



## Coronary

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## Endovascular Cell Therapy Promising for Parkinson's Disease

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### Key Points:

- Catheter-based treatment safely delivers stem cells to Parkinson's disease patients
- Treatment leads to significant improvement in quality of life at 1 year
- Benefit correlates with magnetic resonance spectroscopy

By **Caitlin E. Cox**

Friday, January 16, 2009

NEW YORK—Endovascular treatment for Parkinson's disease with autologous bone marrow stem cells may offer significant long-term improvements in quality of life. The first clinical experience with this catheter-based approach was presented January 15, 2009, at the fifth annual Conference on Cell Therapy for Cardiovascular Disease.

"Parkinson's disease is associated with a progressive loss of nigrostriatal dopamine neurons," Jorge Tuma, MD, of CENCOR/Maison de Sante Clinic (Lima, Peru), explained during his presentation. "Medical therapy provides adequate control of symptoms for several years, but long-term treatment is complicated by progressive disability and the development of motor fluctuations and dyskinesias."

Dr. Tuma reported that in both human and animal models of Parkinson's disease, stem cells have been shown to "stimulate neurogenesis, provide extensive striatal reinnervation, and improve motor function." Prior research, however, has relied on surgical transplantation of stem cells.

### Better Quality of Life Holds Strong at 1 Year

The novel approach was documented by Dr. Tuma in 33 patients treated over the past 3 years. No major complications associated with the treatment have been observed. Initial improvements occurred at a median of 2 weeks post-treatment. By 1 year, some of those benefits had disappeared but even so, the median score remained significantly better than at baseline.

Improvements in quality of life were based on measures including the Schwab and England Activities of Daily Living ([figure 1](#)), motor skills examination ([figure 2](#)), and assessment of daily living activities ([figure 3](#)).

At 1 year, 21 patients (65%) had maintained early improvements in quality of life measures. Another 9 patients (27%) experienced initial gains but later regressed.

In addition, Dr. Tuma reported, magnetic resonance spectroscopy showed that mean putamenal uptake of N-acetyl aspartate/creatine significantly increased at 6 and 12 months in comparison with baseline ( $P < 0.001$ ). These changes correlated with clinical improvement.

"We await further investigation from larger, randomized studies," he concluded.

### STUDY DETAILS

The median age of the patients was 64.5 years, and the median duration of Parkinson's disease was 7 years. The majority (66.6%) were male.

To obtain stem cells, 450 mL of blood was collected from each patient's bone marrow with an aspiration needle under local anesthesia. The sample was then processed to create a CD43+ and mononuclear-enriched cell suspension. Within 2 hours, the preparation (median volume 80 cc, containing  $12.34 \times 10^6$  CD34+ cells and  $14 \times 10^8$  mononuclear cells) was transplanted via angiographically guided catheter into a carotid artery. The choice of either the right or left carotid artery was made based on the side with the most neurological impairment according to magnetic resonance imaging.

### Source:

Tuma J. Safety and efficacy of autologous bone marrow mononuclear transplantation in Parkinson's



disease: The first clinical experience by endovascular therapy. Presented at: Fifth International Conference on Cell Therapy for Cardiovascular Disease; January 15, 2009; New York, NY.

**Disclosures:**

- Dr. Tuma reports no relevant conflicts of interest.

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