ASSL News

Newsletter of the Anatomical Society of Sri Lanka

October 2017 | ISSN 2536-86772 | VOLUME 1- ISSUE 4

COUNCIL OF THE ASSL 2016/17

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EDITORIAL

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Anatomy has one of the most fascinating histories, undoubtedly older than any written history we know. Like any other discipline, Anatomy is more interesting if we consider not just the current state of knowledge but how it compares to past understanding of the subject and how our current knowledge is gained. The field of Anatomy did not spring up overnight but built upon centuries of thought and controversy, triumph and defeat. The present state of Anatomy owes a great deal to the early anatomists who had the curiosity and the vision to look at Human form & function in new ways and the courage to question authority.

Vesalius, an ardent anatomist of the 16th century, who is also considered as the *Father of Modern Human Anatomy*, presented the most monumental of Anatomy texts ever, *De Humani Corporis Fabrica*. This marked the beginning of an era of precise anatomical knowledge dispelling thousands of myths, dogmas and superstitions to its present awe-inspiring splendor.

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The scope of modern Human Anatomy has become very wide. With the vast technological development, Human Anatomy is now studied with every possible means that have a potential to enlarge the boundaries of anatomical knowledge. Over the past decade, the discipline of Anatomy has undergone significant changes. Some of these changes are specific to the field of Anatomy while others reflect the evolution of the basic Biomedical Sciences. One of the most important trends we have observed is the intermingling of biomedical research, with scientists in many fields using very similar approaches in research. Along with this intermingling of biomedical research is a much greater homogenization of disciplines. This trend is reflected by an ever increasing disparity between what anatomists teach and what they do in their research! Because of this fact, present day anatomists may not have the traditions or loyalty to their discipline compared to their peers of previous eras. However, on the brighter side, they introduce an element of "*hybrid vigor*" that is essential for the evolution of the discipline.

The overall goal of Anatomy departments today is to function as vigorous academic and scholastic communities welcoming research and innovative thinking. An anatomist of today has to widen their outlook and learn broad problems of Human Biology in its various aspects. Anatomy is said to be the architecture of physiological functions and the foundation on which Surgery is built upon. It is the study of Human Biology rather than an Anatomy of the dead.

It is also imperative to remember that we humans are primates and part of both a living order and its ancestral process. However special as we are as humans, unlike Athena of ancient Greek lore, we did not spring fully grown from the brow of Zeus. Our evolution and inherent morphology was a process that spanned millions of years throughout our long and meandering path. Wondrous genetic insights and stunning fossil finds are continuing to add major pieces to the still-incomplete jigsaw puzzle of our evolutionary path. Yet to gain as complete a picture as can be gleaned, it is imperative to explore, as only through diligent research, that we gain a full picture of how our remarkable form came to be.

Human Anatomy, today, is at crossroads. Its increasing pre-occupation with molecular biology, genetics, biochemistry, electron microscopy, cytochemistry, histochemistry, developmental biology, biomedical imaging, forensic anthropology, comparative anatomy and experimental biology is well reflected in the research publications in the journals dedicated to Anatomy. The latest edition of Gray's Anatomy & Langman's Medical Embryology provides further proof of the diverse fields in which anatomists are engaged in.

