Supplement

Research abstracts presented at the Annual Academic Sessions 2023

Effectiveness of Thera-Band Exercise Program and Electro- physiotherapy on Abductor Strength of the Iliotibial Band in Athletes with Iliotibial Band Syndrome

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Introduction

The iliotibial band (ITB) is a thick fascial band formed near the hip by merging fascia of the gluteus maximus, gluteus medius, and tensor fasciae latae muscles. Iliotibial band syndrome (ITBS) is a common overuse injury, manifests as pain on the outer side of the knee and hip due to ITB friction with the femur. Athletes may experience reduced hip and knee mobility, potentially impacting performance. This study aims to compare the efficacy of two ITBS treatments: Thera-Band Exercise Program (TBEP) as the experimental group and Electro-Physiotherapy (EPT) as the control group.

Methods

A randomized controlled trial carried out at the Teaching Hospital Karapitiya, with thirty athletes in each group. The control group received EPT, and medications, for two weeks, the experimental group received TBEP and medications for the same duration. Abductor Muscle strength assessment was conducted on Day 01 and Day 28 using handheld dynamometer (HHD)

Results

The mean ages in the control and experimental groups were 24.33±6.40 years and 24.97±6.87 years, respectively. Muscle strength (N) for the control group on Day 1 and Day 28 were 99.77± 24.81 and 108.83±22.36, respectively. In the experimental group, the corresponding values were 102.50±26.71 and 147.00±29.92, respectively. The mean differences for muscle strength of two groups in D1 and D28 were 2.733(P>0.683) and 38.167(P<0.001) (RM-ANOVA). TBEP had a statistically significant effect (p=0.000), and it explained 16.8% of the variance in muscle strength. The Partial Eta Squared was 0.168.

Conclusions

The Thera band program works better in improving abductor muscle strength of the athletes with ITBS compared to electro- physiotherapy.

Myofascial Release as a Method of Treatment for Bicipital Tendinopathy in Patients attending Sports Medicine Clinic of Teaching Hospital Karapitiya

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Introduction and objectives
Bicipital tendinopathy causes shoulder pain and reduced range of motion (ROM). Analgesics and physiotherapy are used as treatments. Objective is to study the effectiveness of myofascial release for bicipital tendinopathy.

Methods
Sixty patients with anterior shoulder pain were randomly allocated to control and experimental groups. Control group received conventional physiotherapy (electrotherapy and exercise) for 10 days, while the experimental group received myofascial release (manually mobilizing, pressing stretching and rolling soft tissues). Pain scores and ROM were assessed using a visual analog scale and digital inclinometer, respectively on days 1, 5 and 10. On each day, measurements were obtained before and after intervention.

Results
Rest pain for control group on day 1, day 5 and day 10 (pre and post intervention) were 6.7 ± 0.29, 6.03 ± 0.29, 5.63 ± 0.29, 5.17 ± 0.24, 4.90 ± 0.26, 4.43 ± 0.27, respectively. Same parameters for the experimental group were 6.60 ± 0.35, 5.00 ± 0.39, 4.30 ± 0.30, 3.60 ± 0.26, 3.10 ± 0.26, 2.56 ± 0.25, respectively. Both interventions significantly reduced pain scores compared to the baseline. Notably, the experimental group demonstrated a greater reduction in pain score from day 1 to day 10 compared to the control group ($p<0.0001$, RM-ANOVA followed by Bonferroni *post-hoc* test). In the control group, the change in ROM (degrees - °) from the baseline for each session was $2.96°\pm0.97$, $3.66°\pm1.22$, $4.56°\pm1.27$, $4.43°\pm1.07$, and $5.20°\pm1.17$. In the experimental group, the corresponding values were $15.10°\pm5.37$, $16.43°\pm5.51$, $20.87°\pm6.66$, $22.67°\pm7.41$, and $23.33°\pm7.71$. The experimental group showed significantly greater improvement in ROM compared to the control group at each session ($p<0.001$, RM-ANOVA followed by Bonferroni *post-hoc* test).

Conclusions
Myofascial release works better than conventional physiotherapy for bicipital tendinopathy as it results in greater improvement of pain and ROM.

The Vagoaccessory Triangle: The Arena of ELITE

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Introduction and Objectives
Lesions anterior to the lower brainstem in the cerebello-medullary cistern can be accessed through far lateral approach and extreme lateral infra-jugular transcondylar exposure (ELITE). Detailed anatomical knowledge of this region is of paramount importance to the operating surgeon. Comprehensive anatomy of this microsurgical corridor is sparse. Our aim is to define the anatomy of this region with relevance to the surgical approach which would enable the surgeon to navigate this region with ease during surgery.

