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Trace elements on the surface of titanium implants extracted from rat bone

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Abstract:

In order to make clear the relationship between the surface properties of a dental implant and biocompatibility, trace elements on the titanium surface of the implant extracted from a rat bone were examined. A cpTi bullet, as a prototype, of 1.1 mm diameter and 3.5 mm length had a flat surface on its cylindrical side. The flat area was sandblasted by glassy particle and cleaned by argon sputtering. The surfaces of the implants extracted from the femur of Wistar rats were cleaned ultrasonically and examined by X-ray photoelectron spectroscopy (XPS). The detected main elements were Ti, O, C, and N. Ti peaks arise from the base material and the others indicate presence of bio-molecules including proteins. Trace elements, such as P, Ca and Si, were also detected. However, the Ca/P ratios were very small compared to those of calcium phosphate compounds, such as calcium diphosphate. This fact indicates that calcium phosphate compounds, including hydroxyapatite, don't form on the titanium implant in rat bone.

Key words: [dental implant](#), [biocompatibility](#), [X-ray photoelectron spectroscopy](#), [calcium](#), [phosphorus](#), [bone formation](#)

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