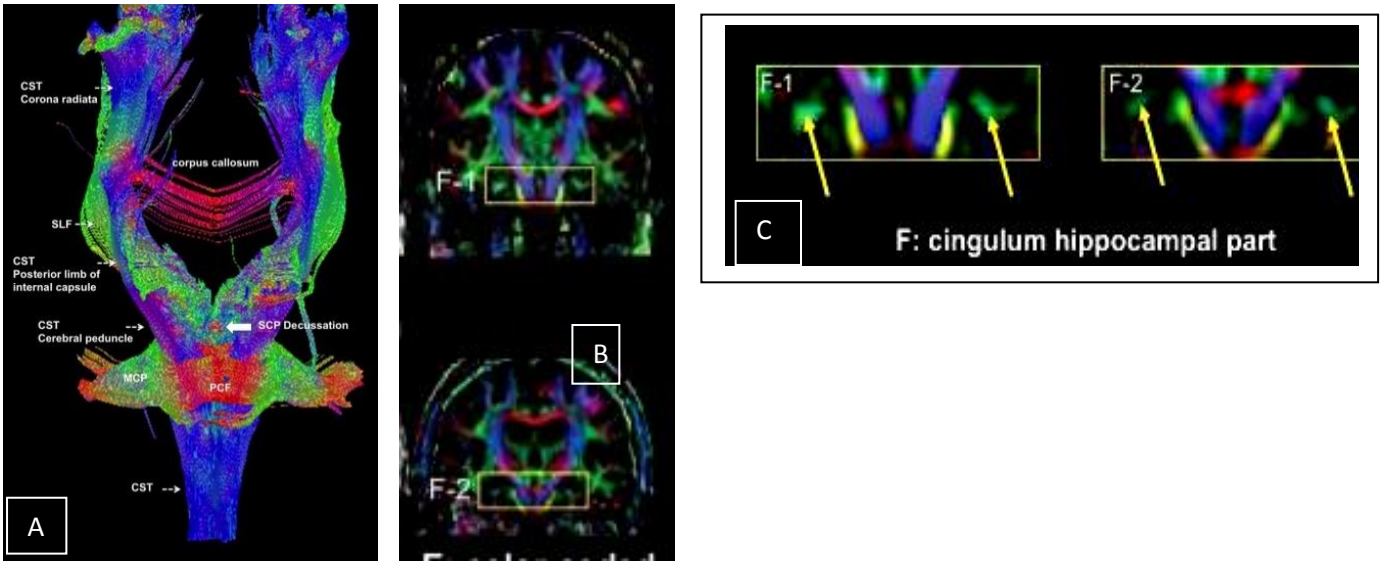
The contributions of the various branches of Anatomy to the principles and practice of Medicine are already most impressive. The future promises many exciting opportunities for scientific research in the field of Anatomy. Renaissance in Anatomy coincides with an intellectual awakening and re-appreciation of ancient wisdom. Young anatomists must be encouraged to think beyond the boundaries of traditional Anatomy, be innovative and to look beyond the narrow and restricted view to see the broader picture in greater depth to face the emerging challenges of the future.

INVITED ARTICLE - 1

New insight to white matter tracts of brain and spinal cord in the light of DTI

Ascending, descending and transverse white matter bundles of the brain and the spinal cord form structural and functional neuronal framework. White matter injury is a recognized cause of cognitive impairment following brain injury. Furthermore, white matter volume can be affected by various pathological conditions. Pre surgical evaluation and localization of white matter tracts (Eg: corticospinal tract) is imperative to avoid inadvertent injuries during neurosurgical interventions. However, freely available baseline imaging modalities are unable to cater the adequate sensitivity needed for precise localization of these vital structures, while underestimating the pathologies. Diffusion Tensor Imaging (DTI) Tractography is an emerging imaging modality that promises to fill this gap.

DTI is a form of magnetic resonant imaging (MRI) modality. Brownian motion of the water molecules seen in a magnetic field is utilized to form DTI images. The direction of molecular motion of water is restricted by the neuronal cell membrane, which is used to identify orientation of the neurons in the brain and the spinal cord. The tracts are labeled with a color code according to their orientation. For example, tracts are displayed in red when they are crossing from left to right, green color coding for antero-posterior direction, while blue for tracts extending from supero-inferior direction. Quantitative assessment of the white matter tracts is a great advantage of the technique. **Fiber tractography (FT)** is a 3D reconstruction technique used to assess neural tracts using data collected by DTI.



(A) DTI image of the brain showing normal decussation of superior cerebellar peduncle; (B) & (C) DTI of the brain (F-1) normal person comparing with a patient with (F-2) Alzheimer's disease (*Case courtesy: Dr. Charlie Chia-Tsong Hsu, Radiopaedia.org, rID: 45543).*

DTI images can be used to visualize motor & sensory pathways, language pathways, occipito-temporal visual network, dorsal-frontal-parietal networks, limbic pathways and corpus callosum, hence useful to localize pathological conditions related to mentioned tracts.

Enormous research field is visualized through this window called DTI, which ranges from anatomical localization to functional mapping.

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INVITED ARTICLE - 2

Resuscitation artefacts that mimics ante-mortem injuries

In the context of Forensic Medicine an artefact is defined as a spurious post-mortem/peri-mortem presentation which simulates an ante-mortem event. Differentiation of an ante-mortem lesion from peri-mortem and post-mortem lesions is a challenge to the forensic pathologist especially in autopsies where the judicial procedures are pending. The peri-mortem origin of these lesions leads to development of vital reactions which makes it extremely difficult to distinguish from the deliberately caused mechanical injuries. Out of the different types of post-mortem artefacts, resuscitation artifacts account for reckoning portion of lesions of peri-mortem or post-mortem origin usually caused by terminal therapeutic procedures of the medical staff.

Some of the common resuscitation artefacts are chest contusions and rib fractures due to chest compression, contusion of lips due to tracheal intubation, ring like bruises on the precordium due to defibrillation, redness and edema of laryngeal entrance due to intubation, haemorrhage into the myocardium due to intra-cardiac adrenalin injection.