Materials and Methods
Cadaveric dissection was carried out with focus on the approach to various lesions even anterior to the lower brainstem through the far lateral approach and ELITE. Various anatomical structures in the region between the 9th to 12th cranial nerves were studied. The same was correlated with the Computerized Scan and Magnetic Resonance Brain Imaging findings and intraoperative findings of two cases of space occupying lesions in this region. The results of which are presented.

Discussion
Through the far lateral approach the vago-accessory triangle (VAT) and three sub triangles within it are exposed. Rootlets of the hypoglossal nerve divides the VAT into infra-hypoglossal, supra-hypoglossal and hypoglossal-hypoglossal sub triangles. The VAT contains three cisterns compartmentalized by three membranes, three nerves, and a fourth segment of vertebral artery (V4) with its three branches, in three sub-triangles.

Conclusion
Detailed knowledge of each anatomical structure and its relationship would enable the surgeon to operate safely in this region. Limitations of this surgical approach are also highlighted in this paper.

E-Cadherin and Vimentin Espression in Node Positive and Node Negative Invasive Carcinoma of Breast of No Special Type

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Introduction
Metastasis is the leading cause of death in breast cancer. Epithelial-mesenchymal transition-(EMT) is a phenotypic switching mechanism which enables epithelial cells to acquire a mesenchymal phenotype with enhanced capacity to migrate, thus is an accepted mechanism of metastasis. Epithelial E-cadherin and mesenchymal Vimentin can be used as cellular markers to identify the occurrence of EMT.

Objectives
To compare E-cadherin and vimentin expressions between node-positive and node-negative breast carcinoma-no special type-(IBC-NST).
To compare expressions between tumour-stromal interface-(TSI) and centre of tumour-(CT) in the node-positive tumours.

Methods
Eighty-four IBC-NST breast tumours were subjected to dual-immunohistochemical staining with anti-E cadherin and anti-vimentin antibodies. Any cytoplasmic staining for Vimentin and $\geq 70\%$ of membranous staining for E-cadherin were taken positive and cells were counted in 10 high power fields. Intensity of staining was graded high-3, moderate-2, low-1 and absent-0. Percentage of positive cells was multiplied by the intensity to obtain the immuno-score-(IS) for both protein expressions. IS were compared using t-tests.

Results
A lower E-cadherin($p=0.001$) and higher vimentin($p=0.008$) expression was seen in node-positive group than in node-negative group. Lower E-cadherin($p<0.001$) and higher vimentin($p<0.001$) expression was seen at TSI than at CT in LN-positive group.

Conclusions
A significant loss of epithelial properties and acquisition of mesenchymal properties in node-positive group is evident when compared to node-negative samples, strengthening the fact of EMT as a mechanism of metastasis. Further, significant loss of epithelial marker expression with significantly elevated mesenchymal marker expression were seen at TSI of node-positive sample indicating that TSI is the main site of EMT in IBC-NST.

Morphometry of Distal Femur and Proximal Tibia in a Sri Lankan Population: A Study using Dry Bones

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Introduction and Objectives
The data on morphometry of the distal femur and the proximal tibia are imperative in designing/selecting prosthesis for total knee replacement (TKR). Most of the commercially available TKR prosthesis are manufactured based on morphometric data from other ethnic groups especially Caucasians. Hence, this study aims to determine morphometry of distal femur and proximal tibia in Sri Lankan population.

Methods
The study was done conducted in August 2023, using preserved bones in the Department of Anatomy, Faculty of Medical Sciences, University of Sri Jayewardenepura, for teaching and research. A total of 36 femurs and 28 tibias were measured independently by two investigators using a sliding Vernier caliper. Each investigator measured the parameters thrice and the average was taken. Medial anteroposterior length (MAPL- maximum medio lateral length across the condyles in transverse plane), lateral anteroposterior length (LAPL- maximum anteroposterior length of the lateral condyle), medio lateral length (MLL – maximum anteroposterior length of the medial condyle) were measured from both distal femur and the tibia and the anteroposterior length (APL- maximum anteroposterior length of the proximal tibial surface) was measured only from the tibia. Mean and standard deviation were calculated for each parameter and compared with existing data from the published literature.

