

Third Anatomy Annual Congress in Rwanda - October 13, 2024

SOCIETY OF CLINICAL ANATOMY OF RWANDA (S-CAR)

Theme: Anatomy in the digital age: Embracing innovations and diversity

Dear guests, colleagues, students, and friends of S-CAR, I welcome you to our 3rd annual anatomy congress in Rwanda, themed “**Anatomy in the digital Age: Embracing innovation and diversity.**” It is important to note that significant digital transformations have marked the field of anatomy education. While 18th and 19th-century teaching anatomy relied solely on human dissection, today’s advancements include digital resources like 3D models, virtual dissection applications, online atlases, flipped classrooms, and hybrid learning models. These innovations address the critical challenge of human donor availability, the cost of the human donors’ program, and ethical and cultural challenges.

In Rwanda, where information technology is one of the transformative tools for development, technology in teaching facilitates interactive learning that enhances students’ comprehension and retention of anatomical concepts while preparing them for technology-driven medical practice.

Diversity remains a challenge in 21st-century anatomy education. Creating textbooks and digital resources representing African anatomical variations is crucial in promoting cultural understanding. At the University of Rwanda’s gross anatomy laboratory, diverse anatomical variations can lead to a better understanding of the African anatomical model. Using diverse anatomical models can inspire students to pursue careers in anatomy.

Diversity among teaching staff is also another way of motivating gender participation in anatomy education in Rwanda. To encourage gender participation at the grassroots, we have introduced an award for the best female abstract in the S-CAR 2024 competition.

The 3rd Anatomy Annual Congress program offers an interesting package for both professionals and students, with 51 presentations subdivided into six sessions. I believe this congress will help us appreciate the beauty of the anatomy sciences and how we can all embrace the innovations and diversity in this transformative digital age.

Lastly, on behalf of S-CAR, I would like to express my gratitude to our sponsors (UR, AUCA-ASOME, Operation Smile, and MMI) who have allowed this congress to happen.

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A1 - Demystifying the Concept of Body Donation in Zambia

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ABSTRACT

INTRODUCTION: To "demystify" means to clarify and remove the complexities or myths associated with a concept. "Donation" is the voluntary act of giving something, while "body donation" refers to the process of willingly donating one's body after death for medical research, education, or scientific purposes. Although body donation is crucial for medical advancements, it remains underutilized and misunderstood in Zambia due to cultural, religious, and legal factors. This article aims to demystify the concept of body donation in Zambia, which is the exploration of misconceptions, cultural beliefs, and legal frameworks surrounding body donation for medical research and education in Zambia.

METHODS: A quantitative cross-sectional descriptive design was used to target first- and second-year medical students currently taking anatomy courses as part of their medical studies. The sample size, consisting of 500 students, was determined using RaoSoft software (http://www.raosoft.com/sample_size.html) for sample size calculation. Simple random sampling techniques were utilized to ensure unbiased representation, which granted an equal opportunity for every member of the population selected. Data collection was executed through the utilization of a standardized questionnaire, which was divided into four distinct sections: socio-demographic, student perception, challenges, and possible solutions. The questionnaire encompassed closed-ended questions that were evaluated using a 5-point Likert scale within the perception and challenges sections, while open-ended questions were included to allow participants to provide potential solutions.

RESULTS: There was a significant relationship between students' knowledge about body donation and their attitude towards it, as well as a significant relationship between students' perceptions of body donation, differences in the knowledge, perception, and attitude towards body donation among students of different academic disciplines.

CONCLUSION: Zambian traditions and religious beliefs often regard the body as sacred, creating resistance to donation. However, greater awareness and education can foster broader acceptance.

A2 - Socio-cultural barriers influencing body donation among students at the University of Rwanda

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ABSTRACT

INTRODUCTION: Body donation is influenced by a multitude of factors in Africa. Globally, the scarcity of donations available for medical education and research is a constant challenge impacting the training of healthcare professionals. This study aimed to assess the socio-cultural barriers that affect body donation among students in Rwanda.

