

New method for stronger dental implants

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Millions of people have bad teeth replaced with implants. Often following the procedure, they are unable to chew food for up to six months, until the implant has become fixated in the bone. Now, for the first time, a drug coating that has been tested on humans allows titanium screws to adhere to the bone better and faster. The Linköping researchers behind the method report that the results are good.

The study, led by Per Aspenberg, professor of orthopaedic surgery at Linköping University in Sweden, is published in the journal [Bone](#) and was highlighted in this week's edition of the *British Medical Journal* (*BMJ*).

The [implants](#) are screwed into the jawbone and provide purchase for artificial teeth. Using current technology, it may take four to six months before the bone surrounding the screw has healed and is strong enough so the patient can begin to benefit from surgery.

The coating, developed at Linköping University in Sweden, consists of a nanometre-thin layer of protein that attaches to the metal surface. Attached to the protein is a drug belonging to the bisphosphonates, usually used to treat osteoporosis. Several animal studies have shown that this method allows the bone surrounding the implant to rapidly become denser and stronger.

Now, for the first time, this method has been tested on humans. 16 patients each received two implants; one normal and a similar surface-treated implant as described above. Neither the patient nor the dental

surgeon knew which was which. After six months it was noted that for 15 of the 16 patients the treated screw was markedly much better established. Already after two months X-ray images showed positive changes adjacent to the treated screws. No complications occurred.

"It is the first time ever anyone has succeeded in reinforcing the bone around an implant with localised medication", says Per Aspenberg, professor of orthopaedics, who devised the method of using bisphosphonates in this way.

Pentti Tengvall, professor of biomaterials, developed the method of adhering the drug to the screw and the study was conducted by Jahan Abtahi, specialist MD and PhD, supported by Per Aspenberg. Addbio AB is a Linköping based company now working on commercializing the surface treatment for different types of implants in bone.

More information: A bisphosphonate-coating improves the fixation of metal implants in human bone. A randomized trial of dental implants by Jahan Abtahi, Pentti Tengvall and Per Aspenberg. *Bone* (in press), published online 10 February 2012.

Provided by Linköping University

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