Results
For the femurs, MAPL was 52.56 mm [95% CI, 51.03-54.09], LAPL was 57.33 mm[95% CI, 55.83-58.84], MLL was 72.65mm [95% CI, 70.83-74.47] while the calculated AR was 1.27[95% CI, 1.25-1.28]. For tibia, MAPL was 42.02mm [95% CI, 40.51-43.53], LAPL was 37.72 mm[95% CI, 36.68-38.76], MLL was 67.14 mm[95% CI, 65.05-69.23], APL was 40.46 mm[95% CI, 39.08-41.84] and the AR was 1.66[95% CI, 1.62-1.71]. In a systematic review conducted in 2015, for Caucasian femurs, MAPL was 74.00 mm [95% CI, 70-77], LAPL was 62.00 mm [95% CI, 57-66], MLL was 74.00 mm [95% CI, 70-77] and AR was 1.20[95% CI, 1.11-1, 29]. For Caucasian tibias, MAPL was 50.00 mm [95% CI, 48-52], LAPL was 44.00mm [95% CI, 42-47], MLL was74.00mm [95% CI, 73-76], APL was 48.00mm [95% CI, 46-51] and AR was 1.55 mm [95% CI, 1.40-1.71].

Conclusion
The morphometry of the distal femoral and proximal tibial surfaces in Sri Lankan population differs from that of Caucasians, being markedly lesser in dimensions. This should be taken into consideration when selecting implants for Sri Lankans in TKR, to ensure the success of the procedure.

Precision Mapping of Anatomical Landmarks for Ankle Block Procedures

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Introduction and Objectives
This study aimed to identify and describe precise anatomical landmarks for accurately locating the five nerves involved in ankle block anaesthesia, a crucial procedure for foot surgeries.

Methods
We conducted a cross-sectional study using 24 cadaveric ankles. The study was approved by the institutional review board [EC/21/100]. Measurements were taken from cross-sectional photographs of the ankles, cut at a horizontal plane across the most prominent points of the medial and lateral malleoli. The curvilinear distance from the malleolar points to each of the five cutaneous nerves and their depth from the skin surface were recorded.

Results
We identified the following landmarks:
Tibial nerve: 8-10 mm deep to the skin, located posterolateral to the posterior tibial artery, 29-36 mm posterior to the most prominent point of the medial malleolus.
Deep peroneal nerve: 6-8 mm deep to the skin, situated between the tendons of the extensor hallucis longus and extensor digitorum longus.
Medial dorsal cutaneous nerve: 1.8-2.5 mm deep to the skin, found on the tendon of extensor digitorum longus, 68-79 mm from the most prominent point of the medial malleolus.
Sural nerve: 4-6 mm deep to the skin, located 25-30 mm posterior to the most prominent point of the lateral malleolus, midway between the lateral malleolus and the posterior border of the Achilles tendon.
Saphenous nerve: 2-2.8 cm anterior to the most prominent point of the medial malleolus.

Conclusion
This study provides easily identifiable, palpable bony and soft tissue landmarks for precise localization of the nerves for ankle blocks.

Surgically important Neurovascular Structures Related to the Submandibular Gland: A Cadaveric Study

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Introduction and Objectives
The pathologies and procedures of the submandibular gland are in numerous. Comprehensive knowledge of the anatomy and its relations of the submandibular gland will avoid iatrogenic injuries within the submandibular triangle. This study was aimed to assess surgical important anatomical relations of the Submandibular gland.

Methods
In twenty five cadavers (13 M/ 12 F) right and left side SMG (n=50) were dissected and observed. Data were recorded on frequency of facial artery, its relation to the capsule of the submandibular gland and the relation of submandibular gland to the marginal mandibular nerve of the facial nerve.

Results
The majority 40/50 had the facial artery placed on the posterior surface of the SMG outside the capsule of the gland. In 10/50 specimens' facial arteries were encapsulated by the SMG. Out of these ten, 2 had facial arteries piercing through the parenchyma of the SMG. All facial artery anomalies were found to be present unilaterally and majority were in the right side. It was observed that most of the anomalous facial arteries were found in females. All the specimens which the marginal mandibular nerve traversed through the superficial part of the SMG were females and found on the right side.

Conclusions
The data indicated a higher rate of anomalous facial artery and the marginal mandibular nerve in relation to the submandibular gland were on right side with a female preponderance.

