

Labial Alveolar Bone Thickness and Its Correlation with Buccolingual Maxillary Incisors Angulation: A CBCT Based Study

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INTRODUCTION

The lateral cephalometric radiograph is the standard method for determining incisor inclination. (Do et al., 2019)

Cone-beam computed tomography (CBCT) images provide a 3D evaluation of the bones. (Wei et al., 2020)

The thinnest facial cortical plate found in the maxillary anterior teeth. (Araújo & Lindhe, 2005 and Araújo et al., 2015, Tomasi et al., 2010, Ten Heggeler et al., 2011)

The bone loss after a tooth extraction is unavoidable. (Araújo & Lindhe, 2005 and Araújo et al., 2015, Rodd et al., 2007)

The thickness of the labial alveolar bone must be at least 2 mm to achieve the best esthetic result. (Grunder et al., 2005 and Lee et al., 2019)

The buccolingual teeth angulation affects the treatment plans including implant placement. (Wang et al., 2014 and Kim et al., 2011)

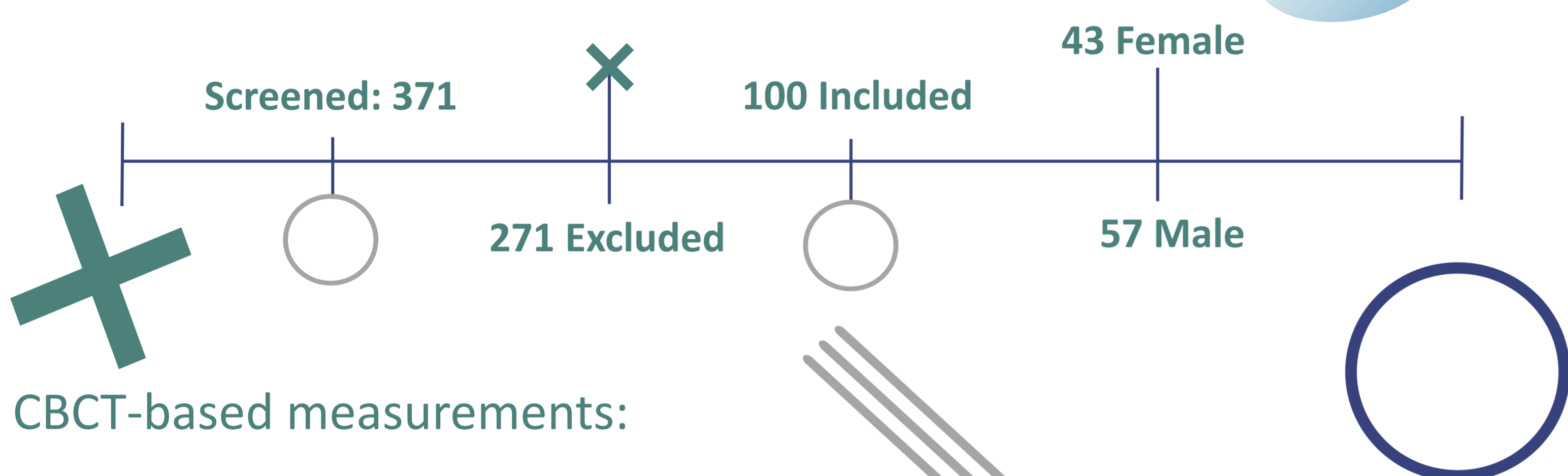
Understanding the labial alveolar bone thickness (ABT) and buccolingual teeth angulation may reduce the complications during implant placement.

OBJECTIVES

- To establish a standard measurement method for the CBCT.
- Measuring the teeth angulation and labial alveolar bone thickness in predetermined standard.
- Find any correlation between the labial alveolar bone thickness and buccolingual upper incisor teeth angulation.
- Find any gender variations.

