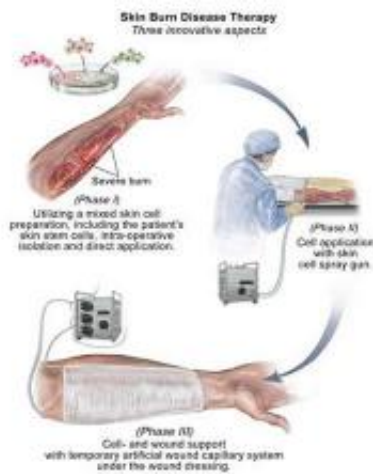


Skin-cell spray gun drastically cuts healing time for burns

February 8 2011, by Lin Edwards



(PhysOrg.com) -- Scientists in the US have developed a new technique that sprays a burn patient's own cells on the burn to help regenerate the skin and drastically reduce recovery time. The gun has been under development since 2008 and has now been used to successfully treat more than a dozen patients.

The Skin-cell Gun works essentially like a sophisticated paint spray gun. It was developed by Professor Joerg C. Gerlach and colleagues of the Department of Surgery at the University of Pittsburgh's McGowan Institute for Regenerative Medicine. The concept was first introduced in

2008.

Until now burns have usually been treated with skin grafts, which involve taking skin sections from uninjured parts of the patient's body, or growing sheets of skin artificially, and grafting them over the burn. The grafts can take several weeks or even months to heal, and during the recovery period patients are prone to infections because of the damage to the skin, which is the body's first line of defense against pathogens.

Scientists have been able to regenerate skin in the laboratory for decades, but the process takes two to three weeks and the sheets of skin produced are fragile. When grafted on, blisters can form beneath it due to secretions, and can push up against the sheet and damage it.

Skin spraying have been in use for some time elsewhere, such as in Australia, where Dr Fiona Wood of the West Australia Burns Unit developed a method called "spray-on-skin." Dr Wood's method uses an aerosol system to spray on cultured skin cells. This system also cuts healing time to days rather than weeks or months, and the technique substantially cut the death toll in the Bali bombings in 2002.

Dr Gerlach said the new method uses an electronically controlled pneumatic device that does not injure the cells, while the other skin spraying devices are hand-pumped atomizers.

In a process taking only an hour and a half in total, a biopsy is taken from the patient's undamaged skin and then healthy stem cells are isolated from the biopsy and an aqueous solution containing the cells is sprayed on the burn.

The sprayed wound is then covered with a newly-developed dressing with tubes enmeshed within it and extending from each end. One set of tubes functions as an artery, while the second set functions as a vein. The

tubes are connected to an “artificial vascular system” and provide electrolytes, antibiotics, amino acids and glucose to the wound. The dressing keeps the wound clean and sterile, and provides nutrition for the skin stem cells to encourage them to regenerate new skin.

After treatment the wound heals in just days, when it would have taken weeks to heal using traditional treatments. Dr Gerlach said patients had been treated at the Berlin Burn Center and they had regrown [skin](#) over a burned ear or an entire face in only a few days.

At the moment the technique can only be used on second-degree burns, but Dr Gerlach hopes it will later be able to tackle third-degree [burns](#) as well.

The research is funded by the US Department of Defense under the Armed Forces Institute of Regenerative Medicine (AFIRM) consortium of research institutions, which was formed in 2008 to research better treatments for wounded service personnel.

The Skin-cell Gun will be shown on the National Geographic channel in the episode Explorer: How to Build a Beating Heart, which looks at the latest tissue regeneration techniques.

More information:

www.mirm.pitt.edu/news/article.asp?qEmpID=614

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