

Peer Review File

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Reviewer A

Comment 1:

No specific details regarding patient consent. Your manuscript does not contain a complete IRB statement regarding ethics board approval. Original articles need to contain a statement about the Helsinki Declaration of 1975, as in the example given here: “This study was approved by the human subjects ethics board of XXXXX and was conducted in accordance with the Helsinki Declaration of 1975, as revised in 2013.

Reply 1: Information related to approval of Ethics Committee and patient consent has been added to the manuscript. (Page 4, line 65-68)

Changes in the text:

This study was approved by the Ethics Committee of the Nanjing Stomatological Hospital, and was conducted in accordance with the Helsinki Declaration of 1975, as revised in 2013. The samples measured in this study were from patients who had taken craniofacial CBCT in Nanjing Stomatological Hospital and obtained authorization from all patients.

Comment 2:

There are no details of image acquisition: kVp, mA, FOV and acquisition time

Observers: Years of practice? Where were the analyses performed (computer details)?

There must be much more detail about how the images were measured and calculated. Please, include figures that show the measurements for those of us who have not done this by ourselves.

Reply 2:

We have added details of the materials and methods related to the measurement as suggested. Figure 1 and legend have also been modified accordingly.

Changes in the text:

1. The operation was carried out according to the manufacturer's instructions with 110kV, 5mA, 0.125mm voxel size, 1.8s exposure time, and the scope of the image was $160 \times 160 \times 150$ cubic mm. (Page 4, line 79-82)
2. All image data were measured independently by two observers (orthodontists with more than 5 years of practice). (Page 5, line 103-104)
3. All operations were performed in a 29.7-inch RadiForce MX300 W (Eizo Nanao Corporation, Hakusan, Japan) screen with a resolution of 2560×1600 pixels. (Page 5, line 85-87)
4. Details about image measurements have been modified as below (Page 5, line 88-102):

The measurement markers were defined on the reconstructed CBCT image (Figure 1A and B). According to the value of Frankfurt-mandibular plane angle (FMA), these patients' vertical facial patterns were divided into three types: high-angle facial pattern ($FMA > 32^\circ$), average-angle facial pattern (FMA ranging from 22° to 32°) and low-angle facial pattern ($FMA < 22^\circ$). In the sagittal direction, according to the value of ANB, patients were divided into Class I (ANB ranging from 0° to 4°), Class II ($ANB > 4^\circ$), and Class III ($ANB < 0^\circ$).

To find the best section for measuring the thickness of alveolar bone, we selected the layer with the largest cross-sectional area of anterior tooth in the horizontal section of the CBCT (Figure

1C) . Then we connected the most protruding points on the lingual side and labial side of the tooth, and make a vertical section with this line as the measuring plane of the tooth (Figure 1D) . By making a line parallel to the axis of the teeth through alveolar bone crest (M point on the labial side, N point on the lingual side), we measured the width of alveolar bone wall at three locations: 1, 3, and 5mm apical to M/N point (S1, S2, S3, as shown in figure 1D and E).

5. Figure 1 has been fine-tuned, and the annotation of the landmarks is added in the legend:

Landmarks in cephalometry: P, Porion; Or, Orbitale; N, Nasion; A, Subspinale; B, Supramental; Go, Gonion; Gn, Gnathion; M, alveolar bone crest on the labial side; Q, alveolar bone crest on the lingual side. (see Page 17, line 335-337)

Comment 3:

The Limitations section should be included to comprise concerns raised in Weaknesses.

Reply 3: We added "Limitations of the study" at the end of the manuscript. (Page 11, line 224-230)

Changes in the text:

The samples in different skeletal types were not individually matched for age; however, all subjects were at craniofacial maturity, rendering anatomic differences in the jaws or alveolar bone unlikely to have influenced the results. The ANB and FMA angle were used to differentiate the samples, neither of which may have been an ideal measure of sagittal or vertical discrepancy in all circumstances. A sample with a broader variety of malocclusions might yield different findings.

Reviewer B

Comment 1:

Title: Maybe you should include the population type in it.

Relationship between different skeletal facial types and anterior alveolar bone thickness with cone-beam computed tomography in an Asian population

Reply 1: The title has been modified according to the suggestion. (Page 1, line 1-2)

Changes in the text:

Relationship between different skeletal facial types and anterior alveolar bone thickness with cone-beam computed tomography in an Asian population

Comment 2:

Objective: Please, include the population type

To investigate the relationship between different skeletal facial types and anterior alveolar bone thickness using cone-beam computed tomography (CBCT) in an Asian population.

Reply 2: The objective has been modified according to the suggestion. (Page 1, line 4-6)

Changes in the text:

To investigate the relationship between different skeletal facial types and anterior alveolar bone thickness with cone-beam computed tomography (CBCT) in an Asian population.

Comment 3:

Abstract Conclusion: In my opinion, the only conclusion of this study is number 2 (below). The other ones (1 and 3) are comments and opinions that you should highlight in the discussion part of the paper.