METHODOLOGY

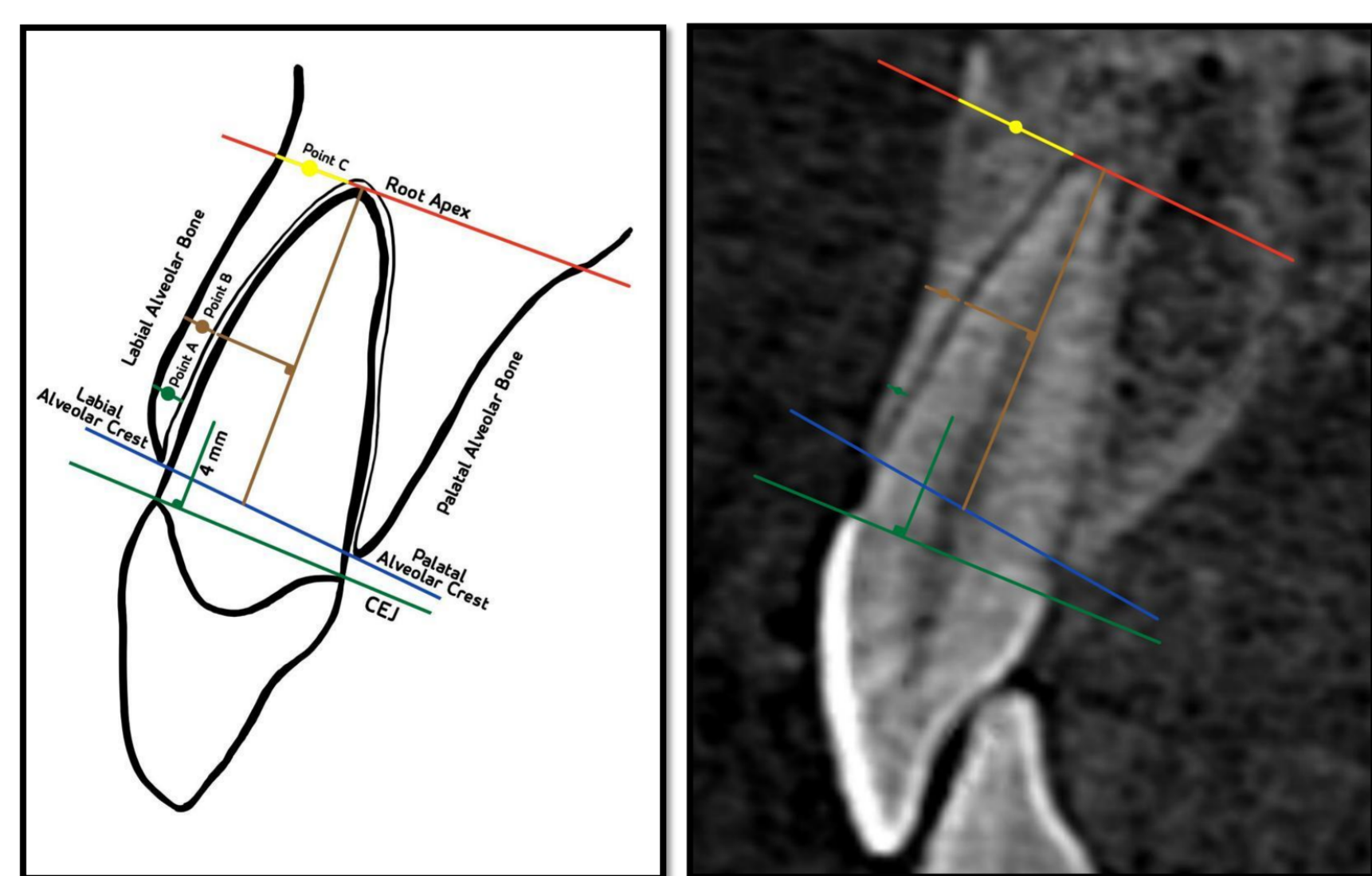
Sample screening:



CBCT-based measurements:

