Primary Stability Following Abutment Preparation of One-Piece Dental Implants.

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Purpose
One-piece dental implants are commonly used for the immediate restoration of missing teeth. In most cases, the clinician has to prepare the abutment introrally to ensure a proper emergence profile and abutment angulation. However, this procedure might impair primary stability and thus potentially compromise osseointegration. The aim of this study was to determine the effect of abutment preparation on the primary stability of a one-piece implant system (UNO MIS).

Materials and methods
Implant stability was assessed by resonance frequency analysis with a novel custom-made external fixation device, validated previously, developed specifically for resonance frequency measurements of this implant. Thirty 3 × 13-mm implants were inserted in porcine jawbone with insertion torque of 15 Ncm (group A, 15 implants) or 30 Ncm (group B, 15 implants). Abutments were prepared by reducing the facial aspect of the implant abutment with a high-speed dental turbine (400,000 rpm) equipped with a medium-roughness diamond bur. Implant stability quotients (ISQs) were measured before and after abutment preparation.

Results
Mean ISQs measured in group A and group B before abutment preparation were very similar (58.2 ± 1.4 and 57.4 ± 0.9, respectively; P > .05). Following abutment preparation, three implants in group A lost primary stability. The mean ISQ value in group A was reduced from 58.2 ± 1.4 to 54.9 ± 7.9 following abutment preparation (P < .05). The mean ISQ in group B was not affected by abutment preparation (57.4 ± 0.9 versus 57.3 ± 1.0; P > .05).

Conclusion
Abutment preparation of a one-piece dental implant inserted with low insertion torque might impair implant primary stability.