



[TOP](#) > [Available Issues](#) > [Table of Contents](#) > [Abstract](#)

ONLINE ISSN : 1880-3997

PRINT ISSN : 0917-2394

Pediatric Dental Journal

Vol. 17 (2007) , No. 2 pp.148-155

[\[PDF \(577K\)\]](#) [\[References\]](#)

Measurement of bone conduction characteristics for transmitted vibration sounds of tooth drilling

Masao Ozaki¹⁾, Atsuko Baba¹⁾, Kaori Ishii¹⁾, Hideyuki Takagi²⁾ and Wataru Motokawa¹⁾

1) Department of Oral Growth and Development, Division of Pediatric Dentistry, Fukuoka Dental College

2) Faculty of Design, Kyushu University

(Received on April 11, 2007)

(Accepted on August 23, 2007)

Abstract **PURPOSE:** In this study, we measured the vibration caused during dental treatment by an air turbine handpiece and a micro motor handpiece. We then analyzed the obtained data to develop a method for noise cancellation of such vibration during the treatment of tooth decay. We herein describe the audio characteristics of bone conduction sound made by teeth during dental treatment. We measure vibration sounds of an air turbine handpiece and a micro motor handpiece transmitted from teeth to the middle and/or inner ear and obtain its bone conduction characteristics for reducing uncomfortable dental treatment sounds using active noise control technique in the future. **METHODS:** First, we measure the frequency characteristics of both acoustic sounds and vibration sounds of two dental handpieces in a special treatment room. Second, we measure the frequency characteristics of bone conduction from teeth to the middle and/or inter ear by actuating a tooth with pure tones of several frequencies in an anechoic chamber. **RESULTS:** The basic rotational frequency of an air turbine head tip with no-load was about 5,500 Hz. A decline of the rotational frequency was confirmed at the turbine head when the bar came in contact with the tooth, and it was proven that the tooth received the effect of the vibration, when the head made contact with the tooth. The results showed that the micro motor handpiece speed varied from a low of 140 to 210 Hz to a medium speed of 280 Hz and a high speed of 700 to 770 Hz. These results were higher than manufacturer's specifications of micro motor handpiece. The results of the bone conduction amplitude-frequency characteristics were the best audible amplitude-frequency was near 2,000 Hz in the upper and lower left central incisors.

Key words Air turbine handpiece, Audition characteristic, Bone conduction, Frequency characteristics, Micro motor handpiece

[\[PDF \(577K\)\]](#) [\[References\]](#)

Download Meta of Article [\[Help\]](#)

[RIS](#)

[BibTeX](#)

To cite this article:

Masao Ozaki, Atsuko Baba, Kaori Ishii, Hideyuki Takagi and Wataru Motokawa:
Measurement of bone conduction characteristics for transmitted vibration sounds of tooth
drilling . *Ped Dent J* **17**: 148-155, 2007 .

JOI JST.JSTAGE/pdj/17.148

Copyright (c) 2007 by The Japanese Society of Pediatric Dentistry



[Japan Science and Technology Information Aggregator, Electronic](#)