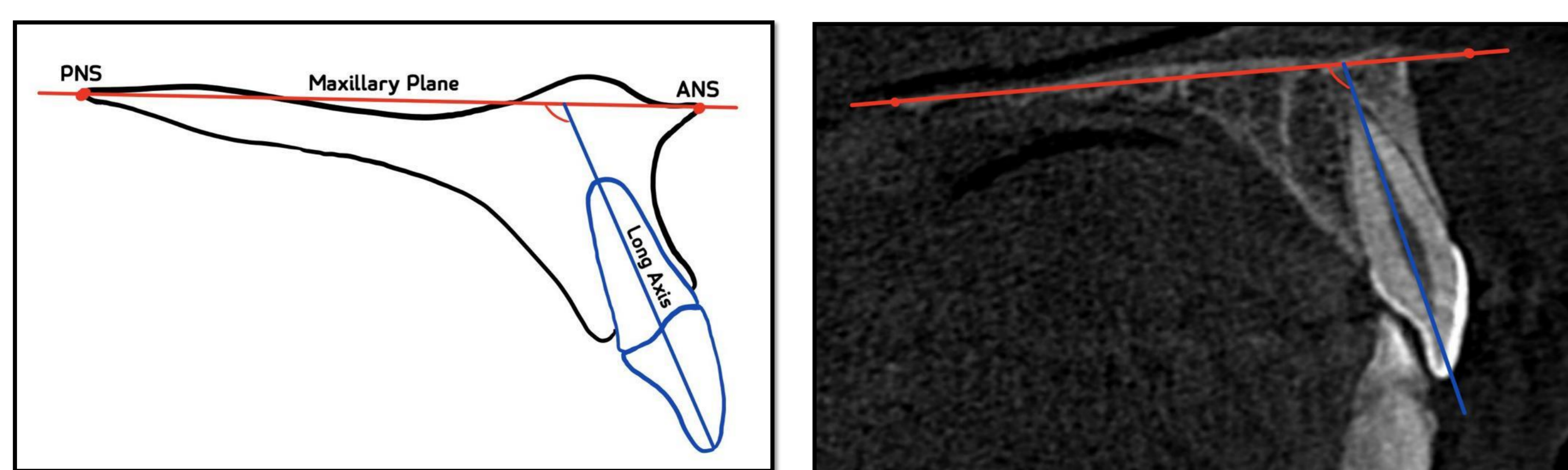
The labial alveolar bone thickness evaluated in three points:

- Point (A)
- Point (B)
- Point (C)



