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ADDITIVE MANUFACTURING A NOVEL DENTAL IMPLANT ABUTMENT

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Dental implants are an important elective option for the replacement of a missing tooth or teeth. An abutment is an interface component between the implant and artificial tooth/teeth. A novel dental implant abutment has been developed and patented. 3D printing or additive manufacturing, with plastic and metal, were investigated as an alternative approach for production of this prototype abutment. Scanning, computer-aided design and 3D plastic and metal printing were employed with MED690 VeroDentPlus and Duraform 316L stainless steel, respectively to fabricate a novel dental abutment prototype. Prototypes were printed with a claimed accuracy of 16 microns (plastic) and 8 microns (metal). The prototypes were qualitatively assessed for functionality by implant threading and simulated fabrication of an artificial tooth in a laboratory setting. The plastic prototypes could not tolerate artificial tooth fabrication due to failure. Metal prototypes tolerated artificial tooth fabrication successfully. 3D metal printing appears to be an alternative approach to dental implant prototype fabrication providing a predictable, cost-effective and efficient avenue. Further investigation is warranted.

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