METHODS: A cross-sectional study involving 120 students at the Huye campus of the University of Rwanda. Data was collected using a Google format questionnaire. Perception was calculated by treating each entity under the perception item over the total number of respondents.

RESULTS: Most respondents were males (65.8%), while females made up 34.2%. The majority were within 18-24 years of age (94.2%). A majority of the respondents were medicine students (37.5%), pharmacy students (20%), nursing students (1.7%), and students who did not attend medical programs (40.8%). The majority of the respondents (74.2%) reported that education/research is a major factor that may influence their decision to donate their body. Some of the respondents (21.7%) reported that societal/cultural beliefs are factors to consider in the event they want to donate their body, while 9.2% reported that religious belief is a factor to consider when deciding about body donation. Concerning reasons why they will not donate their body, 38.3% of the respondents cited cultural/societal beliefs regarding respect for the death, 25% gave no reason why they are unwilling to donate, 23.3% cited health concerns, 18.3% cited religious beliefs, and 13.3% cited fear of disfigurement as their reason for being unwilling to donate their bodies after death.

CONCLUSION: To enhance body donation practices in Rwanda, it is critical to improve research and educational initiatives in this area. Emphasizing a grassroots approach will facilitate better understanding and acceptance of body donation within communities, religious institutions, and families.

A3 - Expression of vascular endothelial growth factor (VEGF) mRNA, VEGF receptor 2 (Flk-1) mRNA, and VEGF co-receptor neuropilin (Nrp)-1 mRNA in brain tissue of aging Tg2576 mice by in situ hybridization

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ABSTRACT

INTRODUCTION: Vascular endothelial growth factor (VEGF) has been characterized as a heparin-binding angiogenic growth factor displaying high specificity for endothelial cells. It is profoundly accumulated and co-localized with amyloid plaques in the brain of Alzheimer's disease patients.

METHOD: To examine the effect of amyloid plaques on the expression level of VEGF mRNA and its receptors, the brain tissue of both transgenic Tg2576 and wild-type mice at ages ranging from 13 to 22 months was subjected to in situ hybridization followed by densitometric assessment using computer-assisted image analysis.

RESULTS: Strong expression of VEGF mRNA, fetal liver kinase (Flk)-1 mRNA, and neuropilin (Nrp)-1 mRNA in the piriform, entorhinal, somatosensory, frontal cortex, and hippocampal formation of both transgenic and non-transgenic mice brains was detected. Developmentally, only the expression of VEGF mRNA increased with age in the entorhinal and somatosensory cortex of wild-type mice. In 20-month-old transgenic Tg2576 mice, upregulation of VEGF mRNA, Flk-1 mRNA, and Nrp-1 mRNA transcripts was observed in the entorhinal cortex compared to age-matched wild-type mice.

CONCLUSION: Our data suggest up-regulation of VEGF mRNA, Flk-1 mRNA, and Nrp-1 mRNA, at least in the entorhinal cortex, at ages when amyloid deposition in Tg2576 is typically increasing.

A4 - Innovative neuroanatomy education and its clinical impact: A prospective cohort study on peripheral nerve surgery outcomes at King Faisal Hospital-Rwanda.

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ABSTRACT

INTRODUCTION: This study explores the impact of innovative neuroanatomy education on the outcomes of peripheral nerve surgeries at King Faisal Hospital (KFH), Rwanda. Our focus is on the application of cadaveric anatomical dissection and Anatomage technology to improve surgical precision and patient outcomes.

METHODS: This ongoing prospective cohort study evaluates patients undergoing peripheral nerve surgery at KFH. Cases are monitored with follow-ups on Day 3, Day 30, Day 90, 6 months, and 12 months post-surgery. Neurophysiological assessments, including NCS/EMG, are performed at 1 month, 3 months, 6 months, and 12 months. The study includes five cases with various peripheral nerve injuries: Cases of brachial plexus avulsion, ulnar nerve repair with sural nerve graft, and neurotization procedures.

