

A Morphometric Study of the Root Concavity on the Extracted First Premolar in a Group of the Thai Population

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Abstract

Objectives: The objective of this research was to determine the average concavity depth and width of first premolars in a group of Thais compared to the size of instruments used in periodontal therapy.

Methods: Among 260 extracted first premolars, 130 were maxillary and the other 130 mandibular. The width and depth of root concavities were measured at the coronal third and middle third with a surface-roughness tester. The width of the periodontal instruments was measured with Vernier calipers.

Results: Means and standard deviations of the concavity depth of the maxillary first premolar at the coronal third of mesial aspects, middle third of mesial aspects, coronal third of distal aspects, and middle third of distal aspects were 0.765±0.221 mm, 0.711±0.278 mm, 0.314±0.223 mm, and 0.504±0.250 mm, respectively. For the mandibular first premolar at the coronal third of mesial aspects, middle third of mesial aspects, coronal third of distal aspects, and middle third of distal aspects, values were 0.165±0.169 mm, 0.201±0.186 mm, 0.125±0.141 mm, and 0.139±0.132 mm, respectively. Means and standard deviations of the concavity width of the maxillary first premolar at the mesial and distal aspects were 0.836±0.607 mm and 1.874±0.976 mm, respectively, while for the mandibular first premolar at the mesial and distal aspects, values were 1.848±0.392 mm and 2.136±0.545 mm, respectively. The working-end widths of the instruments were 0.418–0.840 mm, and 18.46% of the mesial aspects of maxillary premolars were narrower than the smallest width of the instrument.

Conclusions: Based on this study, information on root concavities in first premolars in the Thai population will assist in better evaluation and treatment planning concerning the limited accessibility of instrumentation for use in root concavities, which can affect periodontal treatment outcomes.

Keywords: first premolar, root concavity, Thai

Introduction

Periodontitis is an infectious disease and chronic inflammatory condition affecting the periodontium caused by bacterial plaque. There are local factors involved in periodontitis, such as calculus, crowding of teeth, and cervical caries, and anatomic factors that appear differently in each person, such as cervical enamel projection, enamel pearl, or palatogingival groove. This includes the morphology of teeth, which varies from person to

person. Different types of tooth morphology have different responses to treatment. Some types of tooth morphology increase the chances of more bacteria deposits,⁽¹⁾ so being able to identify the type of tooth morphology can enhance diagnosis and periodontitis therapy.⁽²⁾

Although there has been a study on root morphology of the first premolar⁽³⁾ in a group of Thais, the incidence of root concavity in the first premolar is still unknown. From a study on a group of Indians by Joseph *et al.*,⁽²⁾