PO4019

# Hydrophilicity variation of plasma oxidized dental implant and its control strategy

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Superhydrophilic surface was achieved by plasma oxidation on SLA surface in the paper, which is deemed to highly enhance osseointegration between an endosseous implant and bone. The fresh titanium oxide surface was achieved by plasma oxidation process in vacuum chamber. Such plasma oxidized surfaces showed crystal structure of anatase (101) orientation and possessed elemental compositions of TiO2, Ti2O3 and TiO. The interface characteristic and variation of chemical composition in depth were studied thoroughly by XPS. The result shows that chemical composition gradiently changes from top layer to Ti substrate, which is very important for the long term stability of the dental implant in vivo. However the super hydrophilic surface was unstable and contact angle of the surface will increase with time inevitably when implant was exposed in air, which needs further treatment to overcome the aging problem. In this paper, the implant surface was cleaned by argon plasma in vacuum chamber in order to recover superhydrophilicity quickly. The experimental results showed that the introduction of such plasma oxidized surfaces in combination with plasma cleaning process before implantation operation improves hydrophilicity of dental implant, which, in turn, indicates the potential for improved implant osseointegration in vivo.

**Keywords**
plasma oxidization
hydrophilicity
long term stability
plasma cleaning