PEEK dental implants: A Review of the Literature.

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Abstract

The insertion of dental implants containing titanium can be associated with various complications, e.g. hypersensitivity to titanium. The aim of this article is to evaluate whether there are existing studies reporting on PEEK (polyetheretherketone) as an alternative material for dental implants. A systematic literature search of PubMed until December 2010 yielded three articles reporting on dental implants made from PEEK. One article analyzed stress distribution in carbon fibre reinforced PEEK (CFR-PEEK) dental implants by the three-dimensional finite element method, demonstrating higher stress peaks due to a reduced stiffness compared to titanium. Two articles reported on investigations in mongrel dogs. The first article compared CFR-PEEK to titanium coated CFR-PEEK implants, which were inserted into the femurs and evaluated after 4 and 8 weeks. The titanium coated implants showed significantly higher bone-implant contact (BIC) rates. In a second study implants of pure PEEK were inserted into the mandibles beside implants made from titanium and zirconia and evaluated after 4 months, whereas PEEK presented the lowest BIC. The existing articles reporting on PEEK dental implants indicate, that PEEK could represent a viable alternative material for dental implants. But further experimental studies on the chemical modulation of PEEK seem to be necessary, mainly to increase the BIC ratio and to minimize the stress distribution to the periimplant bone.