Study of biocharacteristic of the effect of different surface condition to pure titanium implant

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**Background:** The biological material is a multidisciplinary approach research field and is also a key technology among the national economic and social development, and has already become a hot topic of research at home and abroad. As a typical representative of the biological materials, dental implant materials have become the clinical and scientific research hotspot at present. Implant surface treatment methods plays a vital role in improving the success rate of implanting.

**Aim/Hypothesis:** In order to prove the advantages and wide spread value of micro arc oxidation, sandblasting and acid etching technology.

**Material and Methods:** The surface of pure titanium was treated by micro arc oxidation, sandblasting and etching surface, which were divided into four groups: pure micro arc oxidation, sand spray + micro arc oxidation, acid etching + micro arc oxidation, sand spray + etching + micro arc oxidation. The four groups of specimens were co cultured with ST2 cells in vitro, and their biocompatibility was analyzed. Four groups of surface treated implants were implanted into the rabbit femur. The specimens were taken out for 4 and 8 weeks later. The bone mass and bone measurement around the bone implant were calculated, and the bone union and the bone characteristics of the implant were evaluated.

**Results:** In vitro experiment: the cell protuberances were deeper in the micro arc oxidation layer under 2500 times of microscope, and the adhesion was more firm. ST2 cells were inoculated on the surface of different treatment samples. The number of cells increased gradually with time, and the value of OD (absorbance value) increased gradually, and the activity of ALP activity was significantly higher than that of other three groups. In vivo experiments: the sand implant + etching + micro arc oxidation group had the highest shear strength and the highest BIC value.

**Conclusions and Clinical Implications:** Compared with the simple micro arc oxidation group, sand spray + micro arc oxidation group, acid etching + micro arc oxidation group, the pure titanium surface treated with sand blasting + etching + micro arc oxidation has better bio-compatibility, bone binding speed and osteogenesis ability.