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Autologous Bone Marrow Stem Cell Therapy for an Ischemic Ulcer of the Lower Limb in a Diabetic Patient

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Background:

Chronic limb ischemia is an outcome of peripheral arterial disease. If revascularization cannot be done, amputation is the only option left. Recent studies report that the injection of Bone marrow mononuclear cell concentrate with stem cells or Peripheral blood mononuclear cells rich in CD34+ cell content have resulted in angiogenesis, improved the functional activity of the ischemic limb and enhanced the healing of the ischemic ulcer. Here we report our experience with one such case.

Materials and methods:

A 68-year-old diabetic female patient with critical limb ischemia of the left lower limb with diffuse multiple critical stenosis of the only patent Tibial artery with a large ischemic ulcer with infection. The ulcer measured 30X12 cm at the posterior of the calf, exposing the Gastrocnemius and Achilles tendon and extending to the medial aspect of the foot measuring 14 X 10cm. A lateral extension of the wound was present as two places just above the ankle joint, each measuring 4.5 X 4.0 CM. The patient had been advised amputation of the lower limb elsewhere. She was administered Autologous Bone Marrow Stem Cell Therapy (ABMSCT) twice at an interval of one month. 110 ml of Bone marrow was aspirated each time under short general anesthesia, transported in Acid Dextrose Citrate and was processed for mononuclear cells (MNC) by ficoll density gradient centrifugation, as per cGMP Protocol. The MNC concentrate was injected at various sites in the Gastrocnemius muscle and the surrounding area after necessary wound debridement. First time the MNC concentration injected, contained 603 Million cells and the second time 786 Million cells. The patient was followed up regularly for all relevant parameters. Skin grafting was performed to the uncovered areas of the wound on the 57th day from the first stem cell injection. Angiography was done to adjudge the progress.

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Results:

The healthy granulation gradually started appearing in the areas which were initially unhealthy and ischemic. Skin started growing from the edges of the wound and fully covered the lateral two wounds and 23% of the area of the wound on the medial side of the foot. Approximately 15% of the wound surface of the posterior of the calf was covered with the in growing skin at the time of skin grafting.

Conclusion:

ABMSCT has been reported for treatment of CLI in many parts of the world, but not in such a large wound of the size that we have come across. As ABMSCT enhances the wound healing process in case of chronic ischemic wounds we recommend that it may be considered in cases similar to what we have experienced, before deciding on an amputation, to salvage the limb.