RESULTS: Case 1 involved a 40-year-old male with a brachial plexus injury who underwent DREZ-otomy for pain management, followed by Neurotization of the Musculocutaneous Nerve with 3rd and 4th Intercostal Nerve Transfers 1 year and 4 months post-trauma, showing reduced pain post-DREZ-otomy but persistent motor deficits. Case 2 featured a 52-year-old male with traumatic ulnar nerve injury and Median nerve entrapment between the 2 heads of pronator teres, who had significantly improved motor function post-forearm Surgical Exploration, median nerve neurolysis, and Ulnar Nerve Repair with Sural Nerve Graft. Case 3 was a 30-year-old male with brachial plexus avulsion, treated with Neurotization of the Spinal Accessory Nerve to the Suprascapular Nerve and Oberlin technique, demonstrating partial recovery of motor functions. Case 4, a 31-year-old male with a supraclavicular brachial plexus schwannoma, achieved gross total resection with preserved motor, sensory and neurophysiological functions. Case 5 features a 63-year-old male who came with intractable right upper limb pain not responding to medical management, post 8 years of having total brachial plexus injury due to RTA. He benefited from C5-T1 DREZotomy for his pain management.

CONCLUSIONS: Innovative neuroanatomy education utilizing cadaver dissection and Anatomage technology significantly enhances surgical planning and execution.

A5 - Promoting neuroscience research and education in limited-resource settings: Neuroscience-in-view at the University of Rwanda.

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ABSTRACT

INTRODUCTION: Neuroscience as a career is being shunned by most undergraduate and postgraduate students in Rwanda for various reasons, ranging from low awareness, inadequate infrastructure and curricula, lack of funding, and lack of clear job opportunities.

METHODS: A Google feedback form was used to collect data from 25 participants at the end of a one-day neuroscience training workshop held at the Histopathology laboratory of the School of Medicine and Health Sciences, Huye campus, University of Rwanda. The workshop consisted of both lectures and engaging hands-on activities involving the use of experimental animals. Five guinea pigs were obtained with permission from the National Industrial Research and Development Agency (NIRDA) Huye branch. The participants were trained on various routes of animal drug administration, animal euthanasia, animal dissection, animal brain harvesting, and fixation.

RESULTS: the participants were males (80%) and females (20%). Their level of study was undergraduate (80%), postgraduate (16%), and researchers (4%). 84% of the participants strongly agreed that they were satisfied with the content of the workshop. 84% of the participants strongly agree that the workshop helped them to understand the importance of experimental animal research. 64% of the participants strongly agree that the workshop helped them to understand the basics of animal handling, brain dissection, and brain harvesting. 56% of the participants strongly agree that the workshop stimulated their interest in neuroscience and basic science. 48% of the participants strongly agree that routine hematoxylin and eosin staining allows for visualization of the neuronal cell nuclei.

CONCLUSION: The study revealed that a majority of the participants are interested in neuroscience as a career path, but the challenges of inadequate infrastructure, limited funding, and lack of training on cutting-edge technologies may be a barrier to the actualization of the dreams of these young neuroscientists at the University of Rwanda.

A6 - Curcumin ameliorates cortical histomorphological deficits in streptozocin and the Western diet-induced neurodegeneration in Wistar rats.

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ABSTRACT

INTRODUCTION: We employed a rodent model to typify histomorphological changes connected to dementia-like symptoms and co-morbid insulin resistance; we examined cortical neuronal density and morphological changes; evaluated amyloid (A β) deposits and probed the association between phosphatidylinositol 3 kinase (PI3K), serine/threonine Protein kinase (AKT) and glycogen synthase kinase 3 β (GSK3 β) activity and oral curcumin regimen.

