

REFRACTORY ANGINA (RA) TREATMENT BY PERCUTANEOUS RETROGRADE SINUS TECHNIQUE (PRST) TRANSPLANTATION OF UNSELECTED AUTOLOGOUS BONE MARROW MONONUCLEAR CELLS (ABMMC). LONG TERM FOLLOW-UP

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For the TELCECORI RA PERU Investigators (Terapia Celular Corazon Improves Refractory Angina).

Background

This study investigated whether PRST transplantation of ABMMC into the ischemic myocardium in patients with severe RA could safely reduce angina symptoms, improve myocardial perfusion, and increase left ventricular ejection fraction (LVEF).

Methods

A total of 26 patients were recruited from May 2005 to October 2006. Twelve were suitable for evaluation. Among evaluable patients median follow-up was 16 months (range: 7-20), median age was 68 years old (range: 42-81), male/female ratio was 10/2, all of them with RA and ischemic stress-induced myocardial segments assessed by gated single-photon emission computed tomography (SPECT). Median volume of 303 ml (range: 210-560) of bone marrow was obtained from iliac puncture under local anesthesia. Leuko-concentrated was performed using HES 6% and refrigerate centrifugation under sterile conditions. Concentrated cells were implanted retrogradely by coronariography of the venous sinus and in selected veins previous occlusion of the balloon "over wire" for 8 to 10 minutes. Median number of mononuclear and CD34+ cells infused were 7.88×10^8 and 1.206×10^7 respectively in a median volume of 45 ml (range 40-100). Angina symptoms, Canadian Cardiovascular Society class (CCS), myocardial perfusion at rest and stress LVEF by SPECT were assessed at baseline and last follow-up

Results

During and after the procedure no arrhythmias or increase in enzymes or hemodynamic changes were observed. After a median time of 21 days, the ABMMC transplantation led to significant relief of angina symptoms and improvement in functional class. One patient died because liver disease due a HVC chronic infection non-related to the procedure after 8 months. All but one evaluable patients improved CCS class by one ($t=5$, $p<0.000$) when compared at baseline and last follow-up. By SPECT we evaluated ischemic myocardium percentage, median baseline was 38.2% (range: 17.6-76.5) and at last follow-up this was reduced to 26.5% (range: 5.9-52.9) with statistical significant difference ($t=4.082$, $p=0.002$). Rest LVEF by SPECT did not show statistical improvement between baseline (median: 31.6%, range: 15.8-74) and last follow-up (median: 34.8%, range: 24.6-67, $t=2.041$, $p=0.066$); while stress LVEF does show statistical improvement between baseline (median: 31.8%, range: 15.5-67) and last follow-up (median 38.6%, range: 26-68, $t=4.596$, $p=0.001$). Median number of ischemic myocardium segments by SPECT were reduced from a baseline of 6.5 (range: 3-13) to 4.5 (range: 1-9) with statistical significant difference ($t=4.08$, $p=0.002$)

Conclusions

Unselected ABMMC transplantation by PRST is safe, and it allows to infuse a large volume of cells in poorly irrigated coronary vessels. This study suggests improvement and potential outcome durability of angina symptoms relief and better functional class, myocardial perfusion and contractility with this therapeutic approach in chronic coronary patients.

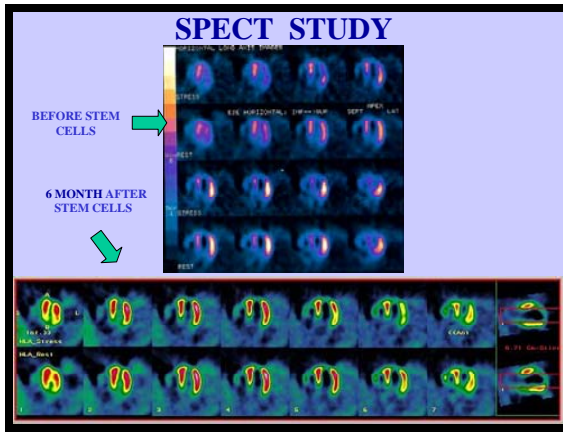


Figure 1A. Study of myocardial perfusion at baseline and at six month follow up of BMC that comparatively shows improvement of the perfusion in the lateral view.

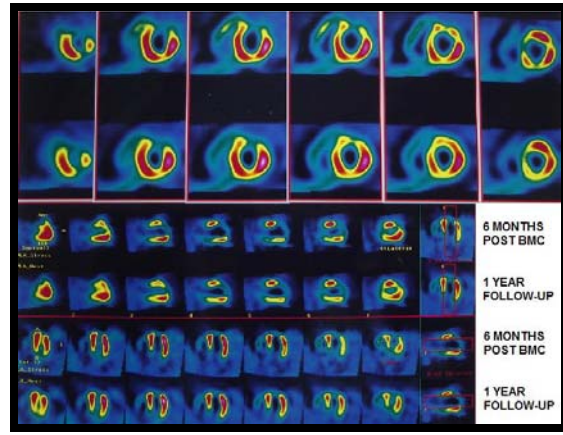


Figure 1B. Study of myocardial perfusion at six month and 1 year follow up of BMC that comparatively shows continues improvement of the perfusion in the lateral view.

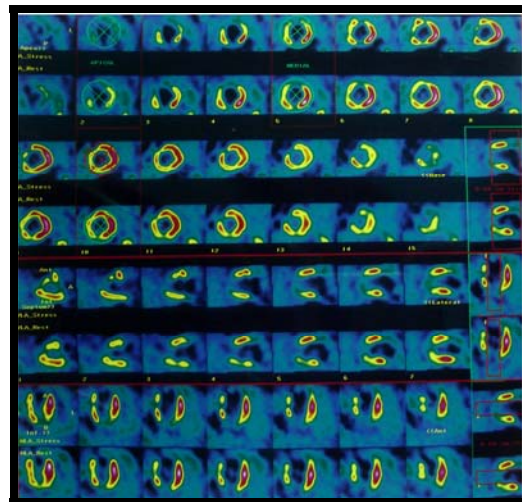
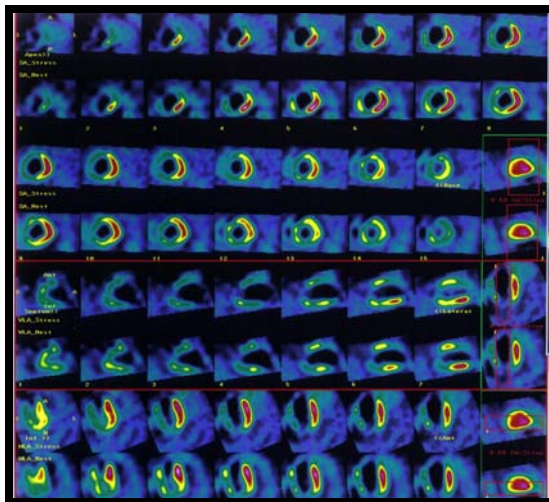


Figure 2A, 2B. SPECT of myocardial perfusion at baseline and at six month follow up of BMC transplantation that comparatively shows improvement of the perfusion in the septal and inferior views and an important increase of perfusion in the anterior view planes middle and basal

