

# Facial geometry: A systematic review of facial angles and aging

Morgan Murphrey MD<sup>1</sup>, Michelle Vy MD<sup>1,2</sup>, Suzanne Kilmer MD<sup>1,2</sup>

<sup>1</sup>UC DAVIS, DEPARTMENT OF DERMATOLOGY, SACRAMENTO CA

<sup>2</sup>LASER & SKIN SURGERY CENTER OF NORTHERN CALIFORNIA, SACRAMENTO, CA

The authors have no relevant disclosures

# Introduction

With an understanding of facial anatomy comes an inherent understanding of facial angles.

Although physicians commonly see and frequently recognize this in clinical practice, facial angle measurements and data on how aging effects them is lacking.

# Methods

***Our objective: review the literature to summarize current knowledge and highlight future directions***

- ▶ A systematic review of the literature was performed via the PubMed database. Key search terms included: “skin aging,” “facial aging,” and “angle.”
- ▶ 179 articles were identified, which were reviewed for relevancy.
- ▶ In total, 16 articles discussed facial angles and aging, including original research and case or literature reviews.

# Results

- ▶ Of the 16 articles, 3 utilized CT scan or other imaging techniques to evaluate angles based on bone structure.
- ▶ There were 12 articles which evaluated facial angles via photographic review or clinical assessment, with each addressing various parts of the face.

From the anterior view, primary angles described included (A) brow peak, (B) canthus-oral-nasal, (C) oral-tragus-mental, and (D) nasolabial.

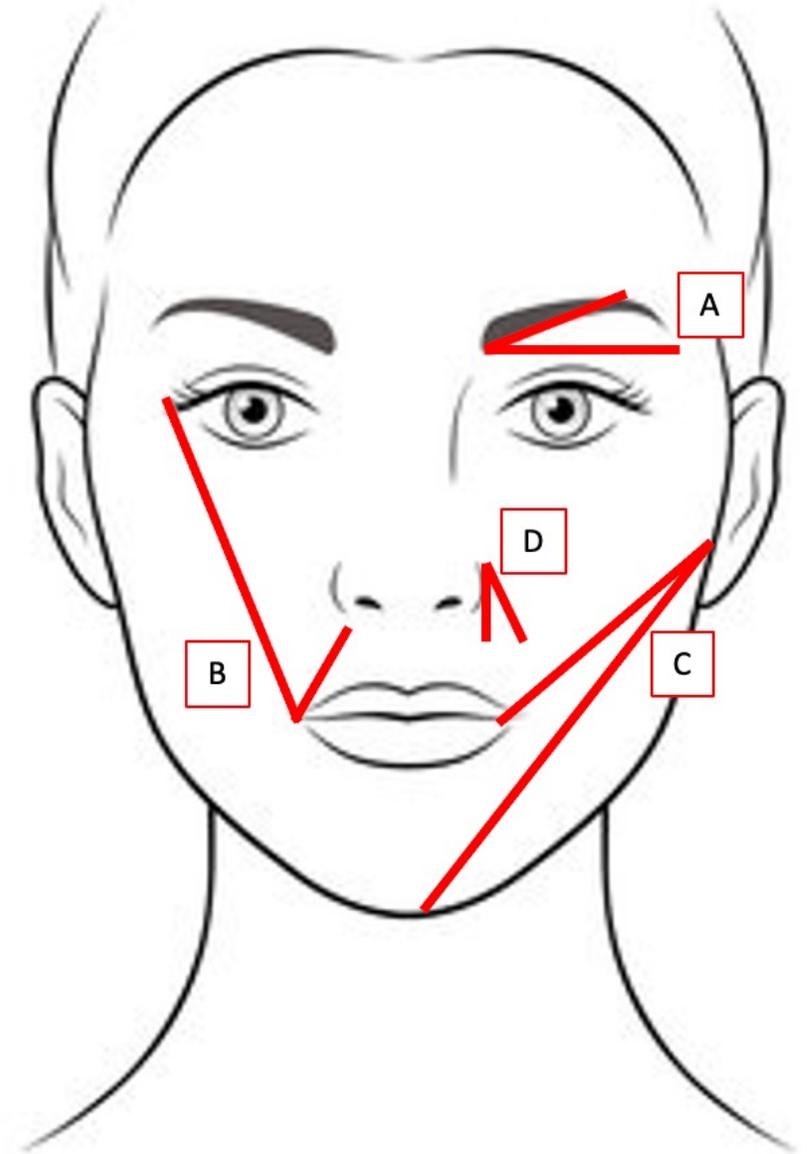


Figure 1

From the lateral view, angles described included (A) columellar-labial, (B) naso-mental, (C) facial, and (D) cervicomental.

