

Introduction and objective

Forensic dentistry deals with examination, and evaluation of dental arches characteristics among other records. Forensic dentistry is pivotal for the identification of deceased individuals who cannot be identified by other means following, usually, a violent death, as in mass disasters or crimes. Intraoral 3D scanners including probe light sources that are configured to generate light that is transmitted towards the dental elements and a camera composed of an array of sensor creates images of the dental arches. In this work we scanned the dental arches of cadavers to make a comparison between a forensic dentist report obtained by typical physical method and by the 3D imaging method using a 3D scanner.

Methods

To create the three-dimensional image of the dental arch we used a 3Shape Trios scanner. The total time to scan and create each 3D model in dicom format was about 10 minutes. A Dental Surgeon and Criminal Expert at IML/SP was requested to make a legal dental report and the 5 dicom models were analysed by the dentist using 3shape 3DViewer.

Results and Conclusion

According to the evaluation of the forensic dentist comparing the legal dental report carried out in the 5 cases with the corresponding 3D scanned images, it is possible through the images analyses to determine features that can assist in the identification processes. The limitations point out by the forensic specialist are regarding the quality of the acquisition process. The 3D images can assist in the identification in cases of unknown and/or unclaimed bodies, where is possible to perform the reconstruction from the 3D digital scan, and send the obtained images to specialized centres for the necessary analyses, without the need to forward the remains, substantially minimizing the costs of transportation, packaging, chain of custody and preservation of human parts.



Top view of one dental arch



Back (above) and frontal view (below) of one dental arch

References:

<https://doi.org/10.1016/j.cegh.2018.05.006>
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