METHODS: 36 adult Wistar rats were randomized into six groups (n=6), control group rats received 1ml olive oil; the curcumin group received 200mg/kg BW curcumin; the diabetic model received HFD for 60 days, then three doses of 40mg/kg BW of streptozotocin (STZ); protective group were administered HFD, three doses of 40mg/kg BW of STZ and a concurrent treatment with 200mg/kg BW curcumin within 60 days; The preventive group rats received a pretreatment of 200mg/kg BW of curcumin, HFD for 60 days and three doses of 40mg/kg BW of STZ; the therapeutic group rats were administered HFD, three doses of 40mg/kg BW of STZ within 60 days, followed by 200mg/kg BW of curcumin for 21 days; Cortical sections were stained for microscopic investigations. ELISA was used for quantifying PI3K, AKT, and GSK3 β activity. Data was analyzed using one-way ANOVA and Turkey's post hoc test. p<0.05 was considered significant.

RESULTS: Findings indicate that insulin resistance was associated with cortical cyto-architectural deficits, while curcumin ameliorated observed deficits. Oral curcumin reduced cortical A β deposits and corrected impaired PI3K, AKT and GSK-3 β activities in the studied models.

CONCLUSION: Curcumin showed its ameliorative potential by up-regulating PI3K and AKT activity and inhibiting GSK-3 β .

A7 - Enhancing surgical skills through dissection courses: Residents' experience

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ABSTRACT

INTRODUCTION: Surgical anatomy dissection courses positively impact surgical knowledge and skills acquisition and are still considered a valuable source of learning anatomy. There are limited research studies on this topic in Rwanda, and most existing research papers emphasize the perception of learning anatomy, the history of anatomy, and the role of cadaveric dissection. This study aims to assess the correlation between cadaver anatomy dissection skills and the ability to implement practical skills with high self-confidence among residents.

METHODS: With the use of qualitative methodology, we conducted in-depth interviews with residents who participated in the dissection courses by assessing their self-perceived surgical capabilities, confidence levels, and overall experiences post-course.

RESULTS: Preliminary information revealed that involvement in dissection courses significantly improved residents' surgical skills, anatomy knowledge and confidence. Henceforth, residents highly valued direct interaction with anatomical structures, which facilitated deeper learning and retention of surgical anatomy concepts.

CONCLUSION: Timely incorporation of surgical anatomy dissection courses into the curriculum can be a cornerstone for enhancing the technical skills of future surgeons. Detailed research studies are recommended to explore the long-term impact on the surgical performance of surgeons who undertook the aforementioned surgical anatomy dissection course and related patient outcomes.

A8 - Impacts of Anthocyanins Fractionate of Maize Seed Extract on Reproductive Profile of Male Experimental Models Administered with Anthocyanins Fractionate of Maize Seed

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ABSTRACT

INTRODUCTION: This research was conducted to assess the impacts of anthocyanins fractionated from maize seeds extract on the histo-architecture of some reproductive organs, such as the testis, epididymis, and the prostate gland of adult Wistar rats.

METHODS: Twenty Wistar rats were randomly redistributed into three control groups (animals received water and hybrid growers food only), low dose (animals received food, water, and anthocyanins fractionate of maize seed at a dose of 1.0mg/kgBw), and high (animals received food, water, and anthocyanins fractionate of maize seed at a dose of 3.0mg/kgBw) respectively. At the end of the three-week experimental period, animals were sacrificed, and the organs were removed and processed histologically.

RESULTS: Results showed a morphological observable significant ($P < 0.05$) increase in the final mean body weight when compared with the initial body weight and control. Histological results revealed no cellular effects in the low-dose treated groups, while high-dose treated groups showed degenerative effects on the respective organs.

CONCLUSION: This study suggests that consuming extract at high doses and during work may negatively impact the functionalities of the assessed male organs, which could affect their fertility profile.

