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Application of infrared thermography to the pulp vitality test

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The purpose of this study was to search non-invasive and reproductive pulp test. Temperature of the crown surface was measured using the infrared thermography, and the pulp test was investigated with difference of crown temperature of the vital and the non-vital tooth *in vitro* and *in vivo*.

Exp.1 Twenty extracted human maxillary central incisors were used in this study. Two sample teeth after access cavity preparation were arranged setting with one pair. Then, the each tooth was estimated as the vital and the non-vital tooth. The physiological saline solution (37 DEGC) flowed into the chamber of only the supposition vital tooth with 0.8 ml/sec. While the saline solution flowing, crown surfaces were cooled with the water until temperature of surface becoming fixed. After cooling, temperatures of both crown surfaces were measured with the thermography at 10 second interval. Exp.2 In 10 patients who have the vital and non-vital teeth in the maxillary central incisors. Change of temperature of the surfaces after the cooling were measured with the thermography at 10 second interval. Data in Exp.1 and 2 were compared using Students t-tests.

Exp.1 It could recognize large difference in the temperature of crown surface between the supposition vital and non-vital teeth from immediately after the cooling load removing. The temperature of pulp chamber has participated in the temperature of surface. Exp.2 Difference of the temperature of surface was largest after the load removal 60 second later. Measurement of the crown surface temperature with appropriate load is effective to the inspection of the pulp vitality.

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