EDITORIAL

Reporting of Implant Positions in Completely Edentulous Arches Needs to be Standardized

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Edentulous patients (fully edentulous or at least one edentulous arch) are generally restored with either fixed or removable restorations. A one-piece full-arch fixed dental prosthesis can be supported by a minimum of two anterior axial plus two posterior distally tilted implants or by six to eight axial implants symmetrically distributed through the posterior and anterior regions of the arch.[1] For removable prosthesis, the mandibular arch is commonly restored with 2-implant mandibular overdentures (2IMO) and the maxillary arch is restored with four implants.[2–4] For 2IMOs patients, placement of two parallel implants in the canine positions on both sides is a common clinical practice.[3] The number of implants per jaw ranged between 2 and 9 in the maxilla or mandible. The systematic review[4] indicated no relationship between the number of implants used to support a complete prosthesis with implant survival rate, prosthesis survival rate, prosthesis complications, or marginal bone loss in studies with follow-up periods of between 5 and 15 years.[4] Seventeen prospective studies comparing mandibular implant-supported fixed full arch restorations were reviewed,[5] including 501 patients and 2827 implants. The majority of the implants (88.5%) were found to be placed in the interforaminal region and the number of supporting implants and the anteroposterior implant distribution had no influence ($p > 0.05$) on the implant survival rate.[5] In most of the studies, the position of the implants is usually indicated with the corresponding tooth position.[3,6,7] However, tooth positions may vary depending upon the jaw size and shape with different demographics of an individual.

The safe zone measurements in relation to the genial tubercle obtained from the cone-beam computed tomography can help clinicians determine implant positions from the midline in a complete edentulous mandible.[8] Similarly, there is a need to identify the palpable anatomical landmark in the midline that can be easily identifiable in the radiographic image to measure the implant positions.. Reporting of the implant positions is still not standardized in completely edentulous arches both for fixed and removable restorations. Only a few *in vitro* studies[9,10] indicated the specific implant positions from the midline of the arch. Hong et al.[9] carried out finite element analysis (FEA) to evaluate the peri-implant crestal bone stresses in 2IMOs, with implants positioned at 7, 14, and 21 mm from the midline and concluded that the lowest stresses were observed in the lateral incisor position. Patil et al.[10] carried out an FEA study to evaluate the stress and strain distribution patterns in 2IMO with different positions when the implant was placed at different positions, 5, 10, 15, and 20 mm from the midline, and concluded that the most posterior position of implants (20 mm) exhibited the highest stresses.

To the best of the author's knowledge, there is no clinical study that indicated the implant positions in a specific unit of length (in millimeters) from the midline and still, the tooth position is considered a general guideline to indicate the implant position in edentulous arches. There is a need to specify the implant position from the midline in millimeters to standardize and facilitate reliable and valid research methodology.

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References

1. Messias A, Nicolau P, Guerra F. Different interventions for rehabilitation of the edentulous maxilla with implant-supported prostheses: an overview of systematic reviews. Int J Prosthodont 2021;34:s63–s84. DOI: 10.11607/ijp.7162
2. Feine JS, Carlsson GE, Awad MA, et al. The McGill consensus statement on overdentures. Mandibular two-implant overdentures as first choice standard of care for edentulous patients. Gerodontology 2002;19(1):3–4.
3. Patil PG, Seow LL. Cresta bone-level changes and patient satisfaction with mandibular overdentures retained by one or two implants with immediate loading protocols: A randomized controlled clinical study. J Prosthet Dent 2020;123(5):710–716. DOI: 10.1016/j.prosdent.2019.07.015
4. de Luna Gomes JM, Lemos CAA, Santiago Junior JF, et al. Optimal number of implants for complete-arch implant-supported prostheses with a follow-up of at least 5 years: A systematic review and meta-analysis. J Prosthet Dent 2019;121(5):766–774.e3. DOI: 10.1016/j.prosdent.2018.06.001
5. Papaspyridakos P, Mokti M, Chen CJ, et al. Implant and prosthodontic survival rates with implant fixed complete dental prostheses in the edentulous mandible after at least 5 years: a systematic review. Clin Implant Dent Relat Res 2014;16(5):705–717. DOI: 10.1111/cid.12036
6. ELsyad MA, Maryod WH, Mostafa AZ. Effect of implant position on clinical and radiographic outcomes of locator-retained mandibular overdentures: a 1-year prospective study. J Prosthodont 2019;28(2):e699–e704. DOI: 10.1111/jopr.12780
7. Takagaki K, Gonda T, Maeda Y. Number and location of mini-implants retaining a mandibular overdenture to resist lateral forces: a

preliminary in vitro study. Int J Prosthodont 2017;30(3):248–250. DOI: 10.11607/ijp.4995
8. Voon YS, Patil PG. Safe zone in anterior mandible related to the genial tubercle for implant osteotomy in a Chinese-Malaysian population: A CBCT study. J Prosthet Dent 2018;119(4):568–573. DOI: 10.1016/j.prosdent.2017.05.011
9. Hong HR, Pae A, Kim Y, et al. Effect of implant position, angulation, and attachment height on peri-implant bone stress associated with mandibular two-implant overdentures: a finite element analysis. Int J Oral Maxillofac Implants 2012;27(5):e69–76.
10. Patil PG, Seow LL, Uddanwadikar R, et al. Stress and strain patterns of 2-implant mandibular overdentures with different positions and angulations of implants: A 3D finite element analysis study. J Prosthet Dent 2022. DOI: 10.1016/j.prosdent.2021.07.025