A9 - Effects of non-steroidal anti-inflammatory drug "Naproxen" on Cadmium-induced testicular injury in adult Wistar rats

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ABSTRACT

INTRODUCTION: Cadmium (Cd) is a heavy metal and a significant environmental toxicant. The general population is primarily exposed to Cd through contaminants in drinking water and food. Occupational exposure to Cd commonly occurs in industries such as mining and manufacturing, particularly in the production of batteries and pigments that utilize Cd. Additionally, industrial activities like smelting, metal refining, and municipal waste incineration release Cd into the atmosphere in the form of cadmium oxide, chloride, or sulfide. Previous studies have demonstrated that Cd can cause profound and irreversible damage to mammalian testes. In this study, Naproxen, a non-steroidal anti-inflammatory drug (NSAID), was evaluated for its potential protective effects against Cd-induced testicular injury.

METHODS: A total of 35 adult Wistar rats were used, divided into seven groups of five animals each. All groups, except the control, received 5 mg/kg body weight of Cd in their drinking water; Naproxen was administered by oral gavage. The study assessed the effects of Naproxen on Cd-induced testicular injury using various testicular biometric parameters, including sperm analysis, C-reactive protein (CRP) assay, superoxide dismutase (SOD) activity, and histological examinations.

RESULTS: Cd administration significantly altered testicular biometric parameters and histoarchitecture. However, Naproxen did not exhibit any significant ameliorative effects on Cd-induced testicular damage.

CONCLUSION: These findings suggest that despite its known anti-inflammatory properties, Naproxen may not be effective in mitigating testicular damage caused by cadmium toxicity. Further research is warranted to explore alternative therapeutic agents or combination therapies that may offer better protection against cadmium-induced reproductive toxicity.

A10 - Bone Preparation methods used in anatomy education at the University of Rwanda

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ABSTRACT

INTRODUCTION: Anatomy is a foundation of medical science, and it focuses on understanding the structure of the different parts of the human body in relation to its functions. One such structure includes the human bone, the basis of the human skeletal system. In addition, bones also assist in understanding the sites of soft tissue insertion and the course of neurovascular bundles. Different techniques are used in bone preparation, including insect consumption, cold or warm water maceration, burying, and natural maceration.

METHODS: The natural maceration method was used, where the human donors that have been dissected for medical educational purposes were buried at the maceration site of the Department of Human Anatomy in the School of Medicine and Pharmacy, Huye campus, University of Rwanda. The Specimens were buried at a depth of 1m. A net was placed under the specimens to avoid any bone loss. Then, an indicator was also placed over specimens to prevent bone damage during exhumation. The specimens were buried for two years, and then exhumed after the expiration of the burial period. The bone preparation techniques employed in the study include bone cleaning, bone bleaching, degreasing, drying, painting, and labeling.

RESULTS: 668 bones were prepared, which consisted of 11 skulls, 7 isolated mandibles, 30 isolated teeth, 11 scapulae, 18 clavicles, 14 humerus, 16 Radius, 16 ulna, 14 carpal bones, 139 vertebrae, 171 ribs, 3 Hyoid, 7 Sternum, 8 hips, 5 sacrum, 14 femur, 8 tibia, 8 fibula, 15 patella, 15 tarsal bones, 148 metatarsals, metacarpals and phalanges.

CONCLUSION: The natural maceration method is a cost-effective method of bone preparation for anatomy education, although it has the challenge of being time-consuming

A11 - Anatomical sciences beyond bones and muscles

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ABSTRACT

Anatomy is the study of the structure of living organisms, focusing on understanding how the body is built and organized. It ranges from examining the macroscopic structures like muscles and bones, to the microscopic details of cells and tissues. Often described as the blueprint of life, anatomy reveals the intricate designs and connections that allow our bodies to function seamlessly. However, this noble discipline has been relegated to the background due to a lack of sufficient information. Beyond its essential role in medicine and healthcare, anatomy plays a crucial part in fields such as biomedical engineering, where it informs the design of prosthetics, medical equipment, and instruments. Its critical role in radiography is to enable precise imaging and diagnosis through an understanding of internal body structures.

