European Association for Clinical Anatomy - British Association of Clinical Anatomists
Sociedad Anatomica Española

International Congress of Clinical Anatomy – June 24th / 27th, 2015
ROUEN – FRANCE
Submission to return before 3rd April 2015 to
contact@rouen-convention-bureau.com

Title :4D (3D+t) virtual dissection of the neck based on surface laser scanning: a new tool for Anatomy learning and Surgical training

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Abstract: (250 words)

Conventional cadaveric dissection is an essential tool for learning Surgical Anatomy before getting to safely operate living patients. However, the increasing number of Medicine students and the limited number of available cadavers led to a reduction of dissection practice. Recent publications have proposed to use three-dimensional (3D) laser scanning during the dissection to create digital 3D anatomical reconstructions. The reconstructions are usually performed at the end of the dissection, which does not allow the medical student to learn the dissection steps or to understand all the continuous in-depth connections between anatomical structures.

We present a first study to produce a dynamic 3D virtual dissection of the neck. We performed a bilateral neck dissection on a fresh cadaver, identifying 8 relevant anatomic planes for scanning. Each plane was scanned using a surface 3D laser scanner (Artec Spider™). This device has a geometrical accuracy up to 0.05 mm, and also acquires the color with high definition. As it does not require to place any markers, the scanning process is quick and can be easily integrated in a conventional dissection. After processing the acquisitions, the 8 resulting 3D color meshes were overlaid to create an accurate and thorough 4D (3D+time) environment.

4D virtual dissection can be used as a real interactive training tool for surgery residents by adding dissection tools, with the ability to repeat and record their gestures and assess their learning curve. It could be used as an evaluation of their surgical skills before getting to train on real cadavers.

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