

Textured bearing surface in artificial joints to reduce macrophage activation

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Micro slurry-jet erosion has been proposed as a precision machining technique for the bearing surfaces of artificial joints in order to reduce the total amount of polyethylene wear and to enlarge the size of the wear debris. The micro slurry-jet erosion method is a wet blasting technique which uses alumina particles as the abrasive medium along with compressed air and water to create an ideal surface. Pin-on-disc wear tests with multidirectional sliding motion on the textured surface of a Co–Cr–Mo alloy counterface for polyethylene resulted in both a reduction of wear as well as enlargement of the polyethylene debris size. In this study, primary human peripheral blood mononuclear phagocytes were incubated with the debris, and it was elucidated that the wear debris generated on the textured surface regulated secretion of the proinflammatory cytokines IL-6 and TNF- α , indicating a reduction in the induced tissue reaction and joint loosening.