Anatomical Relations of the Recurrent Laryngeal Nerve in Thyroid Dissections: A Cadaveric Study

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Introduction
One of the most serious side effects of thyroid surgery is recurrent laryngeal nerve (RLN) palsy. For RLN preservation, visualization of the anatomical relationships between the RLN and inferior thyroid artery (ITA) is very important. Other significant landmarks for a secure thyroidectomy are the inferior horn of the thyroid cartilage and the suspensory ligament of berry.
Objective of this study was to characterize the anatomical relationships of RLN to ITA and the suspensory ligament of berry during thyroid dissections.

Methods
A one-year observation cadaveric study was carried out from June 2022 to June 2023.Thirty-five cadavers with a total of 70 RLNs were dissected.

Results
 The majority of the RLNs in this series (20/35 and 24/35on right and left side respectively) had a retrovascular path, considering both ITA trunk and its branches. The RLN is posterolateral to the suspensory ligament of Berry in 64/70 of the dissected nerves, whereas the remaining 6 nerves ran between its fibres. On both sides, by travelling posteriorly to the inferior horn of the thyroid cartilage, all RLNs entered the larynx. There was no evidence of non-recurrent laryngeal nerve.

Conclusion
In our study, RLN mainly follow a retrovascular course on both right and left sides. In most cases RLN is posterolateral to the suspensory ligament of Berry.

PP 03

Comparison on Effectivity of Online vs Onsite Anatomy Teaching/Learning among Medical Undergraduates in a Sri Lankan Medical Faculty

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Introduction
Anatomy education involves on-site teaching with cadaveric dissections, prosected specimens, and histology practical sessions. Covid-19 pandemic mandated educational institutes including medical faculties to convert to online education. Objective of this study was to compare effectivity of online vs onsite anatomy education.

Method
We used Y1S2 exam marks (thorax-abdomen module) among three batches of first-year medical students (completely onsite learning before pandemic: batch A, transition to online learning mid-semester: batch B, completely online learning with two weeks of expedited onsite practical: batch C) of same university in Sri Lanka.
Mean marks obtained by batches A, B, C for components of multiple-choice questions (MCQ), short-answer questions (SAQ) and objective-structured practical exams (OSPE) including cadaver-based spots were compared using Kruskal-Wallis and Dwass-Steel-Critchlow-Fligner tests.

Results
Proportions of marks allocated for MCQ: SAQ: OSPE were 30:40:30. Mean MCQ marks of batches A, B, C were 14.8, 14.9, 16.4 respectively with significant difference ($H(2)=29.1$, $p=<0.001$), where batch C had better performance ($p=<0.001$). Mean SAQ marks were 24, 25.1, 24 respectively with significant difference ($H(2)=11.3$, $p=0.003$), where batch B had better performance than batch A ($p<0.001$). Mean OSPE marks were 24.8, 17.4, 20.7 respectively with a significant difference ($H(2)=334.8$, $p=<0.001$), where batch B had significantly lower performance than batch A and C(<0.001), while batch A had performed better than batch C (<0.001).

Conclusions
Considering OSPEs, best performance was seen among those with complete onsite learning while the batch who faced the transition period scored the least. MCQ performance was best among those who had mostly online learning.

Ethical Relevance and Adequacy of Information given in Body Donation forms Issued by Sri Lankan Medical and Dental Faculties

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Introduction and Objectives
Donated cadavers play a significant role in advancement of medical education and medical research. Obtaining informed written consent regarding the use of cadaver from donor or the next of kin is now a widely accepted ethical practice in receipt of such donations. Therefore, it is important to identify the deficiencies in the consenting process. The aim of this study was to evaluate the published body donation forms issued by Sri Lankan medical and dental faculties.

Methods
Body donation forms displayed in the faculty websites for the access of the public were assessed using a checklist which was created based on the "Best Practices Guide for Donation Programs," published by the American Association of Clinical Anatomists.

Results
Twelve body donation forms were reviewed. All had written documents that adhered to reasonable standards of readability, including pre-preparation methods (only embalming), possible causes to reject, registration procedure, documentary evidence to be submitted, facts regarding payments, transport, and donation acceptance time. 10 forms mention the age and competency status to be a donor. Only six forms mention the possibility of refusal due to a lack of space. Facts regarding the possibility of transfer and use outside of the faculty have been mentioned only in two forms. Only one form mentions the end of use, such as the preparation of the skeleton, and another one describes the disposition of remains after use. Acquisition and use of images for videoing, displaying, potting, and plastination have not been mentioned in any of the forms.

