

Autologous Skin Cell Suspension May Enhance Healing of Burn Wounds and Skin Graft Donor Sites in Elderly Burn Patients

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Introduction

An autologous skin cell suspension (ASCS) containing keratinocytes, fibroblasts, and melanocytes can be processed from a small split thickness skin sample for use at the point-of-care in the operating room. ASCS have been shown to facilitate epidermal regeneration in large TBSA partial thickness burns with minimal donor site morbidity.

Aim

We aim to test the efficacy of ASCS in conjunction with split thickness skin grafting to enhance healing in the elderly burn population.

Hypothesis

We hypothesized that ASCS in conjunction with a 3:1 split thickness skin graft could be used to facilitate healing in a 95 year-old female otherwise healthy burn patient with 12% TBSA deep partial and full thickness scald burns to the abdomen and bilateral thighs. To our knowledge, she is the oldest patient to undergo epidermal autografting with ASCS.

Methods

STAGE 1: ReCell Skin Processing

- Take skin sample**
 - Take thin, split thickness shave biopsy (0.15-0.2 mm in depth).
- Heat Enzyme**
 - Run test again by pressing (7)
 - When (7) shows, press play (▶) button to heat the Enzyme
- Incubate skin sample**
 - When orange light (■) changes to (■), insert skin sample into incubator well for 15 minutes
- Draw up Buffer Solution**
 - Using a 5 mL syringe and blunt needle draw up appropriate volume of Buffer Solution from well B

Treatment Area	Buffer Solution Volume
Up to 80 cm ²	1.5 mL
80 cm ² - 150 cm ²	2.5 mL
150 cm ² - 200 cm ²	4.5 mL