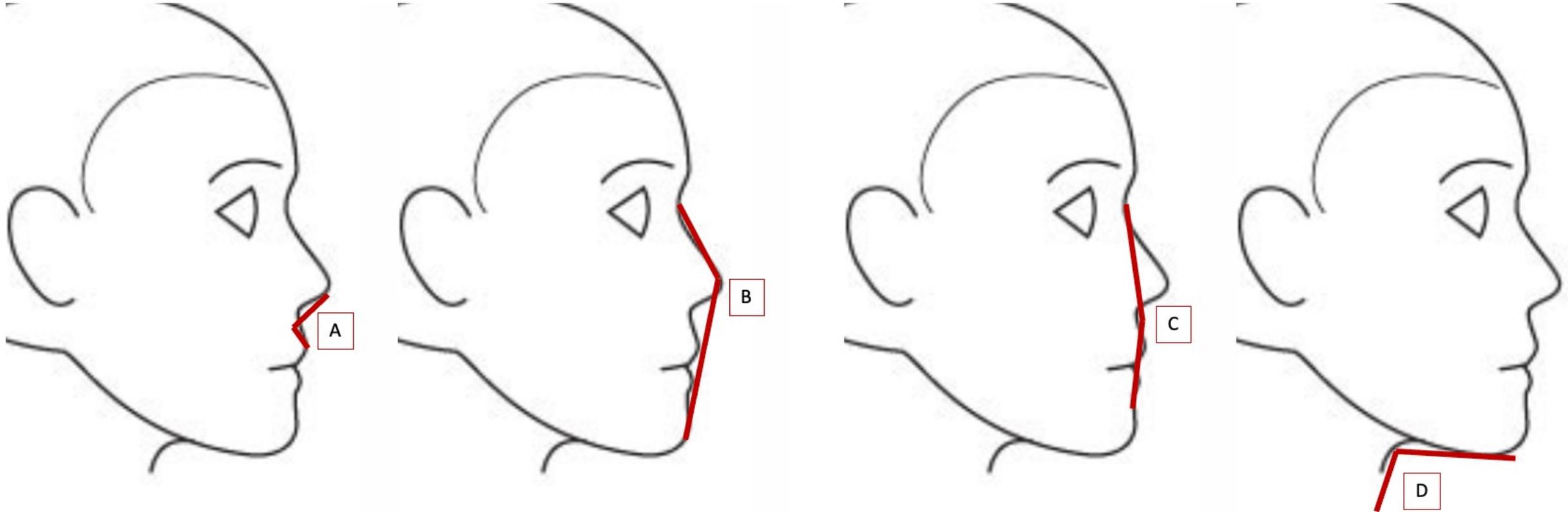


Figure 2

# Results

- ▶ Of these, cervicomental (Fig 2, D) is the most well described and studied, with the consensus that a cervicomental between 105-120° is most youthful and becomes more obtuse with age.<sup>1</sup>
- ▶ Brow peak angle (Fig 1, A) decreases with age by gravity induced ptosis.<sup>2</sup>
- ▶ The canthus-oral-nasal angle (Fig 1, B) similarly decreases with age, as the oral commissure falls.<sup>2</sup>

# Results

- ▶ The oral-tragus-mental angle (Fig 1, C) reflects the entire lower face, and from an anterior view the distance between the oral commissure and mental crease is a better metric of facial aging versus the angle.
- ▶ The nasolabial angle, defined as the degree between a vertical line at the nose and the end of the shadow (Fig 1, D) also increases with age.<sup>3</sup>
- ▶ From a lateral view, the naso-mental, facial and cervicomental angles (Fig 2, B-D) all increase with age, while the columellar-labial angle (Fig 2, A) decreases with age.<sup>1,4-6</sup>

# Conclusions

- ▶ Accurate assessment of facial features and symmetry is imperative for successful cosmetic outcomes, and there are geometric trends seen with aging.
- ▶ While many seasoned physicians may instinctively assess facial angles, there has been minimal effort to study and standardize facial angle assessment.
- ▶ These easy to measure angles can be used in-office to help patients appreciate subtle differences that may not be immediately noticeable or quantifiable by an untrained eye.
- ▶ Further evaluation of these specific angles may offer useful insight for cosmetic facial assessment.

# References

1. Ellenbogen R, Karlin JV. Visual criteria for success in restoring the youthful neck. *Plast Reconstr Surg*. 1980;66(6):826-837.
2. Tsai LC, Lin ET, Chang CC, et al. Quantitative and objective measurements of facial aging process with anatomical landmarks. *J Cosmet Dermatol*. 2022;21(3):1317-1320.
3. Jang SI, Kim EJ, Park H, et al. A quantitative evaluation method using processed optical images and analysis of age-dependent changes on nasolabial lines. *Skin Res Technol*. 2015;21(2):201-206.
4. Felix Bravo B, Bianco S, de Bastos JT, Luiz Lopes F, Alcala Gelpi B, Goncalves Bravo L. Analysis of the Columellar-Labial Angle in Perioral Aging. *Aesthet Surg J*. 2021;41(6):NP255-NP259.
5. Bravo BSF, Carvalho RM, Iggncacio CA, Bianco S, Bravo LG. Effect of the aging process on columella-labial, nasomental and facial angles and how to apply it in clinical practice. *J Cosmet Dermatol*. 2020;19(12):3383-3388.
6. van de Lande LS, Eyck BM, Mooij JJ, Stevens HP, van Dongen JA. The Rainbow Scale for the Assessment of the Cervicomental Angle: A Validated Scale. *Aesthet Surg J*. 2020;40(9):931-937.