Conclusion
The procedure of obtaining informed consent through body donation forms in all the faculties were covering most of the ethical aspects. However, an update needs to be done with the inclusion of information regarding disposition of remains, acquisition of imaging, displaying, potting, and plastination.

Evaluation of the Use of Scenario-based, Single-best-answer Multiple Choice Questions in the Assessment of Anatomy in a Medical Faculty in Sri Lanka

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Introduction

Scenario-based, single-best-answer multiple-choice questions (SBA-MCQs) offer several advantages over true-false type MCQs (T/F-MCQs) in Anatomy assessment by promoting higher-order thinking, clinical reasoning, and contextual learning. This study evaluated the use of SBA-MCQs in Anatomy assessment.

Methods

SBA-MCQs on anatomy of abdomen, gastrointestinal and urinary systems were developed in consultation with experts in Anatomy, Surgery and Medical Education. Formative assessment using 15 SBA-MCQs was done on the date of continuous assessment-2 (CA2) comprising 13 T/F-MCQs and 2 structured essay questions (SEQs) on the same content areas. SBA-MCQs were analyzed for difficulty index (DIF-I), discrimination index (DI), and distractor efficiency (DE). Correlation analysis of SBA-MCQ marks with T/F-MCQ and SEQ marks was done. Written comments/feedback were obtained immediately after the assessment.

Results

Two hundred first-year students were assessed. Thirteen SBA-MCQs had a DIF-I between 0.20-0.80 and 14 had DI>0.20. One question had a DIF-I of 0.83 and DI of 0.15 and another had a DIF-I of 0.19. Non-functional distractors were identified in 4 questions (DE<100%). Mean scores of SBA-MCQs, T/F-MCQs and SEQs were 54.5($\pm$15.7), 54.1($\pm$12.3) and 65.2($\pm$10.8) respectively. There was a statistically significant correlation (P<0.001) of SBA-MCQ marks with T/F-MCQ (r=0.39) and SEQ marks (r=0.36). Among 197 feedback notes, common positive comments regarding SBA-MCQs were "higher clinical application/relevance" (71), "easier than T/F-MCQs" (41), "no negative marks" (21), "interesting" (12) and "less stressful" (12). Common negative comments were "questions are too long" (41) and "more difficult than T/F-MCQs" (26). Twenty-five students suggested a combination of SBA-MCQs and T/F-MCQs in Anatomy assessment.

Conclusion

The study showed the usefulness of SBA-MCQs for a more comprehensive and authentic assessment of anatomical knowledge.

siDAP: A Novel Stress-induced Proteing Disaggregase Assembly Pathway

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Introduction and Objectives
Proteostasis, the fundamental process that upholds proper protein function and equilibrium, is paramount in warding off ageing and disease. Disruption of proteostasis, characterized by protein aggregation, triggers cellular dysfunction through various toxic mechanisms. Multicellular organisms depend on protein disaggregases to counteract these perilous aggregates. Nevertheless, the intricacies of regulating these disaggregases in stress-recovering human cells have remained enigmatic. Our study aimed to elucidate the principal stress-induced disaggregase, thus facilitating the solubilization of aggregated proteins.

Methods
Leveraging a state-of-the-art *in-situ* protein-protein interaction detection assay, we meticulously tracked the assembly-disassembly dynamics of a unique stress-induced protein disaggregase in human cells. Furthermore, we dissected the regulatory mechanisms governing the assembly of this pathway and its capacity to dissolve disease-associated amyloid aggregates.

Results
Our investigation unveiled a novel stress-induced protein disaggregase assembly pathway, termed siDAP, orchestrating the expeditious dissolution of protein aggregates during cellular stress recovery. Significantly, our findings highlight siDAP's remarkable ability to enhance the solubilization of disease-associated amyloids, holding immense promise for proteostasis-related disease therapeutics. Crucially, our study elucidates the pathway's vulnerability to early cellular ageing, shedding light on the gradual decline of cellular fitness during the ageing process.

Conclusion
Our pioneering study introduces the novel stress-induced protein disaggregation pathway, siDAP. This breakthrough underscores how siDAP plays a pivotal role in mediating the resolution of protein aggregates, thus laying a solid foundation for the development of targeted therapies and interventions aimed at bolstering proteostasis maintenance in ageing populations.