In sports, anatomical knowledge enhances athlete performance, prevents injuries, and supports tailored training, while neuroanatomy provides the key to understanding the complex organization of the nervous system, which is essential for accurate diagnosis and targeted treatment of neurological conditions. In anthropology, anatomy offers a window into human evolution and diversity, as well as ergonomics and forensics. Also, this discipline is key in aesthetics and cosmetology, where understanding the body's structure informs safe and effective cosmetic treatments. This comprehensive view underscores anatomy's relevance, extending far beyond muscles and bones, influencing areas from sports to beauty and medicine.

Anatomical sciences, far surpassing the study of muscles and bones, underpin advancements in biomedical engineering, radiography, sports anatomy, neuroanatomy, anthropology, and aesthetics and cosmetology. These disciplines enhance medical technology, precision in diagnostics, athletic performance, understanding of the brain, insights into human evolution, and improvements in physical appearance, collectively demonstrating the vast and impactful scope of anatomical knowledge

A12 - Impact of the anatomage table on anatomy learning among medical students at the University of Rwanda

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ABSTRACT

INTRODUCTION: The Anatomage table is a valuable tool for enhancing anatomy education for medical and allied health students at the College of Medicine and Health Sciences at the University of Rwanda. This study aims to assess its impact on anatomy learning among medical students.

METHODS: A cross-sectional study involving 118 first-year medical students at the Huye campus of the University of Rwanda. A Google format questionnaire was shared with the students after being taught the content of the Human Anatomy II (thorax, abdomen, pelvis, and perineum) module for a period of 2 months. Data was analyzed using Microsoft Excel version 2023.

RESULTS: The participants were males (61%) and females (38.1%). A majority of the participants were between the ages of 20 and 23 years old (87.3%), were from general medicine (83.1%), and the remaining were from dental surgery (16.9%). A majority of the participants (49.2%) agreed that they were fully satisfied with using the anatomage table as a learning method. Most participants (60.2%) strongly agree that the anatomage table helped them understand the topic better. A majority of the participants (62.7%) strongly agree that they developed a deeper understanding of the topic with a combination of anatomage-table and dissection. A majority of the participants (63.2%) strongly agree that the anatomage table helped them understand the body's different parts. Most participants (48.3%) strongly agree that the anatomage table helped them visualize the relative sizes of different parts. Most participants (56.8%) strongly agree that the anatomage table helped them understand the relationships between different parts of the body.

CONCLUSION: The findings of this study indicate that the Anatomage Table plays a significant role in enhancing anatomy instruction at the University of Rwanda.

A13 - Morphometry of the trigeminal ganglion, mandibular nerve, and foramen ovale, in Rwandan donors

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ABSTRACT

INTRODUCTION: The trigeminal nerve, the fifth cranial nerve, controls head and neck stimulation. It has three divisions: ophthalmic, maxillary, and mandibular. Variations in the trigeminal ganglia, foramen ovale, and mandibular division can affect clinical outcomes.

METHODS: This study conducted a topographical analysis of the trigeminal ganglion and foramen ovale using four human donors at the University of Rwanda. Measurements of length and width were taken with a ruler and documented with a digital camera. The study also identified the shapes of these structures during dissection, following guidelines from the Sarland Grant dissector handbook. Abnormal branching patterns of the inferior alveolar and lingual nerves were noted, and data were analyzed in Microsoft Excel.

RESULTS: Trigeminal ganglion is 2mm in width and 2.5 mm in length, in size and rounded shape. The most common shape of the foramen ovale was found to be oval. Oval-shaped foramen ovale was present on the right side and left side of three specimens, while the other was almond-shaped. Mean lengths of 4.62mm (right side) and 4.72 mm (left side) and widths of 2.78 mm (right side) and 2.89mm (left side) were observed and there was a communicating branch between the left inferior alveolar and lingual nerve at the trunk among 50% of the specimen have been used.

CONCLUSION: The studies found that TG's shape was rounded, FO shapes were oval and almond, and a mandibular nerve distribution variant was observed in 50% of donors with lingual and inferior alveolar nerve communication.

