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Literature Abstract

In vivo fracture resistance of implant-supported all-ceramic restorations.

This study measured the fracture load of implant-supported ceramic abutments restored with glass-ceramic crowns. An Al_2O_3 abutment (CerAdapt) and a ZrO_2 abutment (Wohlwend Innovative) were used. The abutments (n = 10) were placed on external hexed endosseous dental implants. The abutments were identically shaped to receive incisor-shaped glass-ceramic crowns (IPS Empress). The crowns were cemented to the abutments with a dual-polymerizing resin luting agent. Loads were applied at a 30-degree angle using a computer-controlled universal testing device to determine the fracture load, which was recorded and analyzed with the unpaired *t* test (.05). Statistically significant differences were noted between both groups ($P = .001$) of abutments. The mean fracture loads were 280.1 N (SD 103.1) and 737.6 N (SD 245.0) for the Al_2O_3 and ZrO_2 abutments, respectively. Both groups exceeded the maximum incisal forces reported in the literature. In the ZrO_2 group, four crowns failed in the abutments without any notable damage of the abutment. Three abutments fractured before any crown destruction. Three gold screws failed before fracture of either the abutment or crown. In the Al_2O_3 group, all failures occurred in the abutment and there was no crown failure. No implant fracture was noted in either group. ZrO_2 abutments may be a better all-ceramic choice than Al_2O_3 abutments.

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