

Stem cells help doctors restore woman's smile, regenerating bone to hold dental implants

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Durham, NC ([PRWEB](#)) November 05, 2014 -- Half of all traumatic injuries to the face result in a loss of teeth and the surrounding tissue and bone that once supported them, which in turn makes these types of injuries very debilitating and difficult to treat. But in a new study published in the latest issue of STEM CELLS Translational Medicine, doctors at the University of Michigan School of Dentistry (UMSoD), Ann Arbor, have found a new way to regenerate a patient's jawbone through the use of stem cells.

The procedure, done under local anesthesia, significantly speeds up the healing time relative to that of traditional bone grafting while allowing a patient to experience only a minimal amount of pain.

Part of a larger clinical trial, the findings highlighted in this issue focus on a 45-year-old woman missing seven front teeth plus 75 percent of the bone that once supported them, the result of a blow to her face five years earlier. She was left with severe functional and cosmetic deficiencies, since the missing bone made it impossible for her to have dental implant-based teeth replacements.

Darnell Kaigler, DDS, MS, PhD, an assistant professor of dentistry in the Department of Periodontics and Oral Medicine, was a lead member of the study team. "In small jawbone defects of the mouth created after teeth were extracted, we have placed gelatin sponges populated with stem cells into these areas to successfully grow bone."

Since the sponge material is soft, it does not work in larger areas. Thus, he and his team of researchers decided to try b-tricalcium phosphate (b-TCP) as a scaffold upon which to place the cells instead. "For treating larger jawbone defects, it is important to have a scaffold material that is rigid and more stable to support bone growth," he explained.

They then placed the b-TCP scaffold, which had been seeded with a mixed population of bone marrow-derived autologous stem and progenitor cells 30 minutes prior to treatment at room temperature, into the defective area of the patient's mouth during a procedure that requires only local anesthesia. Four months later, 80 percent of her missing jawbone had been regenerated, allowing them to proceed with placing oral implants that supported a dental prosthesis to once again give her a complete set of teeth.

Study team member Sharon Aronovich, DMD, FRCD(C), a clinical assistant professor of dentistry in the Department of Oral and Maxillofacial Surgery at the UMSoD, said, "I am very grateful to all the patients and researchers that participated in this study. Thanks to everyone's efforts, we are one step closer to providing patients with a minimally invasive option for implant-based tooth replacement."

"As the first report to describe a cell therapy for craniofacial trauma reconstruction, this research serves as the

foundation for expanded studies using this approach," said Anthony Atala, M.D., Editor-in-Chief of STEM CELLS Translational Medicine and director of the Wake Forest Institute for Regenerative Medicine.

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The article, "Optimized Cell Survival and Seeding Efficiency for Craniofacial Tissue Engineering Using Clinical Stem Cell Therapy," can be accessed at www.stemcellstm.com.

About STEM CELLS Translational Medicine: STEM CELLS TRANSLATIONAL MEDICINE (SCTM), published by AlphaMed Press, is a monthly peer-reviewed publication dedicated to significantly advancing the clinical utilization of stem cell molecular and cellular biology. By bridging stem cell research and clinical trials, SCTM will help move applications of these critical investigations closer to accepted best practices.

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