A14 - Anatomical study of phrenic nerve origin patterns among human donors: Pilot Study

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ABSTRACT

INTRODUCTION: The phrenic nerve (PN) originates from the anterior rami of the C3-C5 spinal nerves, with C4 being the predominant contributor. It is a crucial nerve that innervates the diaphragm, hence playing a vital role in respiration, and also provides sensory innervation to the fibrous pericardium and mediastinal parietal pleura. There have been reported cases of PN variation in its roots, course, and as an accessory to the phrenic. However, the PN pattern has not been studied in Rwanda.

METHODS: Four formalin-fixed human donors were dissected bilaterally. In a supine position, a transverse incision is made from the mental protuberance to the lateral aspect of the mastoid process. A longitudinal incision was used to reflect the skin and the platysma muscle bilaterally. Sternocleidomastoid muscles were reflected in the mastoid processes. The neck visceral organs and carotid sheath contents were all removed. Prevertebral muscles were removed, followed by corpectomy from C3-7. Dura mater was incised longitudinally, and rootlets and roots contributing to PN formation were identified.

RESULTS: Eight phrenic nerves were observed out of four human donors dissected bilaterally. The PN origins showed different patterns. 25%(N=2) of the 8 PN originated from only C3, and 50% (N=4) came from C4 and C5, and one of them gives an anastomotic branch to the dorsal scapular nerve. 25%(N=2) originated from C4 only. However, one gave an anastomotic branch to a branch from C5 and formed a trunk that rejoined the C5.

CONCLUSION: The findings of this study show that the Rwandan population exhibits variations in the phrenic nerve (PN), which raises curiosity about further dissections to explore various origin patterns beyond the normal anatomy of the PN. The clinical implications of this study include the potential for challenging clinical presentations and surgical procedures in patients with pathologies around the usual origins of the PN at C3, C4, and C5.

A15 - Medical students' perceptions of virtual anatomy dissection: A survey.

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ABSTRACT

INTRODUCTION: The limited availability of cadavers, the high costs associated with getting and preserving them, the high ratio of students to the number of cadavers, the anxiety experienced by students in the dissection room, and the difficulty in identifying some structures on cadavers are some challenges that anatomy education faces in sub-Saharan Africa. This has demanded a search for alternative methods of teaching anatomy, such as using virtual dissection tools. Virtual dissection tools enhance students' interest in anatomy, and the complementary use of the virtual dissection alongside cadaveric dissection is preferable to being used alone (Memudu et al., 2022). This study presents the thoughts of medical students on virtual dissection.

METHODS: This was a cross-sectional questionnaire-based study involving second-year, third-year, and fourth-year medical students in the Adventist School of Medicine of East-central Africa (ASOME), University of Rwanda (UR), and University of Global Health Equity (UGHE) who used virtual dissection tools (Anatomage or Sectra dissection table) alongside cadaveric dissection. The sample size was 248 students.

RESULTS: The return rate was 90.73%. 56% of respondents had used Anatomage, 18.2% had used the Sectra table, and 22.2% had utilized both tools. Additionally, 87.6 % of the students opined that cadaveric dissection and virtual dissection should be used together. Preference in using virtual dissection in different anatomy fields varies; 78.7% preferred gross anatomy, 9.8 % neuroanatomy, and 3.1% histology. Furthermore, 82.7% of students reported that virtual dissection increased their interest in learning anatomy, and 87.1% found that virtual dissection enhanced their understanding of the locations and relationships of different anatomical body structures. Finally, 91.1 % mention that virtual dissection should be encouraged in teaching and learning anatomy.

CONCLUSION: The respondents found that virtual dissection increased their interest in learning and should be encouraged in anatomy education. However, further research is recommended to assess more evidence besides students' perceptions.