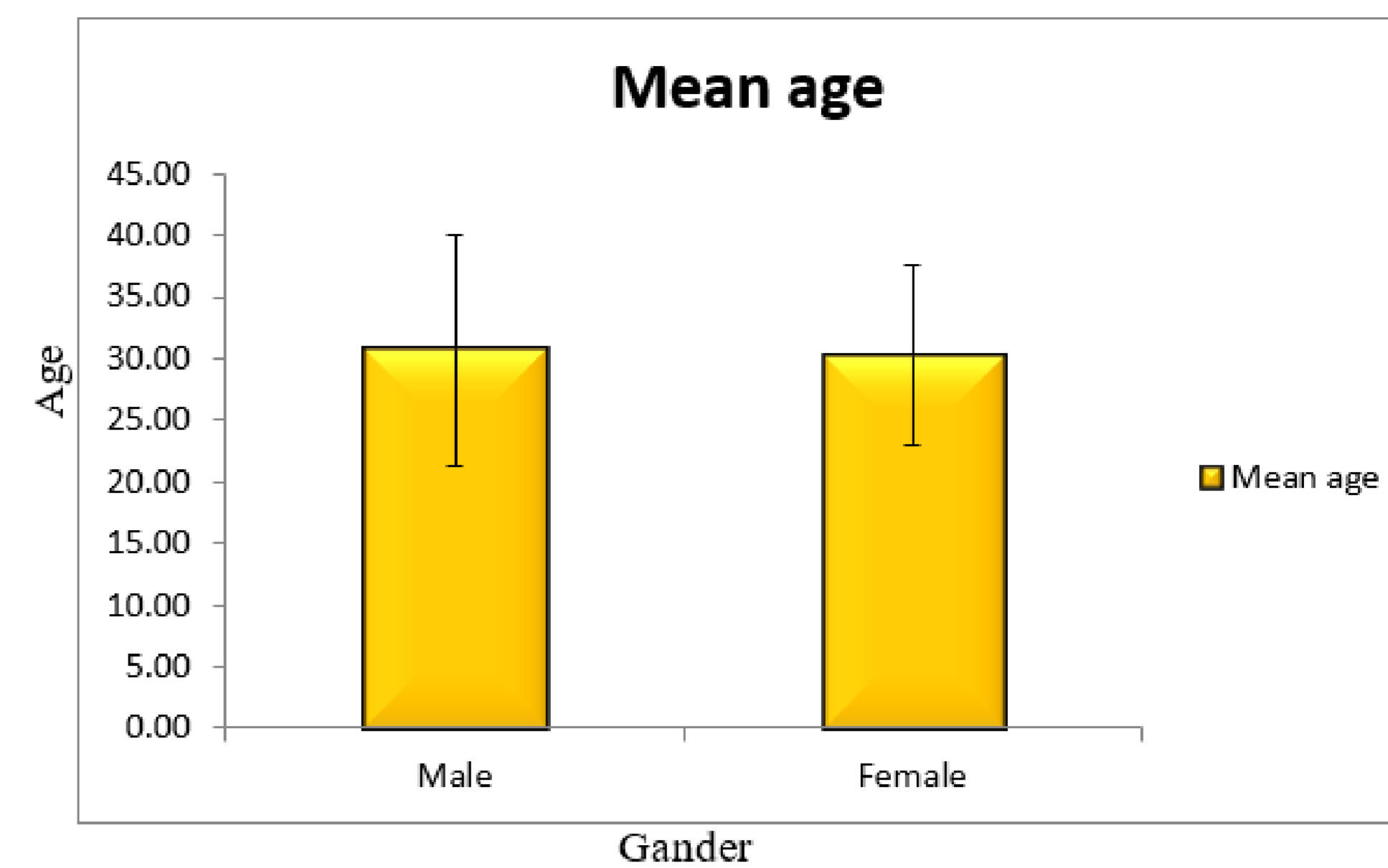
Three points to measure the labial alveolar bone thickness

Also, the buccolingual angulation of the teeth is evaluated based on the relationship between two lines, first line bisect the tooth, and the second line connect between anterior nasal spine (ANS) and posterior nasal spine (PNS).

