Promising new treatment could regenerate gum tissue and prevent tooth loss

25 March 2019

Gum disease is one of the most widespread diseases in the United Kingdom. When left untreated, the consequences can become irreversible. Now, a new procedure could treat the problem.

In an exciting new study, scientists have been able to combine biological and mechanical techniques to repair and regenerate bone and gum tissue.[1]

Long-standing gum disease often turns into periodontal disease, affecting the tissues supporting the teeth.

As the disease gets worse, the bone anchoring the teeth in the jaw wears away and tooth loss occurs.

To treat the condition, researchers surgically implanted a thin, film-like membrane between the inflamed gum and tooth. This membrane blocks the infection from the gums and delivers antibiotics, medication and growth factors to the gum tissue.

Dr Nigel Carter OBE, Chief Executive of the Oral Health Foundation, describes the impact of tooth loss and believes the research could be extremely promising.

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speaking more difficult. It can also have an impact on our confidence and mental well-being, as well as increase the risk of developing general health problems.

"Scientific breakthroughs in similar fields have already led to developments in many other areas of healthcare, such as prosthetics and tissue regeneration. These have helped millions of people gain a better quality of life and this cutting-edge research has the potential to do the same in the future. This study has significant potential and we shall look forward to human trials."

Most adults suffer from gum disease during their lifetime, and the majority will experience it more than once.

In recent years, gum disease has been linked with general health conditions such as diabetes, strokes, cardiovascular disease, poor pregnancy outcomes and even dementia.

As part of the study, researchers created a membrane which was coated with a special material that has been found to speed up bone regeneration. They then tested this against human stem cells from the gums which had been exposed to erosion for eight weeks.

Co-author of the study, Alireza Moshaverinia says: "We've determined that our membranes were able to slow down periodontal infection, promote bone and tissue regeneration.

"We've also figured out a way to prolong the drug delivery timeline, which is key for effective wound healing. We see this application expanding beyond periodontitis treatment to other areas needing expedited wound healing and prolonged drug delivery therapeutics."

The study was published last week in ACS Nano, a journal published by the American Chemical Society.

At present, there is no cure for periodontal disease, but it can be controlled with good home care and regular visits to the dentist. By doing these, any further loss of bone will be very slow, and it may stop altogether.

"All gum disease is caused by plaque – a film of bacteria which forms on the surface of the teeth," adds Dr Carter.

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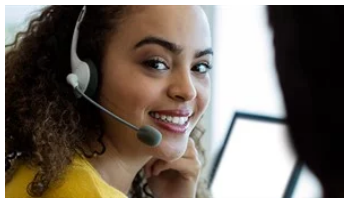

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day. This is done by brushing and cleaning in between the teeth with 'interdental' brushes or floss.

"The first sign of gum disease is blood on your toothbrush or in the toothpaste you spit out after cleaning your teeth. Your gums may also bleed when you are eating, leaving a bad taste in your mouth. Your breath may also become unpleasant."

To learn more about gum disease, take a look at our 'gum disease and oral health' page.

The charity also runs a Dental Helpline that offers free, impartial and confidential advice. The Dental Helpline can be contacted by telephone on 01788 539 780 or email at helpline@dentalhealth.org.

Sources

Mohammad Mahdi Hasani-Sadrabadi, Patricia Sarrion, Nako Nakatsuka, Thomas D. Young, Nika Taghdiri, Sahar Ansari, Tara Aghaloo, Song Li, Ali Khademhosseini, Paul S. Weiss, and Alireza Moshaverinia (2019) 'Hierarchically Patterned Polydopamine-Containing Membranes for Periodontal Tissue Engineering', ACS Nano Article ASAP, DOI: 10.1021/acsnano.8b09623

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