OPTIMIZING MANDIBULAR RESHAPING EXPECTATIONS AT THE INITIAL CLINICAL ASSESSMENT: GONIAL ANGLE AS A PREDICTOR OF INFERIOR ALVEOLAR NERVE DISTANCE

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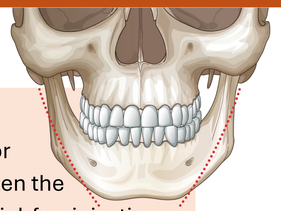
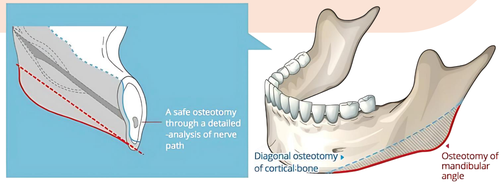
BACKGROUND



Mandibular recontouring is a desirable procedure for patients with strong jawlines who are looking to soften the lower facial third, as well as for those seeking facial feminization for gender affirmation surgery. The inferior alveolar nerve (IAN) is the most critical anatomical structure when performing mandibular reduction surgery. It is recommended that the osteotomy be at least 3 mm away from the mandibular canal to prevent nerve damage.[1] Proper precautions before surgery, such as obtaining panoramic x-rays or cone-beam computerized tomography (CBCT) imaging, are essential to avoid nerve damage.

Previous studies have compared the distance of the IAN from the gonion in individuals with subjective square faces versus norms in Asian populations, concluding safe resection limits of 20 mm or less in women and 22 mm or less in men.[2] However, the IAN location has not yet been compared to gonial angle measurements in a diverse population.

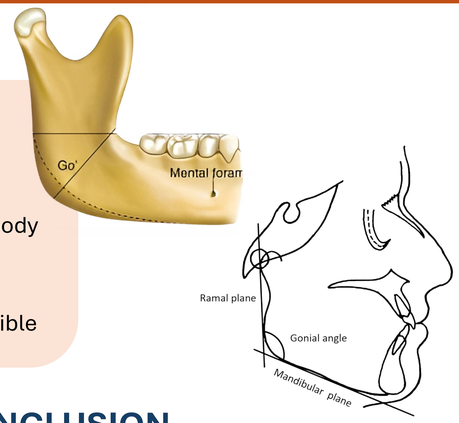


OBJECTIVES

1. Determine the distance between the mandibular canal and gonion in a diverse population using CBCT
2. Compare the nerve distances to gonial angle.
3. Assess differences between male and female measurements.

METHODS

- Retrospective study using CBCT images of diverse patients
- Excluded if images were blurry or if patient had a history of jaw trauma, jaw surgery, craniomaxillofacial disorders, mandibular pathology, missing mandibular molars
- An oblique line was drawn from the intersection of the anterior ramus and the superior border of the mandibular body to the most inferior posterior point of gonion.
- Distance between the inferior border of the mandibular canal and gonion along this line was measured
- Angle of the mandible was then measured using the posterior border of the ramus and inferior border of the mandible



RESULTS

- 200 CBCTs of patients aged 21-40 were reviewed. Final sample included 82 male and 82 female patients totaling 164 patients.
- There were no significant differences between the right and left mandibular nerve locations (P = .41). Right and left measurements were averaged keeping N=164.
- Mean IAN distance from gonion for all patients was 17.5 mm.
- Average distance was significantly different in males 18.22 ± 0.833 mm versus females 16.76 ± 0.646 mm (P < 0.01)
- Mean male gonial angle 116.5° and mean female gonial angle 117.9° (P= *0.187*)
- There was a negative correlation between the gonial angle and the distance of the nerve from gonion, with a smaller angle correlating with a greater nerve distance (r = -0.82). Figure 1

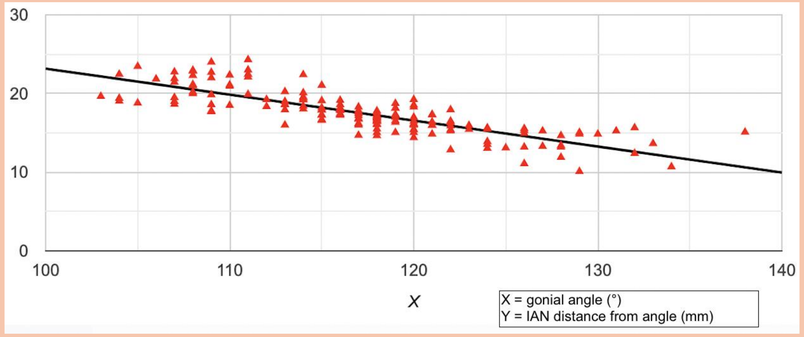


Figure 1: Relationship Between Gonial Angle (°) and IAN Distance from Gonion (mm)

CONCLUSION

Masculine angles are considered to be 100-120°. Nearly all measured nerves were at least 15 mm from gonion in this range. This assessment provides data that can improve initial expectations for patients inquiring about jaw reduction surgery, suggesting that a safe angle reduction is closer to 13 mm in a diverse population. It also indicates that a more acute gonial angle allows for greater room for reduction. While this study offers an estimation for mandibular reduction, the variability in nerve location underscores the importance of individualized preoperative planning and imaging to maximize aesthetic outcomes while minimizing the risk of nerve damage during surgery.

References

1. Park, S. (Ed.). (2017). Facial bone contouring surgery: A practical guide. Springer Singapore Pte. Limited.
2. Lo, L. J., Wong, F. H., & Chen, Y. R. (2004). The position of the inferior alveolar nerve at the mandibular angle: An anatomic consideration for aesthetic mandibular angle reduction. Annals of Plastic Surgery, 53(1), 50–55.

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