CelluTome™ epidermal harvesting system for autologous skin grafting

TECHNOLOGY

CelluTome™ is a skin harvesting system that has been developed by Kinetic Concepts, Inc. The system cuts thin sections of epidermal skin for autologous skin grafting in patients with acute or chronic wounds, including diabetic foot ulcers, venous leg ulcers, pressure sores and skin cancers.

The CelluTome™ system uses a combination of suction and warmth to enable cell splitting within the skin by causing the formation of blisters (epidermal microdomes) on the skin surface. These microdomes consist of skin tissue (epithelium) and cells (keratinocytes) which are harvested into skin grafts (epidermal micrografts).

The CelluTome™ system consists of (i) a control unit, which regulates the suction pressure and temperature for raising the microdomes, (ii) a vacuum, which delivers the suction pressure and warmth to the harvester and (iii) a harvester, which provides the grid for microdome formation.

The harvester is positioned at the donor site on the patient's inner thigh and delivers pressure and warmth to initiate the microdome raising process. An array of 128 2mm wide microdomes form gradually over approximately 30-40 minutes. Complete microdome formation is confirmed by visual observation of microdomes with a raised height and encapsulating a clear fluid. The harvester then cuts the layer of skin with raised microdomes which is captured by 3M Tegaderm™ film dressing. The film dressing with attached microdomes creates a transferrable skin micrograft which should ideally be applied to the recipient site within two minutes of procurement. A Tegaderm film dressing is also placed at the donor site after harvesting. The company claim the entire procedure takes less than one hour and can be performed by a trained clinician, within the clinic setting.

The CelluTome™ system received a CE mark in April 2014 and was launched for private and NHS clinical use in May and June 2014, respectively.
POTENTIAL FOR IMPACT

Epidermal skin grafts use a minimal amount of autologous tissue from the donor site and offer an alternative to traditional autografts for closing a variety of chronic and acute wounds. Traditionally, epidermal skin grafting has had limited use in clinical practice due to its imprecise, invasive and time consuming nature, and the lack of a reliable, automated methodology. Clinical studies with epidermal harvesting have demonstrated growth factor and proliferative cell activity in microdomes.

According to the company, the CelluTome™ epidermal harvesting system harvests the donor site epidermis, including the keratinocytes, yielding microdomes that contain undamaged tissue for grafting to a recipient site. The company claim the CelluTome™ system is a minimally invasive, automated and reproducible process. The company state the CelluTome™ system offers a simplified method of graft application that requires less physical handling and may avoid graft orientation problems.

The company also claim a key innovative feature of the CelluTome™ system is the use of the suction based method of raising the microdomes. According to the company, this negates the need for anaesthesia and may also be associated with less pain, trauma and complications at the donor site. In addition to simplified post-operative care, the company claim patients can also undergo multiple epidermal grafts.

The company claim the CelluTome™ system has the potential to help patients with chronic or acute wounds achieve closure in less than four weeks, which may reduce costs related to treating chronic wounds.

If clinical and cost effectiveness can be demonstrated, the CelluTome™ system may offer an additional autologous epidermal skin grafting option for selected patients.

EVIDENCE

ONGOING STUDIES


The company report further studies and clinical trials of the CelluTome™ system are ongoing.

INFORMATION FROM

This Alert is based on information from the company and a time-limited internet search.