

POLOŽAJ JEZIKA PRI PANORAMSKEM SLIKANJU ZOB

TONGUE POSITION IN PANORAMIC DENTAL IMAGING

Slavko Grašič¹, Luka Kerezović¹, Karmen Požnenl-Upelj², Nejc Mekiš¹

¹ Univerza v Ljubljani, Zdravstvena fakulteta, Oddelek za radiološko tehnologijo, Zdravstvena pot 5, 100 Ljubljana

² Zdravstveni dom Ljubljana, PE Kotnikova, Stomatološka slikovna diagnostika, Kotnikova 36, 1000 Ljubljana

Korespondenca / Corresponding author: izr. prof. dr. Nejc Mekiš, nejc.mekis@zf.uni-lj.si

Prejeto/Recived: 31. 1. 2024

Spregeto/Accepted: 26. 2. 2024

IZVLEČEK

Uvod in namen: Panoramsko slikanje zob z minimalnim odmerkom ionizirajočega sevanja zajame celotno ustno votlino na eni sliki. Pogosta napaka pri tej tehniki slikanja je napačen položaj jezika, kar se kaže kot temen pas na rentgenski sliki, ki prekrije korenine zob v zgornji čeljusti. Cilj raziskave je bil ugotoviti, ali ima plakat kot vizualni vir navodil vpliv na razumevanje pacientov ter s tem zmanjšuje napake pri položaju jezika.

Metode: Raziskavo smo izvedli z uporabo kvantitativne (eksperimentalne) raziskovalne metode. Po prvotnem pregledu 1500 slik v treh mesecih smo ustvarili tri različne plakate z navodili za pravilen položaj jezika pri panoramskem slikanju zob. Plakati so bili tri mesece izobešeni v čakalnici ZD Ljubljana, po 3 mesecih pa smo ponovno analizirali 1500 slik, ki so nastale v tem obdobju.

Rezultati: Rezultati kažejo, da je odstotek napačnega položaja jezika znašal 36,1 %, ko plakati niso bili nameščeni, in 36 %, ko so bili nameščeni, torej so razlike minimalne oziroma skoraj nične. Opazili smo izboljšanje pravilnosti položaja jezika, če smo šteli slike z zrakom, ki so bile sicer še vedno diagnostično uporabne, kot napačne. Število pravih položajev se je povečalo s 34,1 % na 42 %. Glede na spol so imele ženske tako brez plakata kot z njim nekoliko boljše rezultate pri ustreznem položaju jezika med slikanjem. Pri otrocih, slikanih brez plakata, smo ugotovili največ napačnih položajev jezika (66 %), vendar smo pri njih ob namestitvi plakatov opazili tudi znatno izboljšanje v pravilnosti položaja jezika.

Razprava in zaključek: Raziskava je pokazala, da namestitev plakatov ni bistveno vplivala na izboljšanje pravilnosti položaja jezika pri panoramskem slikanju zob, saj je bil odstotek pravih položajev jezika pred in po plakatu skoraj enak. Spol ni ključni dejavnik pri vplivu na pravilnost položaja jezika, medtem ko so se pojavile nekatere razlike v izboljšanju pravilnosti glede na starostno skupino.

Ključne besede: panoramsko slikanje zob, položaj jezika, plakati z navodili, napake pri slikanju zob, zobni rentgen

ABSTRACT

Introduction and purpose: In dental panoramic imaging the entire oral cavity is captured in a single image with a minimal dose of ionizing radiation. A common error in this imaging technique is the incorrect position of the tongue, which is visible as a dark band on the radiograph and obscures the roots of the teeth in the maxilla. The aim of the study was to determine whether a poster, which serves as a visual teaching aid, influences the patient's understanding and thus reduces errors in tongue positioning.

Methods: The study was conducted using a quantitative (experimental) research method. In the first part of the study, 1500 images were analyzed over a three-month period to determine the number of cases with errors due to incorrect tongue positioning. Three different posters were then created as a visual guide to correct tongue position in dental panoramic imaging. These posters were hung in the waiting room of the Community Health Centre Ljubljana for three months, and then another 1500 images were analyzed over the following three months.

Results: The results show that the percentage of incorrect tongue positions was 36.1% when no posters were hung and 36% when they were hung, indicating minimal or almost negligible differences. An improvement in tongue position accuracy was observed when images with air, but which were still diagnostic, were categorized as incorrect. The number of correct tongue positions increased from 34.1% to 42%. In terms of gender, females achieved slightly better results in tongue position accuracy both with and without posters. The highest percentage of incorrect tongue positions was observed in children without the poster (66 %), but a significant improvement in tongue position accuracy was observed after the poster was attached.

Discussion and conclusion: The study found that poster placement had no significant effect on the improvement of tongue position accuracy in dental panoramic images, as the percentage of correct tongue positions before and after poster placement was almost identical. Gender was not a significant factor affecting tongue position accuracy, although some differences in improvement were noted between age groups.

