

Dental stem cell grows human bone

Latest research puts dentists at the forefront of life-saving stem cell therapy.

by Pam Johnson



Photo: Image Source/Getty Images

When clinical research moves from animal to successful human trials, there is a level of certainty that the treatment modality being studied has reached a level of maturity that puts it well on the road to being safe and beneficial for the end recipient—the human patient. There is also the assumption that the trial involves the medical, not the dental community.

But nine Italian researchers from the 2nd University of Naples, Italy changed all that when they reported their latest findings in the November 2009 *eCells & Materials Journal*. What they reported, and what other scientists around the world continue to work toward, one day will put dentistry in a leadership position to provide a life-saving service to their patients. It's long been recognized that stem cell therapy will be the future of medicine. Now dentists can play a role in giving their patients the biological insurance they need to perhaps save and/or prolong their children's and even their own lives in the future.

"This breakthrough clinical study uses the patients' own stem cells harvested from their own teeth to repair bone. It is the first of what we believe will be an expanding number of applications to treat a broad array of diseases, traumas, and injuries," said Art Greco, CEO of StemSave, a cryogenic dental stem cell bank headquartered in New York City.

The study reported by the Italian researchers involved seven patients who required extraction of their mandibular third molars. The patients presented with bilateral bone reabsorption of the alveolar ridge distal to the second molar

secondary to impaction of the third molar on the alveolar lamina, producing a defect without walls of at least 1.5 cm in height. The researchers extracted maxillary third molars for pulp stem cell extraction. The extracted cells were replicated in the laboratory, seeded onto a collagen sponge scaffold and placed into the injury site. After three months all the patients had vertical repair and complete restoration of periodontal tissue back to the second molars.

About StemSave

StemSave was established in 2007 by a collaboration of dentists and stem cell researchers in an effort to give dental patients a convenient and reliable way to benefit from emerging healthcare treatments. Dentists can obtain lifetime enrollment for \$90 by visiting the company's Web site www.stemsave.com and clicking on Dental Professional. Greco said they have the largest network of dentists in the country and are growing rapidly. StemSave provides enrolled dentists with a practice enhancement package offering education with CE credits, informational materials, patient brochures, posters, and marketing materials. Furthermore, dental practices receive a fee from StemSave for each viable stem cell recovery. One or more emergency kits for sending extracted teeth are also provided each dentist enrollee for the patient who walks in the door for an unscheduled extraction and wants to participate in the program. The tooth transport system contains a vial with fluid that induces hypothermia in the tooth to keep the pulp alive while enroute to the StemSave lab for

Not only is this clinical study a breakthrough in dental stem cell research, but it may also be a wake up call to dentists who have yet to sign on with the three or more dental stem cell banks providing this service for consumers. Unlike controversial embryonic stem cells, dental stem cells can be harvested successfully from the pulp chambers of youngsters' baby teeth as well as permanent or wisdom teeth from patients who are well into their 20s or early 30s. The only differences are in the numbers of cells that can be extracted based on age and their ability to replicate.

But teeth need to be professionally extracted rather than exfoliated in order to be candidates for stem cell harvesting, replication, and cryogenic preservation. Later, when needed, those stem cells then can be transformed into a host of different specialized cells such as heart, brain, nerve, cartilage, bone or liver cells to repair or build new body parts or treat disease or the damage caused by disease.

"What we are seeing now is a rapid advancement in the use of stem cells in therapeutic and clinical applications all over the world. Every major nation around the globe is spending billions of dollars in developing stem cell-based therapies," said Greco. One of the reasons Greco believes there is such urgency in the

research is the aging world population. Without new healthcare treatment modalities, these nations will go bankrupt trying to treat the elderly conventionally. New therapies are needed to prolong life and keep people healthy, not just mitigate their illnesses.

“But the best stem cells for use in stem cell therapy are your own,” said Gregory Chotkowski, StemSave’s President. “By doing so, the risks of non-biocompatibility and tissue rejection are negated.”

StemSave and other companies like it are putting dentistry in the forefront of helping to save and preserve life. Those at StemSave believe stem cell banking will become the standard of care in the next two to five years. “This is an exciting time for dental professionals to get involved with the emerging field of stem cells and regenerative therapies,” said Chotkowski. “The dental profession can take ownership in raising the awareness and educating their patients on the benefits of stem cell research. It embraces the entire dental profession including specialist, hygienist, assistants and staff. I feel that this is the true link between oral and systemic health.”