Case Report

Labeled Stem Cells Transplantation to the Myocardium of a Patient with Chagas' Disease

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Stem cell transplantation is a new therapy applied to produce cardiac regeneration through differentiation or increase of heart myocytes or neovascular proliferation in patients in the end stage of congestive heart failure secondary to dilated cardiomyopathy[1], but the results are still unknown[2,3].

Case Report

A 50-year old male individual with refractory heart failure secondary to dilated cardiomyopathy due to Chagas' disease was referred to our Institute that is authorized by the Brazilian Health Ministry to employ stem cell therapy for dilated cardiomyopathy, Chagas' disease and acute myocardial infarction.

The myocardial perfusion study with 99 mTc SESTAMIBI showed large areas with low uptake in the anterior, apical and septal walls of the left ventricle (Fig. 1). Cardiac catheterization revealed severe left ventricular dysfunction (ejection fraction = 15.3%) and normal coronary arteries. Despite the optimization of medication, the clinical response remained poor. The patient was informed about the potential risks and benefits of the treatment with stem cell transplantation and signed the Term of Authorized Consent.

After the approval of the Research Ethics Committee, the patient underwent stem cell transplantation.

The patient received epidural anesthesia, and bone marrow cells were obtained by means of punctures in the iliac crest. Twenty milliliters of suspension of mononuclear cells were obtained employing the technique described in the literature[1]. Three milliliters of the suspension were labeled with 99mTc HMPAO. The mononuclear cell suspension was slowly injected (1 ml/minute) into the coronary arteries. Fifty per cent of the suspension was injected into the anterior descending artery, 25% into the left circumflex artery and 25% into the right coronary artery. The 99 mTc HMPAO-labeled cells were injected only into the anterior descending artery. New scintigraphic studies were performed 2 hours and 6 hours after the procedure, respectively.

Key words

Stem cell transplantation; Chagas' cardiomyopathy; Chagas' disease.

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Discussion

In patients for whom stem cell transplantation is indicated for the treatment of end stage dilated cardiomyopathy, if the coronary arteries are normal, the selective infusion of the mononuclear cell suspension into the anterior descending artery, the left circumflex artery and the right coronary artery will be our preferred technique. The infusion of the suspension is always made in the distal end of the proximal third of coronary arteries, after proof of absence of retrograde flow is obtained by making a previous injection of contrast medium through the infusion catheter.

There were doubts, however, whether the cells were retained by the cardiac muscle. This is the reason why the infusion of 99 mTc HMPAO-labeled mononuclear cells was performed using the intracoronary technique previously described.

Myocardial perfusion studies were repeated to analyze the same axes, 2 and 6 hours, respectively, after the transplantation of labeled mononuclear cells through the intracoronary route and revealed their uptake and retention in areas that had not uptaken SESTAMIBI before (Fig. 1). The whole-body scintigraphic image showed that the remaining

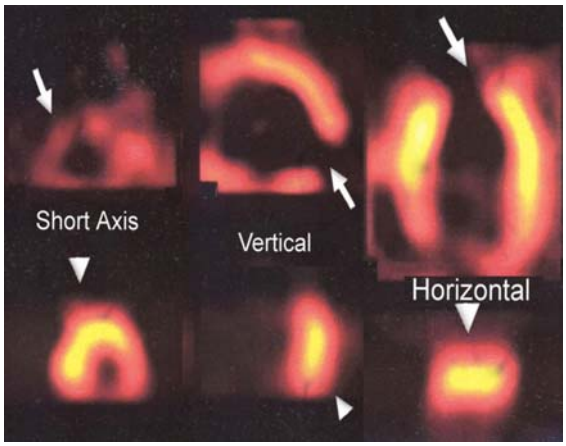

Fig. 1 - *The perfusion study with 99 mTc SESTAMIBI (short axis, horizontal and vertical) performed in the prior assessment of the patient to evaluate the indication of mononuclear cell transplantation is presented in the upper part of the figure and shows ample areas with no uptake in the anterior, apical and septal walls of the left ventricle (arrows). In the lower part of the figure, images obtained two hours after the infusion show uptake of 99 mTc HMPAO-labeled mononuclear cells in areas that previously had no uptake of SESTAMIBI (arrow heads).*

mononuclear cells were uptaken mainly by the liver and spleen (Fig. 2).