Keywords: panoramic dental imaging, tongue position, instructional posters, dental imaging errors, dental radiography

LITERATURA / REFERENCES

- Akarslan, Z. Z., Erten, H., Güngör, K., & Celik, I. (2003). Common errors on panoramic radiographs taken in a dental school. *The Journal of Contemporary Dental Practice*, 4(2), 24–34.
- Baydar, O., Różyło-Kalinowska, I., Futyma-Gąbka, K., & Sağlam, H. (2023). The U-Net Approaches to Evaluation of Dental Bite-Wing Radiographs: An Artificial Intelligence Study. *Diagnostics*, 13(3), 453. <https://doi.org/10.3390/diagnostics13030453>
- Bissoon, A. K., Whaites, E., Moze, K., & Naidu, R. (2012). Evaluation of common operator errors in panoramic radiography in Trinidad and Tobago: A comparison of formally vs informally trained operators. *The West Indian Medical Journal*, 61(7), 733–738.
- Dhillon, M., Raju, S. M., Verma, S., Tomar, D., Mohan, R. S., Lakhanpal, M., & Krishnamoorthy, B. (2012). Positioning errors and quality assessment in panoramic radiography. *Imaging Science in Dentistry*, 42(4), 207. <https://doi.org/10.5624/isd.2012.42.4.207>
- Fuhrmann, A. (2015). Panoramic tomography. In *Dental radiology* (pp. 90–108). Thieme.
- Granlund, C. M., Lith, A., Molander, B., Grondahl, K., Hansen, K., & Ekestubbe, A. (2012). Frequency of errors and pathology in panoramic images of young orthodontic patients. *The European Journal of Orthodontics*, 34(4), 452–457. <https://doi.org/10.1093/ejo/cjr035>
- Gupta, A., Devi, P., Srivastava, R., & Jyoti, B. (2014). Intra oral periapical radiography - basics yet intrigue: A review. *Bangladesh Journal of Dental Research & Education*, 4(2), 83–87. <https://doi.org/10.3329/bjdre.v4i2.20255>
- Iannucci, J., & Howerton, L. J. (2017). *Dental radiography: Principles and techniques* (5th ed.). Elsevier/Saunders.
- Jeong, C. (2017, July). *Extraoral panoramic errors: A summary for dental assistants*. Dentistry IQ. <https://www.dentistryiq.com/dental-assisting/career-enhancements/article/16366236/extraoral-panoramic-errors-a-summary-for-dental-assistants>
- Kaviani, F., Johari, M., & Esmaeili, F. (2008). Evaluation of common errors of panoramic radiographs in Tabriz Faculty of Dentistry [Text/html]. *Journal of Dental Research, Dental Clinics, Dental Prospects*; ISSN 2008210X. <https://doi.org/10.5681/JODDD.2008.021>
- Klein, J. S., Brant, W. E., Helms, C. A., & Vinson, E. N. (2019). Diagnostic imaging methods. In *Brant and Helm's fundamentals of diagnostic radiology*. Wolters Kluwer.
- Masthoff, M., Gerwing, M., Masthoff, M., Timme, M., Kleinheinz, J., Berninger, M., Heindel, W., Wildgruber, M., & Schülke, C. (2019). Dental Imaging – A basic guide for the radiologist. *RöFo - Fortschritte Auf Dem Gebiet Der Röntgenstrahlen Und Der Bildgebenden Verfahren*, 191(03), 192–198. <https://doi.org/10.1055/a-0636-4129>
- Meador, T., Dirlam, M., Guerrettaz, N., Wilson, T., Grammer, S., Miller, R., & Mercer, B. (n.d.). *Tissue Projection Errors*. Practical Panoramic Imaging. Retrieved 8 November 2022, from <https://www.dentalcare.com/en-us/ce-courses/ce589/tissue-projection-errors>
- Närhi, T. O., Leinonen, K., Wolf, J., & Ainamo, A. (2000). Longitudinal radiological study of the oral health parameters in an elderly Finnish population. *Acta Odontologica Scandinavica*, 58(3), 119–124. <https://doi.org/10.1080/000163500429244>
- Pauwels, R. (2020). *History of dental radiography: evolution of 2d and 3d imaging modalities*.
- Radiology (ACR), R. S. of N. A. (RSNA) and A. C. of. (2022, July 1). *Panoramic Dental X-ray*. Radiologyinfo.Org. <https://www.radiologyinfo.org/en/info/panoramic-xray>
- Rondon, R. H. N., Pereira, Y. C. L., & do Nascimento, G. C. (2014). Common positioning errors in panoramic radiography: A review. *Imaging Science in Dentistry*, 44(1), 1. <https://doi.org/10.5624/isd.2014.44.1.1>
- Subbulakshmi, Ac., Mohan, N., Thiruneervannan, R., Naveen, S., & Gokulraj, S. (2016). Positioning errors in digital panoramic radiographs: A study. *Journal of Orofacial Sciences*, 8(1), 22. <https://doi.org/10.4103/0975-8844.181922>
- Whaites, E., & Drage, N. (2013). The radiographic image. In *Essentials of dental radiography and radiology* (5th ed., p. 12). Churchill Livingstone Elsevier.
- Whaites, E., & Drage, N. (2021). Periapical radiography. In *Essentials of dental radiography and radiology* (Sixth edition, p. 282). Elsevier.
- White, S. C., & Pharoah, M. J. (2014). *Oral radiology: Principles and interpretation* (7th ed.). Elsevier.