UltraFest IX
Keynote Presentation

Speaker

Dr. Anne Agur (University of Toronto)

Anne Agur, BSc(OT), MSc, PhD, is a Professor in the Division of Anatomy, Department of Surgery at the University of Toronto, with cross appointments in the Division of Physical Medicine and Rehabilitation, Department of Medicine, and the Departments of Physical Therapy and Occupational Science and Occupational Therapy, Biomedical Communications, Institute of Medical Science, Rehabilitation Science Institute and Graduate Department of Dentistry. She has been a teacher and researcher in the Division of Anatomy for more than 40 years with a primary research interest in clinically applied normal vs pathological structure and function of the musculoskeletal system including joints, musculotendinous architecture, innervation patterns and pain-generating mechanisms. Anne has published widely with over 120 peer reviewed publications in basic science, biomechanics, modelling, clinical, and education journals. She has won numerous teaching and mentorship awards. Anne has authored Grant's Atlas of Anatomy for 7 editions, coauthored Essential Clinical Anatomy for 6 editions and Clinically Oriented Anatomy for 3 editions.

Abstract

3D reconstruction of vocal tract-related skeletal muscle: Dissection, digitization, and 3D modeling

The use of imaging to localize and characterize normal, anomalous and pathological anatomy has been ongoing since the inception of radiographic technology. MRI and CT, in conjunction with their growing number of specialized applications, provide the ability to reconstruct body systems in 3D using volume renderings. Skeletal muscle modelling has been challenging as the intramuscular volume consisting of the contractile and connective tissue elements (e.g. aponeuroses) cannot be reconstructed fully using current imaging techniques. However, by using dissection, digitization and 3D modelling, complete volumetric reconstruction at the fiber bundle level, as in situ, is possible. The technique requires meticulous dissection to ensure that all intramuscular components are translated into Cartesian coordinates upon digitization. This presentation will focus on how the digitization/3D modelling approach can be utilized to understand head and neck muscle morphology, interrelationships and functional differences, providing an evidence-based approach to developing novel clinical imaging assessment tools and high-fidelity simulations.