



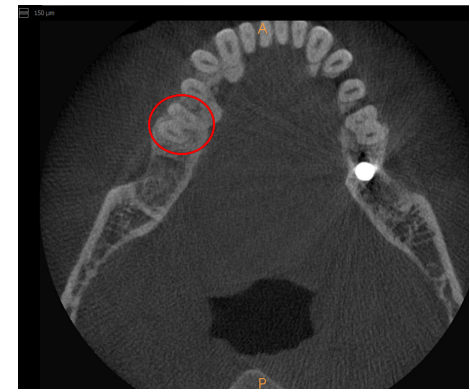
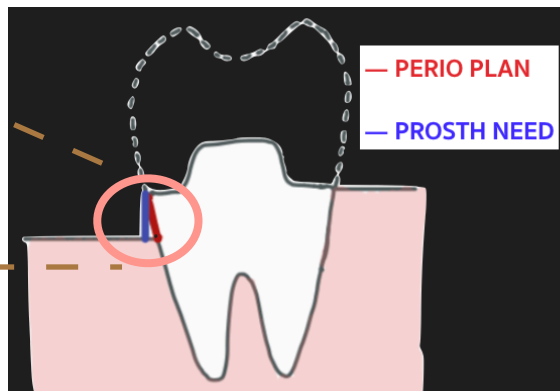
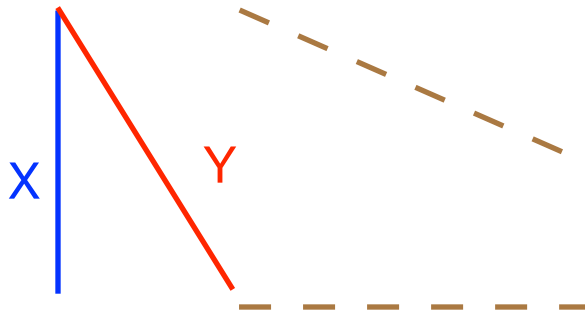
# Comparison of root trunk length in vertical dimension and along root surface in group of Thai population by CBCT

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X = Vertical Dimension

Y = Root Trunk Length along Root Surface



## Objective

- To compare between vertical dimension and length of root trunk in molar tooth.
- To determine what is the vertical dimension of molar tooth.
- To determine what is the length of root trunk of molar tooth.

## Background

Osseous resective surgery is the significant procedures in periodontal surgery and clinician must concern about biological width; the space occupied by junctional epithelium and connective tissue attachment because violation of biological width resulted in gingival inflammation, alveolar bone loss and pocket formation. In multiple root tooth, the other anatomy that affect the result of crown lengthening procedure is the position of furcation entrance. The average distance from margin of the crown or cavity to furcation entrance were 2.38 mm, which prone to violate the biological width. This condition may initiate bone loss in furcation area, lead to worsen tooth prognosis. To prevent this problem, surgeon must have the knowledge of each tooth root trunk length before surgical operation.

## Materials & Methods

### Materials

- CBCT image
- SPSS Program
- CS 3D Suit 3.7.10 Program

### Methods

Using CS 3D Suit 3.7.10 program interpreted DICOM file to determine between vertical dimension and length of root trunk in molar by adjusting coronal and sagittal plane, drawing the line included furcation entrance line, long axis line, line that parallel to long axis line and line along the root trunk length which started from CEJ to the furcation entrance to obtain both vertical dimension and length of root trunk.

## Data Analysis

The calibration between intra-examiner will be provided before CBCT interpret. Interclass Correlation Coefficient (ICC) should be nearly 1.0, it represented to the less interaction effect. Method for choosing test of normality are Kolmogorov-Smirnov and Shapiro-Wilk. Paired T-test and Willcoxon signed-rank test will be used to analyze the differences between vertical dimension and length of root trunk in molar tooth.

## Result

Tooth	N	Root trunk length		Vertical dimension		Statistic Difference
		Mean	SD	Mean	SD	
LFB	38	4.14	1.23	3.94	1.35	.000 <sup>a</sup>
LFL	48	4.78	0.97	4.38	0.96	.000 <sup>a</sup>
LSB	50	5.77	1.64	5.47	1.70	.000 <sup>a</sup>
LSL	59	5.76	1.11	5.41	1.17	.000 <sup>a</sup>
UFB	79	4.84	1.35	4.71	1.37	.000 <sup>b</sup>
UFD	85	5.35	1.35	5.05	1.42	.000 <sup>a</sup>
UFM	74	6.00	1.27	5.85	1.27	.000 <sup>a</sup>
USB	60	4.59	1.32	4.23	1.35	.000 <sup>a</sup>
USD	97	5.49	1.54	5.22	1.55	.000 <sup>a</sup>
USM	82	6.51	1.39	6.36	1.47	.000 <sup>a</sup>

a statistically different ( $\alpha=0.05$ , paired t-test)

b statistically different ( $\alpha=0.05$ , Willcoxon signed-rank test)

10 aspects	Tooth aspect
UFM	Mesial aspect of upper first molar
UFD	Distal aspect of upper first molar
UFB	Buccal aspect of upper first molar
USM	Mesial aspect of upper second molar
USD	Distal aspect of upper second molar
USB	Buccal aspect of upper second molar
LFB	Buccal aspect of lower first molar
LFL	Lingual aspect of lower first molar
LSB	Buccal aspect of lower second molar
LSL	Lingual aspect of lower second molar

## Conclusion

Root trunk length and vertical dimension are significantly different in each tooth. This difference may lead to less than expected tooth heights up to 1 mm. after crown lengthening process. This study contributes to surgical planning, periodontist uses the root trunk length for the reference to do the surgical crown lengthening while prosthodontist prefers to use the vertical dimension for restorative planning. Thus, even 1 mm. difference could be altered the prognosis of that tooth which can be change the restorative treatment planning.

**Keywords** : molar tooth, osseous surgery planning, root trunk, vertical dimension

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