Efficacy of Indocyanine Green Fluorescence in the Anatomical Mapping of the Biliary Tree during Laparoscopic Cholecystectomy in a Sri Lankan Patient Cohort

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Introduction and objectives

Indocyanine Green (ICG) fluorescence imaging aids in real-time, non-invasive intraoperative mapping of the biliary tree anatomy, during laparoscopic cholecystectomy (LC). Here, we demonstrate the efficacy of ICG in visualizing the biliary tree in a cohort of patients from Sri Lanka.

Method

This prospective cohort study enrolled 121 consecutive patients who underwent LC. 5mg of ICG was intravenously injected 30 minutes prior to anesthetizing. The visualization of specific anatomical landmarks was recorded pre and post Calot's triangle dissection, using a Stryker 1588 laparoscope under visible light and near Infrared.

Result

Of 121 patients (84-Biliary colic, 25-Acute cholecystitis, 2-Chronic cholecystitis, 4-GB polyp, 5-CBD stones, 1-Adenomyosis), visualization of the biliary tree was significantly improved after administration of ICG (p=<0.001) both before dissection (BD) (95%CI= 91.7% [85.3%-96.0%]) and after dissection (AD) (95% CI=71.1% [62.1%-79.0%]).

The cystic duct- common bile duct junction was visualized in 0% vs. 50% BD in acute vs. chronic cholecystitis and was increased to 80% vs. 100% (P<0.001) with ICG. The AD rate of this landmark saw a 2-fold increase with fluorescence (P<0.001) in both groups. The CBD visualization had a 2.5-fold increase in BD (P< 0.001) and a 1.6-fold increase in AD (P<0.001) with ICG. The hepatic ducts were only visualized with ICG.

Conclusions

In this cohort, the use of ICG during LC has been shown to significantly improve the identification of biliary landmarks. Its routine use in LC may be considered to prevent bile duct injury by facilitating a better understanding of the anatomy.

Trifurcation of Left Coronary Artery found during routine dissections at Faculty of Medicine, University of Peradeniya: A Cadaveric Case Report

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Introduction

Coronary circulation comprises of right coronary artery (RCA) and left coronary artery (LCA). Understanding their variations is pivotal for procedures such as coronary angiography and bypass graft surgeries. Most variations in coronary artery anatomy are neither symptomatic nor coexist with other congenital abnormalities of the heart, mostly recognized during angiograms or autopsies. Available literature shows that variations of coronary circulation may lead to difficulties in catheterization with a higher risk of complications. The main aim of the study was to identify variations in coronary circulation in cadavers routinely dissected by medical students at University of Peradeniya.

Methods

Sixteen heart specimens from adult cadavers were evaluated for coronary circulation and observed for the origin of coronary ostia, main branches of RCA and LCA and the presence of variations.

Results

The origin of RCA was the anterior aortic sinus and the origin of LCA was the left posterior aortic sinus in all sixteen cadavers. Fifteen were right dominant while one cadaver was left dominant with trifurcation of LCA.

Conclusion

A case of trifurcation of LCA was detected during the routine dissection of cadavers. This variation with the additional middle branch known as the 'ramus intermedius' is considered to reduce the effect on the heart in case of left coronary branch occlusion. However, it is also known to cause difficulties during interventional procedures of the LCA as well as lead to complications. Awareness of such variations will provide useful in minimizing complications in the diagnosis and management of coronary artery disease.

Morphology and Morphometry of the Human Acetabulum: A Study using Dry Hip Bones of a Sri Lankan Population

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Introduction and objectives
Morphology and morphometry of the hip acetabulum play a key role in selecting prosthesis for hip replacements as anterior cup overlap or prosthetic loosening may lead to hip failure. The available prosthetic devices are made in relation to Caucasian measurements. This study aims to measure the morphometry of the hip acetabulum and morphological features of the acetabular articular surface, which can be used to determine the appropriate-sized implants for Sri Lankans.

Methods
The study was conducted in August 2023 at the Department of Anatomy, Faculty of Medical Sciences, University of Sri Jayewardenepura. A total of 32 (18 right-sided and 14 left-sided) human adult dry hip bones of unknown age and sex, preserved at the department were used in the study. Five morphometric parameters such as vertical diameter (VD), transverse diameter (TD), anteroposterior diameter (APD), depth of acetabulum, and width of acetabular notch (NW) were measured thrice using a sliding vernier caliper by two investigators and the average was taken. The mean diameter (MD) was calculated for the 3 average diameters. Morphological assessments such as ridge shape and end of lunate surfaces were taken by observation, and surface area (SA), and volume of the acetabulum (V) were calculated using standard formulas for SA and V of a dome.

