

## COMPARISON OF TOOTH WIDTHS AND BOLTON RATIOS MEASURED ON PLASTER CASTS VERSUS DIGITAL MODELS: A PILOT STUDY

Melina Koukou<sup>1</sup>, Nikolaos Kazanopoulos<sup>1</sup>, Dimitrios Konstantonis<sup>1</sup>, Dimitrios Vasileiou<sup>1</sup>, Heleni Vastardis<sup>1</sup>

<sup>1</sup>Department of Orthodontics, School of Dentistry, National and Kapodistrian University of Athens, 2 Thivon str., Athens 11527, Greece.

### References

1. Stevens DR, Flores-Mir C, Nebbe B, Raboud DW, Heo G, Major PW. Validity, reliability, and reproducibility of plaster vs digital study models: comparison of peer assessment rating and Bolton analysis and their constituent measurements. *Am J Orthod Dentofacial Orthop.* 2006 Jun;129(6):794-803. doi: 10.1016/j.ajodo.2004.08.023. PMID: 16769498.
2. Camardella LT, Breuning H, de Vasconcellos Vilella O. Accuracy and reproducibility of measurements on plaster models and digital models created using an intraoral scanner. *J Orofac Orthop.* 2017 May;78(3):211-220. English. doi: 10.1007/s00056-016-0070-0. Epub 2017 Jan 10. PMID: 28074260.
3. Liang YM, Rutchakitprakarn L, Kuang SH, Wu TY. Comparing the reliability and accuracy of clinical measurements using plaster model and the digital model system based on crowding severity. *J Chin Med Assoc.* 2018 Sep;81(9):842-847. doi: 10.1016/j.jcma.2017.11.011. PMID: 29395944.
4. Yılmaz H, Özlü FÇ, Karadeniz C, Karadeniz Eİ. Efficiency and Accuracy of Three-Dimensional Models Versus Dental Casts: A Clinical Study. *Turk J Orthod.* 2019 Dec 1;32(4):214-218. doi: 10.5152/TurkJOrthod.2019.19034. PMID: 32110466; PMCID: PMC7018491.
5. Bukhari, Syed Abid & Aileni, Kaladhar & Reddy, Madhukar & Shah, Sheeba. (2016). Evaluation of Virtual models (3Shape Ortho System) in assessing accuracy and duration of model analyses based on the severity of crowding. *The Saudi Journal for Dental Research.* 8. 10.1016/j.sjdr.2016.05.004.
6. Reuschl RP, Heuer W, Stiesch M, Wenzel D, Dittmer MP. Reliability and validity of measurements on digital study models and plaster models. *Eur J Orthod.* 2016 Feb;38(1):22-26. doi: 10.1093/ejo/cjv001. Epub 2015 Feb 27. PMID: 25724574.
7. Lemos LS, Rebello IM, Vogel CJ, Barbosa MC. Reliability of measurements made on scanned cast models using the 3 Shape R 700 scanner. *Dentomaxillofac Radiol.* 2015;44(6):20140337. doi: 10.1259/dmfr.20140337. Epub 2015 Feb 27. PMID: 25651273; PMCID: PMC4628398.
8. Gül Amuk N, Karsli E, Kurt G. Comparison of dental measurements between conventional plaster models, digital models obtained by impression scanning and plaster model scanning. *Int Orthod.* 2019 Mar;17(1):151-158. doi: 10.1016/j.ortho.2019.01.014. Epub 2019 Feb 13. PMID: 30772351.
9. Shailendran A, Weir T, Freer E, Kerr B. Accuracy and reliability of tooth widths and Bolton ratios measured by ClinCheck Pro. *Am J Orthod Dentofacial Orthop.* 2022 Jan;161(1):65-73. doi: 10.1016/j.ajodo.2020.06.048. Epub 2021 Aug 18. PMID: 34417034.
10. Amornvit P, Rokaya D, Sanohkan S. Comparison of Accuracy of Current Ten Intraoral Scanners. *Biomed Res Int.* 2021 Sep 13;2021:2673040. doi: 10.1155/2021/2673040. PMID: 34552983; PMCID: PMC8452395.

11. Kumar AA, Ananthakrishnan MG, Kumar S, Divakar G, Sekar S, Dharani S. Assessing the Validity and Reliability of Tooth Widths and Bolton Ratios Obtained from Digital Models and Plaster Models. *J Pharm Bioallied Sci.* 2022 Jul;14(Suppl 1):S148-S151. doi: 10.4103/jpbs.jpbs\_735\_21. Epub 2022 Jul 13. PMID: 36110640; PMCID: PMC9469417.
12. Pellitteri F, Albertini P, Vogrig A, Spedicato GA, Siciliani G, Lombardo L. Comparative analysis of intraoral scanners accuracy using 3D software: an in vivo study. *Prog Orthod.* 2022 Jul 4;23(1):21. doi: 10.1186/s40510-022-00416-5. PMID: 35781850; PMCID: PMC9250910.
13. Hannebauer A, Wesemann C, Bartzela T, Bister D, Bumann A. Comparison of automated digital Peer Assessment Rating compared with measurements performed by orthodontists, dental students, and assistants using plaster, additive manufactured, and digital models. *Eur J Orthod.* 2022 Sep 19;44(5):588-594. doi: 10.1093/ejo/cjac025. PMID: 35731637.
14. Czarnota J, Hey J, Fuhrmann R. Measurements using orthodontic analysis software on digital models obtained by 3D scans of plaster casts : Intrarater reliability and validity. *J Orofac Orthop.* 2016 Jan;77(1):22-30. doi: 10.1007/s00056-015-0004-2. Epub 2016 Jan 11. PMID: 26753549.