



UNIVERSITÀ DEGLI STUDI DI BARI
DIPARTIMENTO DELL'EMERGENZE E DEI TRAPIANTI D'ORGANO (D.E.T.O.)
AZIENDA OSPEDALIERO-UNIVERSITARIA CONSORZIALE POLICLINICO DI BARI
U. O. C. CHIRURGIA PLASTICA E RICOSTRUTTIVA UNIVERSITARIA
E CENTRO GRANDI USTIONIATI



CATTEDRA E SCUOLA DI SPECIALIZZAZIONE IN
CHIRURGIA PLASTICA E RICOSTRUTTIVA

Direttore: Prof. Giuseppe GIUDICE

DIREZIONE: 080/5592344 REPARTO: 080/5592341-343

CASE REPORT: REGENERATIVE MEDICINE USING ADSCs IN BURN DISEASE

Extensive burns reconstruction continues to be a significant challenge for plastic surgeons because major burned patients require wide donor site areas.

Regenerative medicine using stem cells can be a new interesting solution for skin reconstruction in severe burns.

In this case we report the use of adult adipose-tissue derived stromal cells (ADSCs) in treating of a 38 year old female patient with deep thickness burns involving 60% of TBSA, using a patented device (MyStem™) for isolating adult viable mesenchymal stem cells from a stromal tissue.

The aim of this case is to show the efficiency of ADSCs in accelerating wound healing of deep thickness burns.

CASE STUDY AND METHODS

We report a case of 38 year old female patient with deep thickness burn of the 60% of TBSA, admitted in Burn Unit of the University of Bari in February 2016.

The patient presented deep partial thickness and full thickness burns involving both superior and inferior limbs as well as the anterior thorax and abdomen (image 1). To evaluate the efficacy of the ADSCs, two symmetric areas of full thickness burns on the abdomen were selected. The study area (right hemi-abdomen) was treated with ADSCs and Hyalomatrix. The control area (left hemiabdomen) was treated only with Hyalomatrix (Image 2). To obtain ADSCs, the lipoaspirate was harvested from abdominal subcutaneous tissue and processed by MyStem™ device. The stromal vascular fraction rich of ADSCs, has been equally distributed on a bilayer scaffold (10x20 cm) of hyaluronic acid. The non-woven pad used is composed of a wound contact layer made of a derivative of HA with an outer layer comprised of a semipermeable silicon membrane. The experimental algorithm involves the following assessment criteria: the taking capacity of the ADSCs and their ability to proliferate in vivo, that is the ability to form multiple colonies of epithelial cells tending to confluence, and the wound healing time. Wound healing was assessed at 5,10, 15 and 30 days after ADSCs application.



Image 1. 38 year old female patient with deep thickness burn involving 60% of TBSA



UNIVERSITÀ DEGLI STUDI DI BARI
DIPARTIMENTO DELL'EMERGENZE E DEI TRAPIANTI D'ORGANO (D.E.T.O.)
AZIENDA OSPEDALIERO-UNIVERSITARIA CONSORZIALE POLICLINICO DI BARI
U. O. C. CHIRURGIA PLASTICA E RICOSTRUTTIVA UNIVERSITARIA
E CENTRO GRANDI USTIONIATI
CATTEDRA E SCUOLA DI SPECIALIZZAZIONE IN
CHIRURGIA PLASTICA E RICOSTRUTTIVA
Direttore: Prof. Giuseppe GIUDICE
DIREZIONE: 080/5592344 REPARTO: 080/5592341-343

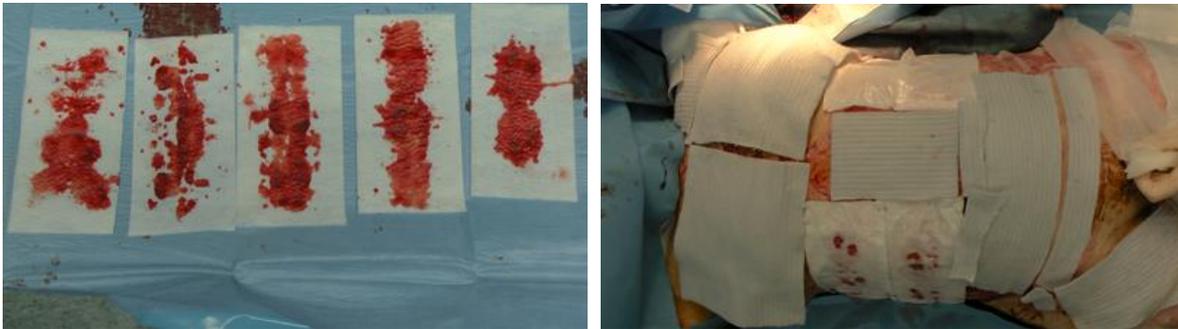


Image 2. A) Intraoperative view of LAF processed with MyStem™ device on scaffolds of Hyalomatrix. B) Intraoperative view after first debridment: right hemi-abdomen treated with ADSCs and Hyalomatrix; left hemi-abdomen treated with Hyalomatrix.

RESULTS

At the fifth day the bilayer device was completely adherent to the wound bed without signs of infections on both the study and the control area (Image 3). At the tenth day the outer layer, the silicone membrane of the scaffold, was removed to evaluate the taking of ADSCs. The right side showed small re-epithelized areas while the control area had a well vascularized wound bed (figure 4). At the fifteenth day an increase and confluence of the re-epithelized areas was observed (figure 5). Final evaluation was done after 30 days. The right area was almost completely healed while the left area presented a marginal re-epithelization and the wound bed was ready for grafting (figure 6).



Image 3. After 5 days the bilayer device was completely adherent to the wound bed without signs of infections on both right and left hemi-abdomen.



UNIVERSITÀ DEGLI STUDI DI BARI
DIPARTIMENTO DELL'EMERGENZE E DEI TRAPIANTI D'ORGANO (D.E.T.O.)
AZIENDA OSPEDALIERO-UNIVERSITARIA CONSORZIALE POLICLINICO DI BARI
U. O. C. CHIRURGIA PLASTICA E RICOSTRUTTIVA UNIVERSITARIA
E CENTRO GRANDI USTIONIATI



CATTEDRA E SCUOLA DI SPECIALIZZAZIONE IN
CHIRURGIA PLASTICA E RICOSTRUTTIVA

Direttore: Prof. Giuseppe GIUDICE

DIREZIONE: 080/5592344 REPARTO: 080/5592341-343



Image 4. At tenth day removing of silicone membrane. The right side (A) shows small re-epithelized areas while the control area (B) has a well vascularized wound bed.



Image 5. After 15 days we see the confluence of the re-epithelized areas.



UNIVERSITÀ DEGLI STUDI DI BARI
DIPARTIMENTO DELL'EMERGENZE E DEI TRAPIANTI D'ORGANO (D.E.T.O.)
AZIENDA OSPEDALIERO-UNIVERSITARIA CONSORZIALE POLICLINICO DI BARI
U. O. C. CHIRURGIA PLASTICA E RICOSTRUTTIVA UNIVERSITARIA
E CENTRO GRANDI USTIONIATI



CATTEDRA E SCUOLA DI SPECIALIZZAZIONE IN
CHIRURGIA PLASTICA E RICOSTRUTTIVA

Direttore: Prof. Giuseppe GIUDICE

DIREZIONE: 080/5592344 REPARTO: 080/5592341-343



Figure 6. After 30 days the right area (treated with MyStem™) is almost completely healed while the left area presents a marginal re-epithelization and it has been grafted.