Results
In the present study, morphometric values and mean ± standard deviation (SD) were as follows: VD is 48.33±3.46mm, TD is 46.84±3.19mm, APD is 45.9±3.07mm, MD is 47.02±3.14mm, depth is 23.88±1.84mm and NW is 24.16±2.95mm. Morphology assessment shows SA as 3543.25mm^2 ± 431.49, and volume as 28147.15mm^3 ± 5035.63. Anterior acetabular ridge was curved in 31.3%, straight in 15.6%, angular in 31.3%, and irregular in 21.9% of bones. When considering lunate surfaces anterior end was curved in 56.3% and pointed in 43.8%. The posterior end was curved in 31 bones (96.9%) and one was pointed (3.1%). In a study in Turkey, conducted in 2022, VD is 52.22±3.82mm, APD is 51.49±3.81mm and Depth is 26.04±2.79mm which are statistically higher than the present findings and NW is 18.66±2.47mm which is statistically lower. In a study conducted in 2020 for Indian acetabulum, VD is 48.21±3.31mm, TD is 47.81±3.37mm, APD is 48.79±4.08mm, MD is 48.27±3.80mm, depth is 27.45±3.02mm which is statistically higher than current study values and NW is 23.58±2.77mm which is statistically lower. Morphology assessment shows SA as 4162.56±755.58mm2, and volume as 36,563.65±9408.67mm3, which are statistically higher than our findings. The majority of the anterior acetabular ridges were curved (45.7%), while our results show curved and angular with the same percentages, and most of the lunate surfaces were curved complying with our findings; but anterior less (54.3%), posterior with a higher percentage (100%).

Conclusion
This study shows a markedly lower dimensions of the acetabular measurements in a Sri Lankan population compared to Caucasian standards. This finding is imperative in selecting/manufacturing appropriate hip prostheses for Sri Lankan population.

Relevance and application of Anatomy knowledge in clinical training and practice: Perceptions of the final year medical students and recent medical graduates of the Rajarata University of Sri Lanka

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Introduction

Anatomy has a strong contribution to the knowledge required for clinical reasoning and decision-making. Contents of Anatomy curriculum should reflect the relevance and applicability to medical practice to prepare students for their future careers. This study assessed perceptions of final-year students and recent graduates of Rajarata medical faculty regarding application and relevance of Anatomy knowledge in clinical training and practice.

Methods

A descriptive cross-sectional study was conducted using an online questionnaire.

Results

A total of 211; final-year students (52.1%), pre-interns and intern medical officers (47.9%) responded, 63.5% being females. Perceived retention of Anatomy knowledge was 51% (5.1±1.7/10), and 57% and 40% in Physiology and Biochemistry respectively. Anatomy knowledge was perceived as fundamental for clinical training/practice by majority (89.1%); for clinical diagnosis (89.6%) and management (83.9%). Respondents had mixed opinions on relevance of teaching detailed anatomy (agreed-37.9%, disagreed-46.4%) and focusing only on clinically relevant anatomy (agreed-42.7%, disagreed-36.5%). Perceived relevance was highest for neuroanatomy, anatomy of abdomen, pelvis, and radiological anatomy. Histology, embryology and genetics were considered little or not relevant to clinical training/practice by 58.8%, 49.3% and 41.7% respectively. Anatomy knowledge was most useful in clinical training in general surgery (96.7%), obstetrics and gynaecology, neurosurgery, orthopedic surgery and radiology (91.9% each). Majority expressed the need to revisit important content (82.0%) and re-assess Anatomy (53.5%) during the clinical phase of MBBS program.

Conclusion

The study allowed recognition of content areas with different levels of perceived clinical relevance, and necessary curriculum amendments in Anatomy. The findings highlight the need for revisiting Anatomy during clinical teaching and training.

The Diameter of the Common Bile Duct: A Study on Autopsies

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Introduction
Common bile duct (CBD) is formed near porta hepatis by union of cystic duct (CD) with common hepatic duct (CHD). Its diameter is around 6 mm in adults, (< 8 mm) and tends to increase with age. Diameter of the normal CBD is important in detecting dilatation, during autopsies. Objective of this study was to establish the range of diameter of CBD in autopsies in a Sri Lankan population.

