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Investigation of time-dependent wear behavior of dental ceramics paired with enamel

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The excessive abrasion of occlusal surfaces in ceramic crowns limits the service life of restorations and their clinical results. However, little is known about the time-dependent wear behavior of dental ceramics when they paired with enamel. The aim of this *in vitro* study was to investigate the dynamic evolution of the wear behavior of two kinds of dental ceramics when they paired with enamel. Specimens (n=6) were prepared of lithium disilicate and feldspathic porcelain. Isolated cusps of extracted molars were used as antagonists. *In vitro* wear was conducted in the tribometer (10 N vertical load) with lubricant (artificial saliva) for 1.2×10^6 cycles. After 1.2×10^6 cycles, the entire wear process of both friction pairs revealed 3 wear stages (running-in, steady and severe wear stages). The worn surfaces showed traces of ploughing. For the friction pair of feldspathic porcelain: Running-in wear stage 0-6×10^4 cycles; steady wear stage 6×10^4-8×10^4 cycles; severe wear stage 8×10^4-1.2×10^5 cycles. The worn surfaces showed traces of intensive wear during the entire wear process. Comparing the two friction pairs, lithium disilicate showed more wear loss than feldspathic porcelain. In contrast, the enamel paired with lithium disilicate showed less volumetric loss. The results suggest that the wear performance of the two friction pairs indicates the apparent similarity of the tribological characteristics of the traditional mechanical system. Additionally, the evaluation of the wear behavior of dental ceramics should be based on these three wear stages.

Biography

Shaofeng Zhang has completed his PhD from The Fourth Military Medical University. He is the Director of Department of Prosthodontics, School of Stomatology, The Fourth Military Medical University. He has published more than 25 papers in reputed journals and has been serving as an Editorial Board Member of repute.

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