OUR EXPERIENCE WITH AUTOLOGOUS STEM CELL APPLICATIONS IN CHRONIC NON HEALING ULCERS OF LOWER LIMB

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OUR INSTITUTION

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FOOT ULCERS

- Leg and foot ulcers are common
- Chronic non healing ulcers due to non specific causes of
  - arterial
  - venous
  - neurogenic
  - metabolic (Diabetic)
  are usually refractory to treatment, even with the best available treatment today, because of persistent etiological factors.
AIM & OBJECTIVE

- We present here our experience of autologous bone marrow derived stem cell therapy to chronic non-healing ulcers of varied etiology such as:
  - Diabetes
  - Sickle cell disease
  - Buerger’s disease (PVD)
  - Hansen’s disease
  - Burn injury with ulcer etc., which are refractory to conventional methods of management.
DIABETIC FOOT ULCERS

- A chronic systemic disease involving almost all systems.
- Leads to neuropathy, microangiopathy causing ulceration after minor trauma.
- Glucose laden tissue favours the spread of infection.
- Ulcer prone for delayed healing, non-healing, chronicity, gangrene, graft failure, recurrence & limb loss.
- In this study we avoid these complications by using cell therapy.
DIABETIC FOOT ULCER VIDEO 1
MATERIALS AND METHODS

- Clearance of institutional ethics committee was obtained.
- A thorough search of literature was done on related topics before the study.
- Informed consent of the patient was taken before the study.
BONE MARROW HARVEST

VIDEO 2
METHODS

- Bone marrow was harvested from patients’ sternum or iliac crest under aseptic conditions
- The harvested marrow was then centrifuged with buffered Ficol medium
- The mononuclear cell layer was pipetted out and injected to the ulcer base, floor, margin, edge and surrounding tissues of the ulcer site
- Healing of ulcer and appearance of granulation tissue were observed
Stem Cell

- A cell that has the ability to continuously divide and differentiate (develop) into various other kind(s) of cells/tissues
ADULT STEM CELLS
(MULTIPOTENT CELLS)

- They are postembryonic stem cells required for normal cellular turnover and repair.

- The best example is the hematopoietic stem cell but they are found in nearly every major organ.

- They are relatively undifferentiated cells that are able to maintain their own numbers for life through continuous division.

- Their progeny can differentiate into various cell lineages.

- They divide slowly and this reduces the rate at which stem cells acquire DNA mutations.
APPLICATION OF CELL THERAPY

VIDEO 3
CASE 1

DIABETIC FOOT ULCER
1 week after therapy

4 weeks after therapy
6 weeks after therapy
6 weeks after therapy
6 weeks after therapy
CASE 2

AT PRESENTATION
48 HRS AFTER CELL THERAPY
2 WEEKS AFTER THERAPY
6 WEEKS AFTER THERAPY
CASE 3
Non-healing ulcer with discharging pus
-Post amputation
WOUND AFTER DEBRIDEMENT
48 HOURS AFTER APPLICATION
Sickle cell disease (SCD) is an inherited blood disorder that causes bone marrow to produce RBCs with defective hemoglobin, HbS.

Leg ulcers are most common cutaneous manifestation of SCD. These ulcers are characterized by indolent, intractable course typically healing up to 16 times slower than venous ulcers. A patient who experiences sickle cell ulcers is likely to ulcerate again. Approximately 97% of healed sickle cell ulcers will recur in less than 1 year.

Due to recalcitrant nature of these ulcers patient may experience significant disfigurement, non-healing, graft failure, chronicity, malignant transformation, social isolation & loss of income.
CASE 1

ON PRESENTATION

The ulcer after 48 hours of cell therapy looked like this & measured 8.5 × 5 cms with pain substantially reduced.
AFTER DEBRIDEMENT
1 WEEK AFTER APPLICATION
2 WEEKS AFTER
6 WEEKS AFTER
CASE 2

BILATERAL SICKLE CELL LEG ULCER
AFTER DEBRIDEMENT
ERROR:

STACK UNDERFLOW

OFFENDING COMMAND:

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ERROR: stack underflow