Conclusion

The case reported shows that after the infusion of mononuclear cells through the intracoronary technique, a significant amount of these cells is attracted to areas of the myocardium that had no uptake previously and is retained by these areas (probably in the fibrotic myocardium).

To our knowledge, this is the first report on these findings in Chagas'disease in the literature.

Potential Conflict of Interest

No potential conflict of interest relevant to this article was reported.

Sources of Funding

There were no external funding sources for this study.

Study Association

This study is not associated with any graduation program.

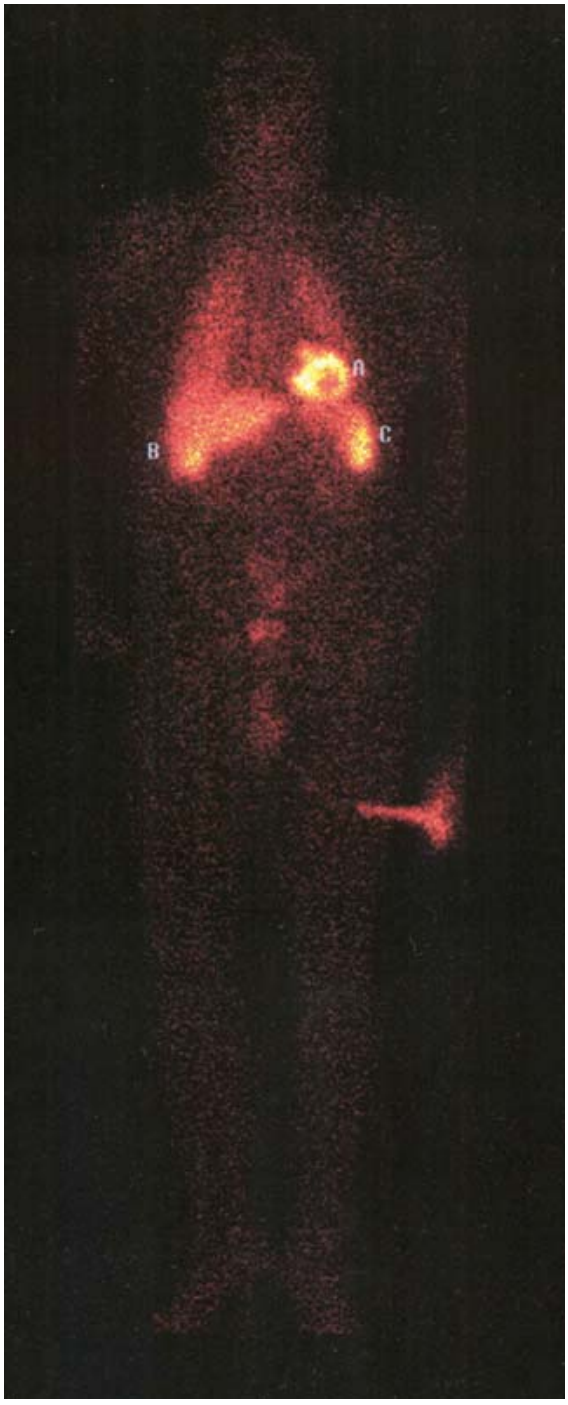

Fig. 2 - *The scintigraphic study (scan) performed two hours after the intracoronary infusion shows the distribution of 99 mTc HMPAO-labeled mononuclear cells. A high uptake is noticed in the cardiac muscle (a) and the remaining [cells] are uptaken primarily by the liver (b) and spleen (c). a - heart; b - liver; c - spleen.*

References

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