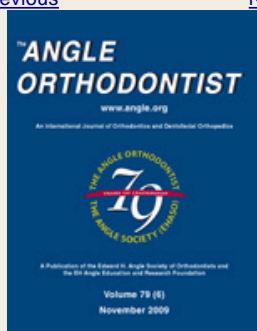


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Original Article

## Pitch and Longitudinal Fluting Effects on the Primary Stability of Miniscrew Implants

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### Abstract

**Objective:** To test the hypotheses that pitch and fluting have no effect on the primary stability of miniscrew implants (MSIs).

**Materials and Methods:** Maximum placement torque and pullout strength of experimental MSIs were compared with those of control MSIs with the use of synthetic and cadaver bone. MSIs with 1.00 mm pitch were compared with those with 1.25 mm and 0.75 mm pitch; MSIs with three longitudinal flutes were compared with the same MSIs without flutes. A total of 60 MSIs (15 of each design) were evaluated with synthetic bone; a split-mouth cadaver model was used to compare the three experimental designs against the 1 mm control MSIs (total of 90 MSIs).

**Results:** The synthetic bone model showed higher placement torque and pullout strength for the 0.75 pitch than for the 1.0 mm and 1.25 mm pitch MSIs, but differences were significant ( $P < .05$ ) only for pullout strength. The cadaver model showed no significant differences in placement torque or pullout strength associated with pitch. Both synthetic and cadaver bone models showed that MSIs with flutes had significantly ( $P < .05$ ) higher placement torque and pullout strength. Spearman correlations between placement torque and pullout strength were statistically significant for both synthetic ( $r = .504$ ) and cadaver ( $r = .502$ ) bone.

**Conclusion:** Within limits, decreasing MSI pitch increases pullout strength, and fluting increases both placement torque and pullout strength.

**Keywords:** [Miniscrew implants](#), [Pitch](#), [Fluting](#), [Pullout strength](#), [Insertion torque](#)

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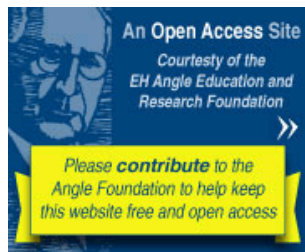
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