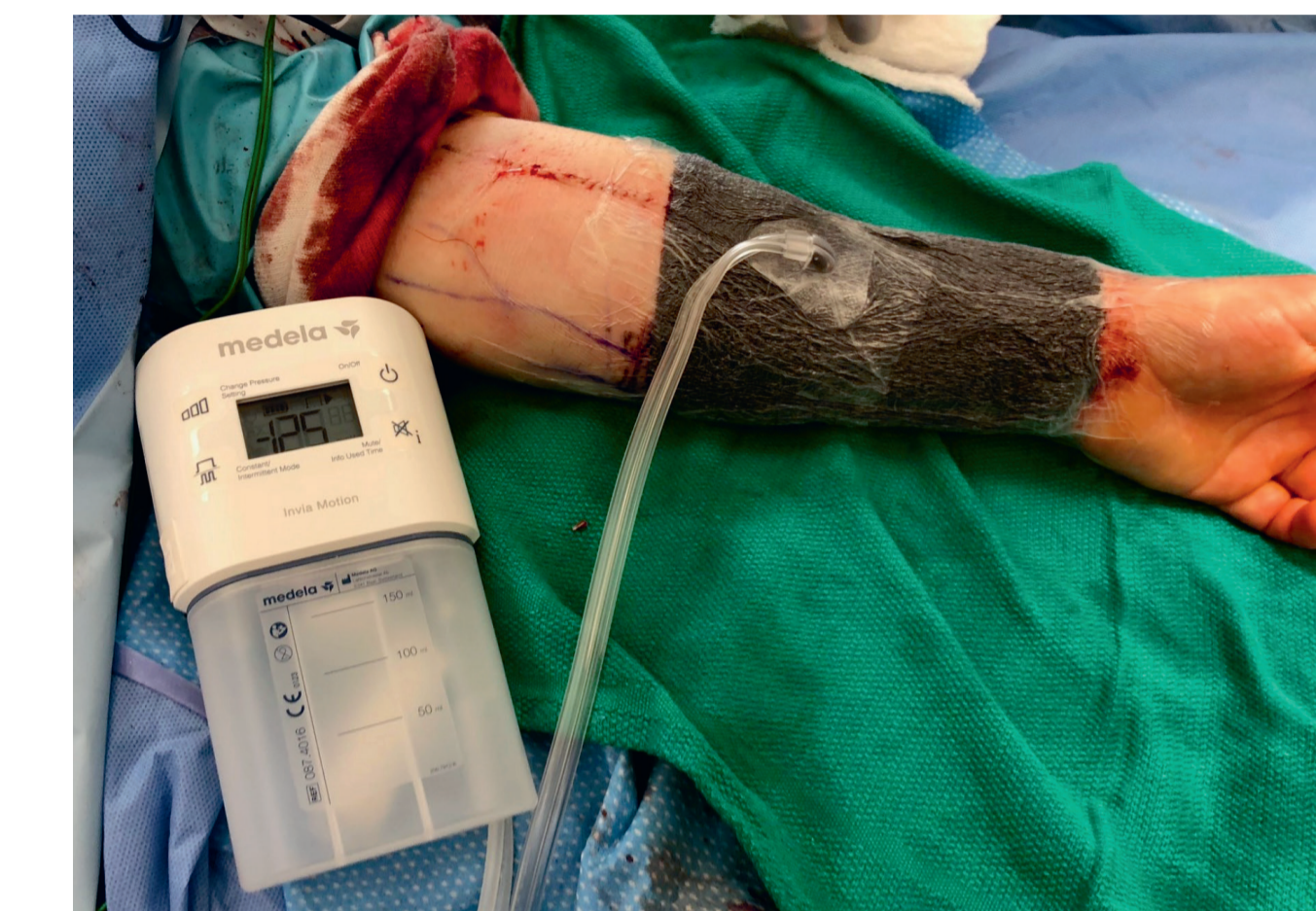
Thin Skin  
Color

#### Function

Tendon Gliding  
Protection over RSN  
Take of STSG/Wounds

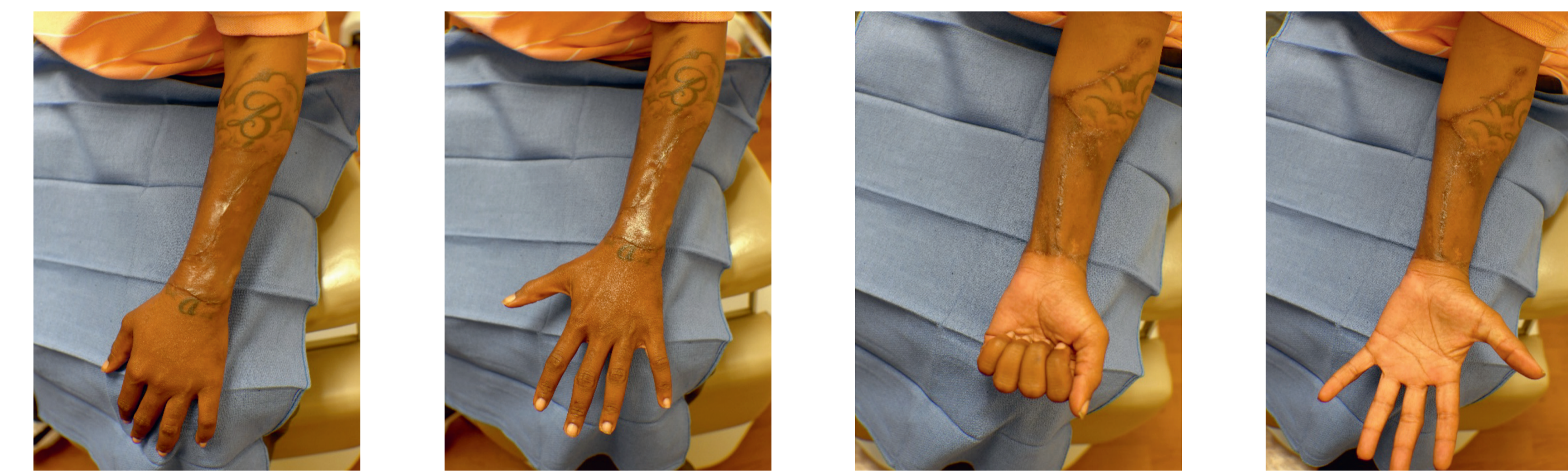
## Unique NPWT System

Biomatrix\*\*\*, STSG, and NPWT\* (-125mmHg) were utilized in patients for complex radial forearm free flap donor site reconstruction in a single-stage procedure. We assessed the cost stemming from the single stage-procedure versus the standard 2-stage procedure.



**Figure 4**  
Ultra portable device and NPWT dressing

## Results: Improved cosmesis and function



**Figure 5 (A-D)**

**Table 1: Radial Forearm Donor Site Management Cost Comparison**

	Standard Protocol	New Protocol
<b>Operation 1</b>	Biomatrix + NPWT	Biomatrix + STSG + NPWT
<b>LOS (days)</b>	5 - 7(\$)	5
<b>Cost of Hospital stay</b>	\$1,500 x 5days = \$7,500	\$1,500 x 5days = \$7,500
<b>(S) Potential Cost of delay in discharge of patient to obtain home NPWT (1-2 days)</b>	<b>Estimated Cost \$1,500/day</b>	No delay: patient discharged with the Single Use, Portable NPWT applied in the hospital
<b>Outpatient STSG surgery</b>	POD 14 days	No
<b>Operations</b>	2 separate	1
<b>Costs of Additional Outpatient Surgery, Hospital, Surgeon &amp; Anesthesia Fees</b>	<b>\$10,000</b>	No second surgery required
<b>Total NPWT (days)</b>	21	10 - 14 (mean 12)
<b>Results</b>	Good	Good
<b>Total Costs</b>	<b>\$17,500 - \$20,500</b>	\$7,500
<b>Added benefits</b>	-	* No painful removal of NPWT * Uninterrupted NPWT * Patient satisfaction +++ * <b>Significant cost savings (\$10,000 - \$13,000)</b>