During the chest compression which is an essential component of resuscitation, chest injuries such as rib and sternal fractures are commonly observed. Rib fractures are common on 3^{rd}, 4^{th} & 5^{th} ribs at the mid-clavicular line either unilaterally on the left side or bilateral. These rib fractures may lead to complications like haemothorax and pneumothorax. The displaced rib fractures may inflict lung contusion, anterior mediastinal and myocardial contusions and even penetrating injuries on the lungs and heart. The abdominal injuries are less frequent in resuscitation. However, liver laceration is seen due to its large, fragile state and its location in the right hypochondrial region close to the midline. The chest and abdominal injuries due to resuscitation may increase the severity of the main pathology and may even contribute to the death.

Linear abrasions caused by finger nails and contusions caused by finger tips on the neck which develop while trying to intubate the patient can raise suspicion regarding the pressure exerted on the neck, especially in manual strangulation. Intra cardiac injections may be accompanied by bruising of the heart and sometimes haemo-pericardium. Needle puncture marks especially on the extremities may confused with snake bite or self-induced punctures in intravenous drug abuse.

Forensic pathologist must be aware of the principles of emergency medicine to recognize these lesions and pathophysiology of its origination to prevent the diagnostic errors. It is important that all therapeutic devices be left on the bodies destined for inquest. Review of the medical records can be helpful in sorting out artefacts due to resuscitation and other therapeutic procedures.

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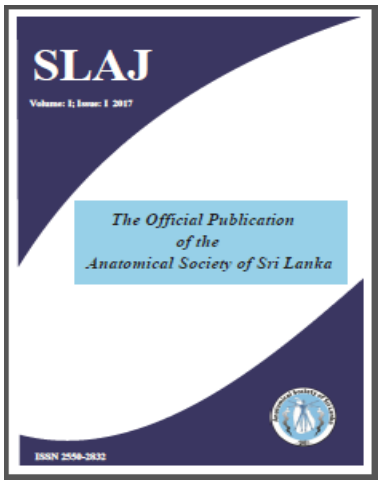
"The dead have never bothered me. It's the living that I fear."
Postmortem by Patricia Cornwell

Senior Professor B. G. Nanayakkara, President of the Anatomical Society of Sri Lanka, presenting the ASSL Newsletter to Professor Janaka De Silva, Director of the PGIM, Colombo. Professor Isurani Ilayperuma, Secretary/ASSL & Professor D. J. Anthony, Vice President/ASSL were also present on this occasion.

ASSL NEWS & EVENTS

- Inaugural issue of the Sri Lanka Anatomy Journal (SLAJ) was issued on 10. 08. 2017.
- Second issue of the Sri Lanka Anatomy Journal (SLAJ) will be issued on 10. 10.2017.



THANK YOU FROM *ASSL NEWS*…….

Since its inception in October 2016, *ASSL News* has enjoyed much support from authors and readers alike, eager to share the unique perspectives on the anatomical sciences. We are ending our publication with this 4th issue, in order to pave the way for the new committee.

Publication of *ASSL News* could not have been accomplished without the generous support and enthusiasm of many. On behalf of the Newsletter Committee, I would like to express our appreciation for all those who have contributed time and talent to *ASSL News* over the past eleven months. Many authors and experts have endeavored to fill each issue of the *ASSL News* with diverse and valuable articles thus placing their faith on us in a unique and proactive way. Please accept our heartfelt thanks for your efforts. With much gratitude we also warmly recognize the contribution of our Senior Advisors, Professor Rohan W. Jayasekara & Professor L. S. S. Salgado, who provided keen insight and advice to authors and editors alike.

Our most heartfelt thanks are extended to the President/ASSL, Professor B. G. Nanayakkara, for his vision and inspiration from the very beginning of this venture, shaping *ASSL News* into a truly unique scientific publication. His generous support, effective collaboration and the mediation of contacts has significantly contributed to the successful publication of this quarterly newsletter. A special word of appreciation is also extended to the Assistant Editor/ASSL, Dr. Iroshani Kodikara, whose persistence, hard work and dedication has significantly contributed to the timely publication of *ASSL News*. We have been exhaustively, yet happily, working round the clock on producing four issues of the newsletter & two issues of the journal. Nevertheless, I have come away from our experiences all the richer, with not only a deeper appreciation for the anatomical sciences, but also important academic friendships that I hope will last well into the future.

Professor Isurani Ilayperuma
Secretary/ASSL

ACKNOWLEDGEMENT

Computer assistance: Mr. Gayan Kodithuwakku, IT Unit, Faculty of Medicine, Galle.

ACADEMIC SESSIONS & AGM

It is highly dishonourable for a reasonable soul to reside in so divinely built a mansion as the body she resides in altogether unacquainted with the exquisite structure of it.

Robert Boyle - 17th Century Chemist