

## POSTER 27

## Development of new odontometric method of sex estimation through lower canines in Portuguese and Mozambican populations

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## Resumo

**Introduction:** Sex determination is fundamental in establishing the biological profile and identification of individuals in different forensic contexts [1]. The main step in forensic identification is sex determination followed by ancestry, age, and height estimation. Socioeconomic indicators can also be relevant in this process. Forensic dentistry provides legal expertise by scientifically collecting, testing, and evaluating dental evidence. In forensic dentistry, individual identification is based on the traditional visual confrontation of ante- and post-mortem dental radiograph records [2]. Odontometric methods use the measurement of distances between certain landmarks that are commonly evaluated to distinguish between sexes [3]. Furthermore, new 3D technologies such as CBCT allow new measurements that were previously difficult to obtain [1]. The dental root also helps in comparative identification and population differentiation, and new 3D technologies such as CBCT allow to obtain three-dimensional data of root morphology [4, 5]. **Objectives:** The aim of this study is to develop an odontometric method for sex estimation based on mandibular canine roots dimensions and subsequent validation in a European (Portuguese) and African (Mozambican) population. **Material and Methods:** A total of 200 ideal digital panoramic radiographs (100 men and 100 women) of patients

aged 20 to 45 years, are expected to be carried out in a Portuguese and Mozambican population. The maximum mesiodistal and buccolingual dimension of the cervical root will be measured by orthopantomography and/or cone beam computed tomography images. The Bland-Altman method will be applied for reliability analysis to obtain a curve of receiver operating characteristics (ROC) for precision analysis. **Results:** Preliminary results in previous studies show that sex estimation using an odontometric method through the mandibular canine teeth was achieved, and overall, for both men and women the odontometric method was shown good results for sex identification, the results ranged from 70% to 80%. It is likely that, from these studies, the proportions of mandibular canines may be parameters of interest for sexual diagnosis, particularly cervical width. Based on these previous studies, it is intended to continue with diversified populations and increase the sample number. **Conclusions:** The teeth dimension can vary between different population groups as they have a different genetic background. Among all teeth, canines exhibit the greatest sexual dimorphism, and are known for their greater resistance to ante- and post-mortem trauma compared to other teeth. Thus, making it extremely valuable in sex determination and human identification.

**Keywords:** sex determination; mandibular canines roots; forensic dentistry; forensic radiology; ancestry.

## References:

- [1] Capitaneanu C, CAPITANEANU C, WILLEMS G, THEVISSSEN P. A systematic review of odontological sex estimation methods. *J Forensic Odontostomatol.* 35(2):1-19, 2017.
- [2] ADAMS C., CARABOTT R. and EVANS S. *Forensic Odontology: An essential guide.* Wiley Blackwell. 2014.
- [3] FRANCO SF, AZEVEDO Á, MATOS VM, PÉREZ-MONGIOVI D, TEIXEIRA A. Odontometric parameters in human mandibular molars for sex estimation in a forensic context. *Dental Anthropology Journal.* 34(2), 2021.
- [4] GOVINDARAM D, BHARANIDHARAN R, RAMYA R, RAMESHKUMAR A, PRIYADHARSINI N, RAJKUMAR K. Root Length: As a determinant tool of sexual dimorphism in an ethnic Tamil population. *J Forensic Dent Sci.* 10(2):96-100, 2018.
- [5] DE KONINCK, A, AZEVEDO A., CARDOSO, M., TEIXEIRA, T., PÉREZ-MONGIOVI, D. Bucco-lingual root dimension of permanent mandibular canines as a complementary estimator of sex: a pilot study. *Rev Port Estomatol Med Dent Cir Maxilofac.* 62 (4): 217-222, 2021.