

C-07

A study on the mechanical properties of TiN/DLC based functionally graded coatings

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In recent, various functional coatings on artificial tooth implants have been conducted to enhance the bonding strength between implants and bones. Despite of these efforts, some previous reports argued that an adhesion strength between titanium implant and the final coatings like hydroxyapatite(HA) is weaker than the strength between coating and bone. In order to increase the adhesion force between the final coating and implant surface, TiN/DLC based functionally graded coating, which has higher mechanical strength than the titanium implant, was applied as a middle layer between titanium implant and final coating. Particularly we finally coated a biocompatible hydroxyapatite film on the DLC layer and examined the mechanical properties. As a result, TiN/DLC based functionally graded coating showed the higher adhesion strength compared with hydroxyapatite single layer coating on the titanium implant.