

## **Comparing CT scout and simulated radiographs on reliability of frontal sinus measurement**

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Uniqueness of frontal sinuses can be used as a distinguishing factor for post-mortem identification. Post-mortem studies must be reliably matched to previous antemortem imaging done on the individual, even if that imaging is from different machines. Thus, it is critical to be able to accurately relate CT scans and radiographs. To verify the repeatability of measuring the frontal sinus, dimensions between both imaging modalities and measurers were analyzed. In order to compare this, 3DSlicer was used to compile CT images from 15 individuals into simulated radiographs. Eight measurements were taken from these radiographs and compared to the measurements gathered from the scout images from each CT scan. A paired-t test was performed to compare intraobserver data, i.e., data collected by the same observer from the same images, interobserver data, i.e., data collected by two separate observers on the same images, and intermodality data, i.e., data collected by the same observer on images of the same individual in two different imaging modalities. Intraobserver data was not statistically different ( $p>0.05$ ). However, interobserver error showed differences between maximum breadth of the sinus ( $p=0.010$ ) and a measure of left sinus breadth ( $p=0.04$ ). Similarly, intermodality error showed a significant difference between maximum breadth ( $p=0.023$ ) and a measure of right sinus breadth ( $p<0.001$ ). These measurements likely differ because of a single outlier individual, but all other measurements were not significantly different. This shows reliability in certain measurements between imaging modalities, but there is a margin of error that may impact current post mortem identification.