

Comparison between 2D and 3D facial images for forensic identification

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ABSTRACT

The three dimensional (3D) face scanning technology provides a realistic representation of the patient's face. Especially since it is non-invasive and non-ionizing, it is useful to further analyze maxillofacial deformities. Moreover, the 3D facial scanning technology have brought new opportunities for forensic identification. Indeed in forensic practice, the reliability of identification is dependent on the quality of the reference images and the frequencies.

The aim of this study is to comparatively assess and validate the accuracy of 3D and 2D facial imaging.

2D and 3D images of 50 subjects were collected. 2D photography were taken in the clinical setup with Nikon camera. 3D images were captured with two systems: ProMax 3D max (Planmeca) and 3D Vectra Hi (Canfield Scientific). The acquired 2D and 3D images were afterwards transferred to a computer for objective (quantitative) and subjective (qualitative) analysis.

After training and calibration, two observers should perform quantitative analysis identifying soft-tissue facial landmarks, including linear proportions and angular measurements. For qualitative analysis, a group of 10 observers should complete a questionnaire regarding facial characteristics on 2D and 3D images.

What we expect is to find a similar performance in 2D and 3D imaging regarding quantitative measures, but an improved qualitative scoring for 3D imaging. Besides, when comparing both 3D systems, the clinical Vectra 3D seems yielding superior results.