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## G40 Identifying the Edentulous

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After attending this presentation, attendees will learn information regarding a new method of identifying the edentulous which may assist in victim identification.

This presentation will impact the forensic science community by introducing a new method of identification based upon the maxillary sinus configuration/morphology assessed from panoramic radiographs.

Identifying the edentulous is challenging in many respects. In part, the absence of teeth critically diminishes the use of thousands of dental reference points used in standard dental identification. The trabecular patterns in the edentulous may also be too few or unique to be used in the identification process.<sup>1,2</sup>

Results of a previous study suggest that radiographic identification of the edentulous has a high error rate and should be dual reported.<sup>3</sup> Forensic practitioners are well aware that dental prostheses should be labeled but, practically speaking, this recommendation is not generally accepted by the dental profession nor is it practiced. Moreover, many edentulous either do not have prostheses, do not wear them, or remove them at night. The present study seeks to produce a reliable source of reference for comparing Antemortem (AM) to Postmortem (PM) panoramic radiographs of the maxillary sinuses.

The technique provides a mathematical assessment for comparing the curves on the maxillary sinus floor and walls of an AM panoramic radiograph to a PM panoramic radiograph. The mathematical formula that will represent the sinus configuration will use strategic points on the sinus. Even the relatively amorphous sinus can be represented by a group of functions that define the different curves of the sinuses. Once the mathematical functions of both AM and PM curves are known using the method presented, and comparing the percentage of similarity of curves and concordant points on both curves, an identification can be established or refuted.

To test the present hypothesis, 50 pairs of panoramic dental radiographs (Orthopantomogram (OPG)) were collected. Each pair were taken at least five years apart using the same panoramic device. The initial OPG dental radiograph was assigned as the AM dental radiograph, and the other OPG dental radiograph taken at least five years later was assigned as the PM dental radiograph. The set of OPG dental radiographs of each patient was calculated and compared using the method presented that evaluates the correlation between AM and PM sinus formulas.

### References:

1. Desranleau S, Dorion RBJ. The trabecular bone in identification. *Proceedings of the American Academy of Forensic Sciences*, 63<sup>rd</sup> Annual Scientific Meeting, Chicago, IL. 2011.
2. Desranleau S, Dorion RBJ. The trabecular bone in identification — Part 2. *Proceedings of the American Academy of Forensic Sciences*, 64<sup>th</sup> Annual Scientific Meeting, Atlanta, GA. 2012.
3. Richmond R, Pretty IA. Identification of the edentulous individual: an investigation into the accuracy of radiographic identifications. *J. Forens. Sciences* 2011;55(4):984-987.

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### Forensic Odontology, Edentulous, Maxillary Sinuses