Influence of hex geometry and prosthetic table width on static and fatigue strength of dental implants

R. Steven Boggan, MS,a J. Todd Strong, MS,b Carl E. Misch, DDS, MDS,c and Martha Warren Bidez, PhD


Statement of problem. Component fracture and screw loosening are prevalent concerns of contemporary dental implants.

Purpose. This laboratory investigation examined the influence of design factors such as the platform diameter and the hex height on the mechanical strength and quality of fit of the implant-abutment interface.

Material and methods. Static and cyclic compressive bending tests were conducted on 4 and 5 mm diameter bone density–based implants. SEM evaluation of the implant-abutment interface was also conducted to assess quality of fit between the mating components.

Results. The 5 mm diameter implant was stronger in both static and fatigue conditions than the 4 mm diameter implants. A comparison of the results to published literature indicated that both implants were equal to or superior to alternative prosthetic connections in an identical testing configuration.

Conclusion. Test results demonstrated the validity of wide diameter implants to reduce the likelihood of component fracture in contemporary dental implant systems. (J Prosthet Dent 1999;82:436-40.)