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An automated and minimally invasive tool harvests viable epidermis capable of cellular outgrowth using a bench skin model

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An epidermal harvesting tool that makes epidermal grafting possible in an outpatient setting with minimal donor site damage has recently been described. The technique involves a device that applies both heat and suction concurrently to normal skin over time to induce epidermal graft formation. In order to investigate the biological mechanims of epidermal graft formation and transfer, a bench model for creating and harvesting grafts was developed. In this study, detached human abdominoplasty or cadaveric skin was used as a model of epidermal graft formation and adhesion. Graft adhesion was assessed using an open-mesh silicone dressing and a transparent film dressing to transfer grafts obtained from various anatomical locations. The study results showed that epidermal grafts were created after approximately 18-75 minutes on, both, unfrozen and previously frozen cadaveric skin that was stretched onto a supporting surface. Different anatomical locations showed variable graft formation times. The grafts were tested for viability and results showed that detached epidermal skin obtained 24 hr post-mortem was viable, but lost viability when obtained 48 hr post-mortem. Abdominoplasty skin was viable and capable of cellular outgrowth in culture. These results showed that cadaveric skin, although not a suitable model for testing epidermal cell outgrowth after harvest, is a suitable model for studying epidermal graft formation and harvesting techniques using various advanced approaches.

Biography

Sandra N Osborne is a tissue culture specialist in the Department of Device Sciences, headquartered in San Antonio's KCI R&D facility. She obtained a PhD from the University of California at San Diego, and has over 20 years of experience as a research scientist. Her published record covers topics in epigenetic silencing and cellular response in organisms ranging from yeast to humans. During her tenure at KCI, she has executed research that elucidated mechanisms of action for a number of products including: CelluTome™, an epidermal micrografting tool; Graftjacket®, an acellular dermal matrix and V.A.C® on multiple patient stem cell populations.

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