## Results and Conclusion

The patients that were treated with single-stage Biomatrix\*\*, STSG and NPWT therapy\*\*\*\* were all discharged on post-operative day 5.

It was evident that an easy transition from inpatient status to outpatient/home setting could be achieved.

The NPWT device could be removed within 10-14 days and the mean graft take is 98% with no infections. The second operation was not necessary for STSG resulting in

**\$10,000 to \$13,000 cost savings.**

The single-stage procedure can be considered a superior and costeffective alternative to the current 2-stage procedure.

Moreover, no skin staining was observed when using the antimicrobial wound contact layer\*\*\*\* together with the NPWT system\*.

## Notes:

Product notation:  
\* Invia® Motion™ NPWT system,  
\*\* Integra® Mono Layer (Thin) Wound Matrix,  
\*\*\* Integra Bi Layer Wound Matrix,  
\*\*\*\* Invia Silverlon

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Although the manufacturer's instructions for use with the NPWT system\* recommends a dressing change every 48-72 hours, the primary researcher in this study has been investigating extended times between NPWT dressing changes in the management of wounds and has experience with extended dressing change times together with an antimicrobial wound contact layer\*\*\*\* and therefore applied extended dressing change times commensurate with this experience.

Correspondence: lplasticsurgery@gmail.com

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