

In vitro study of heat production during power reduction of equine mandibular teeth.

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OBJECTIVE: To measure the amount of heat generated during 3 methods of equine dental reduction with power instruments. **DESIGN:** In vitro study. **SAMPLE POPULATION:** 30 premolar and molar teeth removed from mandibles of 8 equine heads collected at an abattoir. **PROCEDURE:** 38-gauge copper-constantan thermocouples were inserted into the lingual side of each tooth 15 mm (proximal) and 25 mm (distal) from the occlusal surface, at a depth of 5 mm, which placed the tip close to the pulp chamber. Group-NC1 (n = 10) teeth were ground for 1 minute without coolant, group-NC2 (10) teeth were ground for 2 minutes without coolant, and group-C2 (10) teeth were ground for 2 minutes with water for coolant. **RESULTS:** Mean temperature increase was 1.2 degrees C at the distal thermocouple and 6.6 degrees C at the proximal thermocouple for group-NC1 teeth, 4.1 degrees C at the distal thermocouple and 24.3 degrees C at the proximal thermocouple for group-NC2 teeth, and 0.8 degrees C at the distal thermocouple and -0.1 degrees C at the proximal thermocouple for group-C2 teeth. **CONCLUSIONS AND CLINICAL RELEVANCE:** In general, an increase of 5 degrees C in human teeth is considered the maximum increase before there is permanent damage to tooth pulp. In group-NC2 teeth, temperature increased above this limit by several degrees, whereas in group-C2 teeth, there was little or no temperature increase. Our results suggest that major reduction of equine teeth by use of power instruments causes thermal changes that may cause irreversible pulp damage unless water cooling is used.

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