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Abstract
The purpose of this work is to evaluate changes in temperature of one-piece titanium implant surface during the setting of acrylic resin temporary crowns and to correlate thermal changes to implant diameter. Thirty-three one-piece implants (ARRP, Alpha-Biotech) were divided into 3 groups according to diameter size (G1=3 mm, G2=3.3 mm, G3=3.6 mm). Implants were mounted on an acrylic glass apparatus. Thermocouples were positioned at the most coronal thread. Lower incisor temporary polycarbonate crowns were filled with 80 µL of self-curing acrylic resin and positioned immediately on the implant abutment. Thermal changes of the implant surface were recorded continuously for 10 min. Data were statistically analyzed using one-way analysis of variance. The mean initial temperature (C0) of groups G1, G2 and G3 was similar (24.79±0.78°C, 25.26±0.63°C, 24.97±1.08°C, respectively). The setting of the acrylic resin temporary crown resulted in a significant increase in the implant surface temperature of all groups. The mean thermal amplitude (AC) for groups G1, G2 and G3 were 6.79±1.02°C, 6.61±0.94°C, 6.65±1.28°C, respectively. The mean time to maximum temperature (Tmax) for groups G1, G2 and G3 were 353.38±42.91 sec, 324.69±41.46 sec and 317.98±37.91 sec respectively (P>0.05). Direct application of auto-polymerizing resin to the titanium abutment of one-piece implants significantly increased the cervical implant surface temperature. Implant diameter did not influence the temperature changes.