Methods
Extrahepatic biliary tract of deceased bodies subjected to medicolegal autopsies without known hepatobiliary disease at Department of Forensic Medicine, Faculty of Medicine, Peradeniya from June 2023 to September 2023 were dissected. CBD diameter was measured and recorded at its proximal end (commencement at the union of CD and CHD) and distal end (point of insertion to the pancreatic duct) using a calibrated digital vernier caliper. Descriptive analysis and independent sample T-test were used.

Results
Thirteen bodies (54% female) were studied. Mean age was 57.8 years (range 23-86). Mean diameter of proximal end was 4.01 mm (SD=0.679) while it was 3.02 mm (SD=0.778) at distal end. Overall mean was 3.52 mm (SD=0.875) with a range of 1.93 mm to 5.8 mm and all subjects had readings less than 6 mm. There is no statistically significant difference in CBD diameter in males and females (proximal end $p = 0.905$, distal end $p = 0.310$).

Conclusions
Average CBD diameter in a Sri Lankan adult is 3.52 mm with an upper limit of 5.8 mm. No statistically significant difference detected between the sexes.

Automated Image Segmentation for Cytomorphometric Analysis of Cajal-like Cells using FIJI

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Introduction and Objectives
Accurate cytomorphometric analysis often relies on unbiased image segmentation techniques. Here, we aimed to develop an automated algorithm for precise morphometric assessment of Cajal-like cells (CLCs), pivotal in generating peristaltic contractions at the ureteropelvic junction (UPJ).

Methods
The study was approved by the institutional review board [EC/19/014]. Immunohistochemistry employing αCD117, a cytosolic marker of CLCs, was utilized to stain 32 UPJ samples comprising 16 patients with UPJ obstruction and 16 matched controls. Images were acquired and processed using Fiji software for morphometric evaluation. The CD117-stained channel underwent a sequence of filters, followed by Gaussian blur to enhance cell segmentation. Subsequently, thresholding functions were applied. The output facilitated quantification of CLCs per image, along with descriptors for shape (Feret's diameter [the maximum distance between any two points along the cell membrane], solidity [a measure of the total concavity of the cell], perimeter [total length of the cell membrane] and circularity [a measure of how closely the cell resembles a perfect circle]) and distribution descriptors (distance from the centre of mass).

Results
The automated algorithm, employing image thresholding, yielded accurately segmented results, enabling swift and precise morphometric assessment. Notably, distinctive cytomorphometric signatures (increased Feret's diameter, solidity, and perimeter; Mann-Whitney U test, $p<.05$) and distributional patterns (clustering) in CLCs associated with UPJ obstruction in children were discerned using this technique.

Conclusion
Our findings demonstrate that Fiji-based automated segmentation algorithms offer unbiased and accurate morphometric quantification. This approach holds great potential for applications in anatomy and cell-biology research necessitating rigorous morphometric analysis.

A Preliminary Cadaveric Study on Variations of the Arterial Supply of Vermiform Appendix in a Sri Lankan Population

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Introduction and Objectives
Appendectomy is indicated for cases of appendicitis and appendicular neoplasms. Profound knowledge of the anatomical variations in the appendicular blood supply is important in reducing intraoperative and postoperative complications associated with the appendectomy procedure. This study aimed to determine the variations in the arterial supply of the vermiform appendix in a Sri Lankan population.

Methodology
In this preliminary descriptive observational study conducted in August 2023, ten adult human cadavers donated for teaching and research purposes to the Department of Anatomy were carefully dissected and observed in situ for the attachment of mesoappendix, appendicular artery, associated vascular patterns including accessory arteries and their origins.

Results
It was observed that the mesoappendix originated from the posterior layer of the mesentery of the terminal ileum in all cadavers. In seven (70%;7/10) the mesoappendix extended up to the tip of the appendix but in three (30%;3/10) the attachment was limited to the proximal 2⁄3 of the appendix. In eight (80%;8/10) cadavers the main appendicular artery arose from the inferior division of the ileocolic artery, while one cadaver exhibited an origin from the superior division and another from the trunk of the ileocolic artery. Accessory appendicular arteries were noted in three (30%;3/10) cadavers, with two arising from the posterior caecal artery and one from a common trunk giving off the main appendicular artery, accessory appendicular artery, and posterior caecal artery.

Conclusion
The study reveals that the arterial supply of the vermiform appendix exhibits individual variations. To establish population percentages for these anatomical differences, a larger cadaveric study is required.