grafting currently requires the harvesting of autologous skin grafts from the same burn patient. Typically, the donor site on the burn patient is chosen in a non-burned area and a partial thickness sheet of skin is harvested from that area. Incumbent upon this procedure is the creation of a partial thickness skin defect at the donor site. Healing by re-epithelialization of the donor site is often painful and may be prolonged for several days. In addition, a visible donor site deformity is created that is permanently thinner and more de-pigmented than the surrounding skin. For patients who have burns over a significant surface area, the extensive harvesting of skin grafts from non-burned areas may also be limited. Thus, there is a need for instruments and procedures that eliminate this donor site deformity and provide the means to repeatedly harvest skin grafts from the same donor site.

INCORPORATION BY REFERENCE

Each patent, patent application, and/or publication mentioned in this specification is herein incorporated by reference in its entirety to the same extent as if each individual patent, patent application, and/or publication was specifically and individually indicated to be incorporated by reference.

SUMMARY OF INVENTION

A first aspect of the present invention provides a method comprising, applying a scalpet array to a target skin site, wherein the scalpet array comprises a plurality of scalpets positioned on an investing plate, wherein the investing plate is a perforated plate. The method comprises circumferentially incising skin pixels at the target skin site by applying a load via the scalpet array onto subjacent skin surface that includes the target skin site, capturing a plurality of incised skin pixels on an adherent substrate, wherein the incised skin pixels are extruded through the scalpet array, and transecting bases of incised skin pixels extruded through the scalpet array.

A second aspect of the present invention provides a system comprising, a scalpet array comprising a plurality of scalpets secured on an investing plate, wherein the scalpet

array is configured for application to a skin surface, a loading member, wherein the loading member is configured to apply via the scalpet array a load onto the skin surface subjacent the scalpet array, an adherent substrate configured to capture incised skin plugs extruded through the scalpet array as a result of application of the load, and a cutting member, wherein the cutting member transects bases of the incised skin plugs extruded through the scalpet array.

A third aspect of the present invention provides a system comprising, a scalpet array comprising a plurality of scalpets secured on an investing plate, wherein the scalpet array is configured for application to a skin surface, and an adherent substrate configured to capture incised skin pixels extruded through the scalpet array as a result of application of a load onto the skin surface subjacent the scalpet array, wherein the scalpet array is independent of the adherent substrate.

A fourth aspect of the present invention provides a system comprising, a scalpet array comprising a plurality of scalpets fixed on a sleeve, wherein the sleeve is configured to be removeably coupled to and carried on a component of a dermatome, and an adherent substrate configured to be positioned on the component adjacent the sleeve, wherein the adherent substrate is configured to capture incised skin pixels extruded through the scalpet array as a result of application of a load to the scalpet array.

A fifth aspect of the present invention provides a system comprising, a scalpet array comprising a plurality of scalpets fixed on a sleeve, wherein the sleeve is configured to be removeably coupled to and carried on a component of a dermatome, and an adherent substrate, wherein the adherent substrate is configured to be removeably coupled to and carried on the component, wherein the adherent substrate is configured to capture skin pixels generated by application of the scalpet array to a skin surface.

BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 shows a Pixel Array Dermatome (PAD) Kit placed at a target skin site, under an embodiment.

Figure 2 is a cross-section of a PAD Kit scalpet, under an embodiment.

Figure 3 is a partial cross-section of a PAD Kit scalpet, under an embodiment.

Figure 4 shows the adhesive membrane with backing of a PAD Kit, under an embodiment.

Figure 5 shows the adhesive membrane with the PAD Kit frame and blade assembly, under an embodiment.

Figure 6 shows the removal of skin pixels with the PAD Kit, under an embodiment.