TECHNICAL REPORT

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Dentistry — Screw loosening test using cyclic torsional loading for implant body/implant abutment connection of endosseous dental implants

Medecine bucco-dentaire — Essai de dévissage d'une vis utilisant une charge de torsion cyclique pour le corps d'implant/pilier implantaire des implants dentaires endo-osseux

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Foreword

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The committee responsible for this document is ISO/TC 106, *Dentistry*, Subcommittee SC 8, *Dental implants*.

Introduction

Most endosseous dental implants currently marketed employ a dental implant body that is inserted within the jaw bone and to which other components may be joined when constructing a prosthetic superstructure. The connection between these components and the implant body should be sufficiently rigid to resist vertical masticatory loads, which have a significant torsional component. Endosseous dental implants may, therefore, incorporate features to restrict rotation at the connection. If this is insufficiently strong, then undesirable incidents, including screw loosening, distortion and fracture of the linked components will occur. A cyclic torsional screw loosening test for the connection between implant body and implant abutment would facilitate comparative evaluation.

Dentistry — Screw loosening test using cyclic torsional loading for implant body/implant abutment connection of endosseous dental implants

1 Scope

This Technical Report provides guidelines for a method to determine the extent of screw loosening of the metallic implant body/implant abutment joint of endosseous dental implants, such as two-part implants or multi-part implants under cyclic torsional loading. This test is most appropriate for evaluating new types of joints fixed using screw(s) and metallic connecting parts. This Technical Report provides a protocol for torsional cyclic torque on an implant body/implant abutment joint, but its intended use is for prefabricated implant bodies, implant abutments and, if appropriate, implant connecting parts that are made of metallic materials.

It is not applicable to ensure the *in vivo* performance of endosseous dental implants and is not derived from observations of clinical failures.

NOTE This Technical Report is not intended for use with temporary abutments.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 1942, *Dentistry –Vocabulary*

ISO 16443, *Dentistry – Vocabulary for dental implants systems and related procedure*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 1942 and ISO 16443 and the following apply.

3.1
cyclic torque
repeated torsional force alternatively clockwise and counter clockwise

3.2
screw loosening
decrease in screw removal torque relative to the removal torque when the abutment screw was first installed

3.3
screw tightening torque
torque value for screw required to tighten the implant abutment, and the implant connecting part if appropriate, to the implant body as per specified by the manufacturer

3.4
screw removal torque
torque value for screw required to deconstruct the connection between the implant body and the implant abutment, and the implant connecting part if appropriate