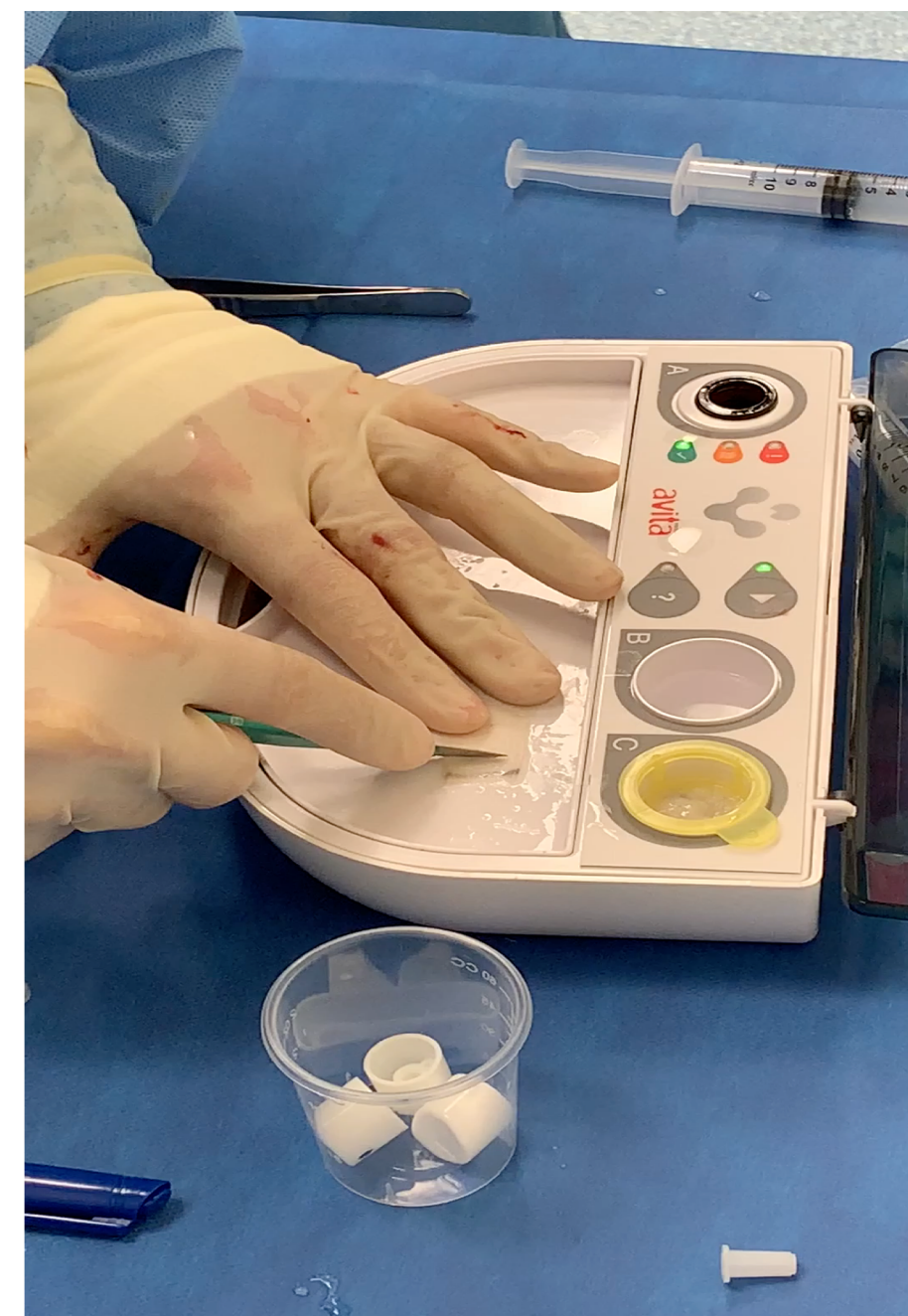
STAGE 2: ReCell Suspension Preparation

- Test scrape**
 - Remove skin sample from incubator and place on tray
 - Gently scrape to test if the cells disaggregate. DO NOT complete scraping
 - If cells do not come away - incubate for a further 5-10 minutes and repeat step
- Deactivate ReCell Enzyme**
 - Rinse skin sample briefly in well B
- Scrape cells**
 - Place skin sample on tray dermal side down
 - Using Buffer Solution in the 5 mL syringe, place a few drops onto the skin sample
 - Scrape thoroughly to disaggregate cells
- Rinse and Aspirate**
 - Add remaining Buffer Solution from the 5 mL syringe onto the tray using the solution to rise the scalpel and tray into one corner
 - Using the 5 mL syringe and blunt needle, aspirate the cell suspension and again rise the tray into one corner

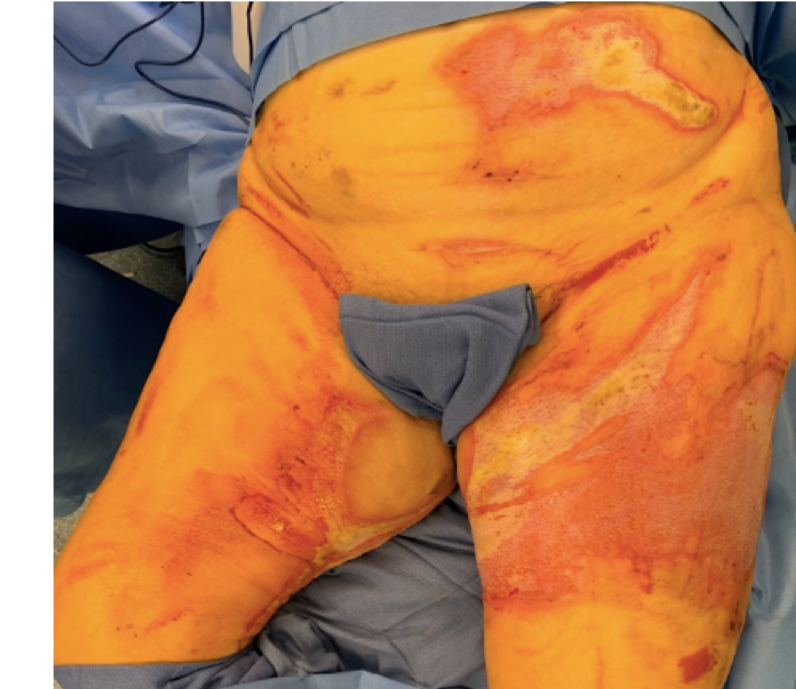
STAGE 3: ReCell Suspension Delivery

- Filter cells**
 - Filter cell suspension through well C
 - Remove cell strainer
 - Tip cell strainer over well
- Draw up ReCell suspension**
 - Use a new sterile 5 mL syringe with blunt needle draw up ReCell suspension from well C
- Dressings**
 - Ensure the dressings are cut and prepared for immediate application once the cell suspension is applied
- Apply ReCell suspension to wound bed**
 - If spraying, connect spray nozzle to the syringe
 - If dripping, leave blunt needle in place

Cell Volume	Recommended Application Method
1.5 mL	Drip
2.5 mL	Spray or Drip
4.5 mL	Spray



Results



Discussion

We demonstrate that ASCS enhanced rate of re-epithelialization of burn wounds in a 95 year-old patient compared to our experience with skin grafting alone in this population. ASCS also promoted complete healing of the donor site by POD 10. This technology may have an important role in decreasing healing time in the geriatric burn population. These findings are important for this population as longer lengths of stay are associated with delirium, hospital acquired infections, and deconditioning.