

the amount of bone ingrowth into HA-coated implants, this being three-fold greater compared with completely unloaded implants. This positive effect of dynamic load was not evident for Ti implants. The best anchorage and greatest amount of bone ingrowth was obtained in the loaded stable situation when the implant was coated with HA.

An increased fibrous fixation was obtained with decreased range of motion (from 500 μm to 150 μm) by both HA and Ti implants, and a further increase in fixation was obtained when the observation period was extended from 4 weeks to 16 weeks. From these studies it could also be demonstrated that the fixation of fibrous anchored HA implants was obtained in 1/4 of the time required for the equal fixation of implants without HA-coating.

The consequence of immobilization of a motion-induced fibrous anchored implant was a complete replacement of the membrane by bone, irrespective of type of coating. A greater amount of bone ingrowth was obtained with immobilized HA-coated implants compared with immobilized Ti implants.

From the results presented here it can be concluded that HA-coating has a positive effect on bone-implant fixation in various situations, i.e. under stable unloaded conditions, under stable loaded conditions, and under unstable mechanical conditions. The most striking effect of HA was the capability to enhance bone to grow across a gap around the implant both during stable and unstable mechanical conditions, and even be capable of converting a motion-induced fibrous membrane to bony anchorage.

This supplement is based on the following studies, which will be referred to in the text by their Roman numerals (I–VIII).

- I. Søballe K, Hansen ES, B-Rasmussen H, Pedersen CM, Bünger C. Hydroxyapatite coating enhances fixation of porous coated implants. A comparison in dogs between press fit and non-interference fit. *Acta Orthop Scand* 61(4):299-306, 1990.
- II. Søballe K, Pedersen CM, Odgaard A, Juhl GI, Hansen ES, B-Rasmussen H, Hvid I, Bünger C. Physical bone changes in Carrageenin-induced arthritis evaluated by quantitative computed tomography. *Skeletal Radiology* 20:345-352; 1991.
- III. Søballe K, Hansen ES, B-Rasmussen H, Hjortdal VE, Juhl GI, Pedersen CM, Hvid I, Bünger C. Fixation of titanium- and hydroxyapatite coated implants in arthritic osteopenic bone. *J Arthroplasty* 6(4):307-316; 1991.
- IV. Søballe K, Hansen ES, B-Rasmussen H, Hjortdal VE, Juhl GI, Pedersen CM, Hvid I, Bünger C. Gap healing enhanced by hydroxyapatite coating in dogs. *Clin Orthop* 272:300-307; 1991.
- V. Søballe K, Hansen ES, B-Rasmussen H, Pedersen CM, Bünger C. Bone graft incorporation around titanium-alloy- and hydroxyapatite coated implants in dogs. *Clin Orthop*, 274:282- 293; 1992.
- VI. Søballe K, Hansen ES, B-Rasmussen H, Jørgensen PH, Bünger C. Tissue ingrowth into titanium- and hydroxyapatite coated implants during stable and unstable mechanical conditions. *J Orthop Res* 10:285-299, 1992.
- VII. Søballe K, B-Rasmussen H, Hansen ES, Bünger C. Hydroxyapatite coating modifies implant membrane formation. Controlled micromotion studied in dogs. *Acta Orthop Scand*, 63(2):128-140; 1992.
- VIII. Søballe K, Hansen ES, B-Rasmussen H, Bünger C. Hydroxyapatite coating converts fibrous tissue to bone around loaded implants. *J Bone Joint Surg*, 75(B):270-278; 1993.

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Correspondence

Kjeld Søballe, M.D.
Department of Orthopedics
Aarhus Kommunehospital
University Hospital of Aarhus
DK-8000 Aarhus C
Denmark
Tel +45-86-112400
Fax +45-86-182264