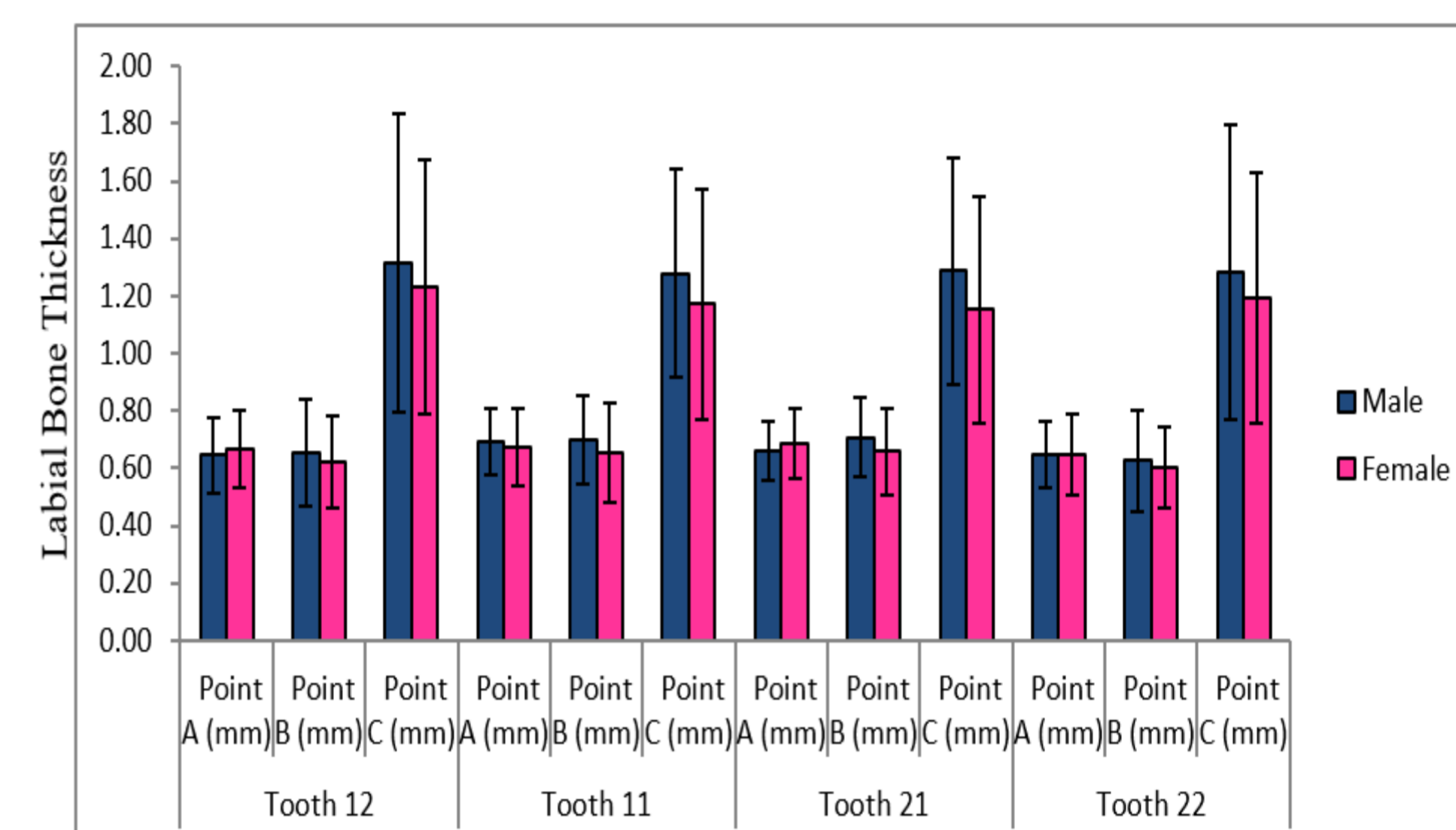


The buccolingual tooth angulation

RESULTS



(Figure 1). Distribution of mean age among males and females.



(Figure 2). Distribution of Alveolar bone thickness among males and females.

(Table 1). Correlation of Alveolar bone thickness with bucco-lingual maxillary incisors angulation.

		Alveolar Bone Thickness (ABT)			
		Point A (mm)	Point B (mm)	Point C (mm)	
Bucco-lingual maxillary incisor angulation	Tooth 12	R	-0.142	-0.396	0.288
		Sig. (2-tailed)	0.16	0.001*	0.004*
		N	99	99	99
	Tooth 11	R	-0.185	-0.113	0.275
		Sig. (2-tailed)	0.067	0.264	0.006*
		N	99	99	99
	Tooth 21	R	-0.238	-0.189	0.314
		Sig. (2-tailed)	0.017*	0.061	0.002*
		N	99	99	99
	Tooth 22	R	0	-0.252	0.324
		Sig. (2-tailed)	0.999	0.012*	0.001*
		N	98	98	98

*Statistical significance set at 0.05; R: Pearson Correlation coefficient; N: Number of samples

DISCUSSION

- There was no significant differences ($P > .05$) between the sexes. These findings are consistent with prior reports. (Lee et al., 2019).
- The labial alveolar bone thickness at the apical level had a moderate positive linear connection with the inclination of the maxillary incisors (Point C). This research supports a previous study. (Hong et al., 2019).
- Lee et al reported that in a study done in Korean participants the labial bone thickness was less than 2 mm. (Lee et al., 2019).

CONCLUSION

- The majority of the cases in the present study had less than 2 mm of labial bony wall thickness at Point A, B, and C among central and lateral incisors.
- Buccolingual angulation of the maxillary incisors and labial alveolar bone thickness are correlated.
- This is vital to know when performing dental procedures such as tooth extraction or immediate implantation in the anterior regions.

REFERENCES

