OC-092 - (23736) - QUANTIFICATION OF THE EFFECT OF GRAVITY ON OCULAR PROTRUSION.

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Ocular placement is pivotal for facial approximations. While gravity is known to affect soft tissue structures, its influence on ocular protrusion remains unclear. Most studies on ocular protrusion used cadavers and imaging modalities taken in supine position. This study's main objective was to quantify gravity's effect on ocular protrusion by using modalities taken in the upright position.

Following ethical approval (SMUREC/M/235/2024:PG), 199 scans of black South Africans: 105 computer tomography (CT) scans (51 females, 54 males) acquired in the supine position and 94 cone beam computer tomography (CBCT) scans (45 females, 49 males) acquired in the upright position, were retrospectively collected from a private health care facility in Pretoria. Five bilateral 3D landmarks were placed around the orbital rim and the anterior-most point of the cornea using MeVisLab v 3.0.2. Ocular protrusion was calculated from these landmarks, and statistical comparisons were made between CT and CBCT results for each sex group, using PAST statistical software.
Ocular protrusion, measured from the superior orbital margin, was significantly greater in the CBCT (upright) sample for both sexes (1.54 – 2.5 mm; $p < 0.001$) than in the CT (supine) sample. Males exhibited greater ocular protrusion from the medial and inferior orbital margins in CT scans (1.23 – 2.22 mm; $p < 0.010$) compared to CBCT scans, suggesting a shallower eye position in the supine position.

Our findings suggest that ocular protrusion is significantly affected by gravity and should be taken into account to potentially improve facial approximations for forensic identification.

Palavras-chave : Gravitational forces, Facial approximation, Ocular placement