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Surface treatment of a titanium implant using low temperature atmospheric pressure plasmas HYUN-YOUNG LEE, TIANYU TANG, Pusan National University, JUNG-WOO OK, Korea Basic Science Institute, DONG-HYUN KIM, HO-JUN LEE, HAE JUNE LEE, Pusan National University — During the last two decades, atmospheric pressure plasmas(APP) are widely used in diverse fields of biomedical applications, reduction of pollutants, and surface treatment of materials. Applications of APP to titanium surface of dental implants is steadily increasing as it renders surfaces wettability and modifies the oxide layer of titanium that hinders the interaction with cells and proteins. In this study, we have treated the titanium surfaces of screw-shaped implant samples using a plasma jet which is composed of a ceramic coaxial tube of dielectrics, a stainless steel inner electrode, and a coper tube outer electrode. The plasma ignition occurred with Ar gas flow between two coaxial metal electrodes and a sinusoidal bias voltage of 3 kV with a frequency of 20 kHz. Titanium materials used in this study are screw-shaped implants of which diameter and length are 5 mm and 13 mm, respectively. Samples were mounted at a distance of 5 mm below the plasma source, and the plasma treatment time was set to 3 min. The wettability of titanium surface was measured by the moving speed of water on its surface, which is enhanced by plasma treatment. The surface roughness was also measured by atomic force microscopy. The optimal condition for wettability change is discussed.

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