1. Orthodontists have a greater safe range of movement when retracting maxillary anterior teeth

of men than that of women.

2. With the increase of FMA, the anterior alveolar bone gradually became thinner.

3. High-angle subjects may be at increased risk of alveolar bone resorption when their incisors are moved inward.

Reply 3:

The content of conclusion number 1 has been modified. Conclusion 3 has been deleted and highlighted in the discussion part. (Page 1-2, line 21-23)

Changes in the text:

Conclusion: The lingual alveolar bone of the maxillary anterior teeth is thicker in males than in females. With the increase of FMA, the anterior alveolar bone gradually became thinner.

Comment 4:

Line 2 186-187 – Please, include the references for the statement: “After several years of stabilization, however, alveolar bone resorption occurs to varying degrees as the prevalence of periodontal disease increases significantly”.

Reply 4: Relevant references have been attached to the manuscript. (Page 9, line 177)

Changes in the text:

Relevant references (Page 15, line 295-298):

19. Ebersole, J.L., et al., *Ageing effects on humoral immune responses in chronic periodontitis. J Clin Periodontol*, 2018. 45(6): p. 680-692.

20. Ebersole, J.L., et al., *Aging, inflammation, immunity and periodontal disease. Periodontol 2000*, 2016. 72(1): p. 54-75.

Comment 5:

Lines 198-199 – What do you mean by this sentence? “This may be because objects in different regions may lead to different conclusions.” It’s not clear... you mean, Individuals from different parts of the world present different skeletal patterns? Please, clarify!

Reply 5:

We have modified this sentence to “We speculate that this discrepancy is due to that individuals from different parts of the world present different skeletal patterns”. (Page 10, line 190-191)

Changes in the text:

We speculate that this discrepancy is due to that individuals from different parts of the world present different skeletal patterns.

Comment 6:

Lines 212-215- Please, include the references for the statements in italic:

In the high-angle group, the mandible rotates backwards and downwards, resulting in a shallow anterior overbite. In this case, there is a smaller bite force in the front teeth. In the low-angle group, by contrast, the mandible showed a tendency of forward and upward rotation. These people will have deeper anterior overbites and greater bite forces.

Reply 6: Relevant references have been attached to the manuscript. (Page 10, line 208)

Changes in the text (Page 15-16, line 310-318):

25. *Freudenthaler, J.W., A.G. Celar, and B. Schneider, Overbite depth and anteroposterior dysplasia indicators: the relationship between occlusal and skeletal patterns using the receiver*

operating characteristic (ROC) analysis. Eur J Orthod, 2000. 22(1): p. 75-83.

26. *Badiee, M., A. Ebadifar, and S. Sajedi, Mesiodistal angulation of posterior teeth in orthodontic patients with different facial growth patterns. J Dent Res Dent Clin Dent Prospects, 2019. 13(4): p. 267-273.*

27. *Custodio, W., et al., Occlusal force, electromyographic activity of masticatory muscles and mandibular flexure of subjects with different facial types. J Appl Oral Sci, 2011. 19(4): p. 343-9.*

Comment 7:

Conclusion: I recommend including the population type, as follows:

Although the factors affecting the morphology of alveolar bone are complex, we can find some clues to make a preliminary judgment of the thickness of alveolar bone in Asian patients evaluated.

Reply 7: The conclusion has been modified according to your suggestion. (Page 12, line 233-234)

Changes in the text:

Although the factors affecting the morphology of alveolar bone are complex, we can find some clues to make a preliminary judgment of the thickness of alveolar bone in patients in Asian patients.

Comment 8:

Figure 1D and legend– Please, review this figure as the tooth looks shortened...maybe you should change the image, with a tooth with a normal root-crown ratio. Figure 1D is not a schematic diagram of measuring alveolar bone thickness. It is a CBCT image with some marks on it.

Reply 8:

Figure 1D has been replaced with a tooth with a normal root-crown ratio.

The legend of Figure 1D has been modified as “the longitudinal section of anterior tooth with markers for measuring alveolar bone thickness”. (Page 16, line 331-334)

Changes in the text:

A and B, determining the landmarks used for cephalometric measurement. C, the horizontal section with the largest cross-sectional area of anterior teeth. D, the longitudinal section of anterior tooth with markers for measuring alveolar bone thickness. E, schematic diagram of markers for measuring alveolar bone thickness.

Comment 9:

Legends of Figures 2 and 3 should be rewritten – Legend should indicate what kind of analysis was done and not the result.

Reply 9: we have modified our legends as advised.

Changes in the text:

1. The legend of Figure 2 has been modified as “The lingual alveolar bone thickness of maxillary anterior teeth in male and female. Independent-samples T-test was used to compare differences between the two groups. (*P<0.05)”. (Page 17, line 339-341)
2. The legend of Figure 3 has been modified as “The thickness of lingual alveolar bone among the three vertical bone profiles. One-way ANOVA was used to analyze values for different groups. (*P<0.05)”. (Page 17, line 343-344)