A16 - Bridging the gender gap in anatomy teaching at the University of Rwanda

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ABSTRACT

INTRODUCTION: Anatomy is a fundamental science for medical education and medical practices. It is one subject perceived as being 'hard', 'difficult', or 'challenging' by some medical students. This may be due to the mode of delivery of the content in the classroom, which makes it challenging for the students to digest. Some anatomical topics, such as the female reproductive system, border on sensitive areas that may be best explained by a female teacher. Additionally, some studies have reported that female students are more inclined to discuss freely or ask questions when a female teacher is handling such sensitive topics; other studies have countered this narrative. The University of Rwanda, the only government-owned university in the country, has no female staff on the anatomy teaching team. This is worrisome, considering the drive by the government of Rwanda to boost gender inclusivity.

METHODS: This was an observational study where the researcher obtained data from the academic profile of the anatomy teaching team displayed at the Department of Human Anatomy, School of Medicine and Pharmacy, Huye campus, University of Rwanda.

RESULTS: The data showed that the anatomy department has a 24-teaching staff team composed of one professor, two associate professors, four senior lecturers, nine lecturers, two assistant lecturers, and six laboratory technologists. The entire team at the Department of Human Anatomy was composed of males, and there was no female on the team. Between 2022 and 2024, the department had a shortage of 5 members who left and assumed other roles within and outside Rwanda.

CONCLUSION: The lack of a female staff member may demotivate female participation in anatomy teaching at the University of Rwanda. Increasing the visibility of female role models in anatomical sciences could inspire more females to take up responsibilities in anatomy education at the University of Rwanda.

A17 - Anatomical variation of the Superior Mesenteric Artery branching pattern: Case series

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ABSTRACT

INTRODUCTION: Variations in several branches and branching patterns in the superior mesenteric artery are commonly observed and associated with clinical significance. Normally, the Superior Mesenteric Artery (SMA) is one of the three ventral branches of the abdominal aorta that gives the blood supply to the midgut. It gives 15-18 branches to the second part of the duodenum up to the right two-thirds of the transverse colon. However, the SMA may present variations in a number of branches and branching patterns.

CASE PRESENTATION: The cases of anatomical variations of the MA branching pattern were found during the routine educational dissection courses in the anatomy laboratory of the University of Rwanda. The dissection method was done following the Grant dissector handbook of Sauerland. The first case displayed the SMA with the middle colic artery and ileal branches, but its right colic artery and ileocecal artery were branching out of the common trunk (Colo-ileocolic trunk). In addition, the anterior and posterior cecal arteries originate directly from the SMA. In this case, the SMA did not give the inferior pancreatic-duodenal artery, and only seven branches were observed. The second and third cases displayed eight and ten branches, respectively. The number of jejunal and ileal branches varied between 4-5 and 1-2 in the second and third cases, respectively.

CONCLUSION: Three cases of anatomical variations of the SMA branching pattern demonstrate the interest in dissection as a tool to master anatomy beyond a textbook. Surgeons should be aware of these variations while planning resection or other surgical procedures on the midgut.

A18 - Renal artery variation in a tri-lobulated kidney: A case report

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ABSTRACT

INTRODUCTION: The anatomical variations of renal arteries are common in the general population and vary in how they are arranged. These variations are classified into two groups: extra-renal arteries, which are further divided into aberrant and hilar accessory renal arteries, and polar arteries when the kidney receives blood flow directly from the abdominal aorta to the poles instead of giving segmental arteries through the hilar.

CASE PRESENTATION: This case was found during a routine educational dissection at the anatomy laboratory of the University of Rwanda; following the instructions from the grant dissector handbook of Sauerland, we saw a human donor with a tri-lobulated right kidney receiving blood supply from two different renal arteries. Each renal artery originated from the abdominal aorta, passing posterior to the inferior vena cava and supplying the superior and inferior poles independently.

CONCLUSION: The renal artery variations are clinically important, and being aware of these variations helps to prevent intraoperative complications and enhances the safety of the patients undergoing partial nephrectomy, renal transplantation or donor of kidney, and other surgical procedures of the kidney.

A19 - Horseshoe kidney in a young adult male patient with an incarcerated umbilical hernia: Case report

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ABSTRACT

INTRODUCTION: The most common renal fusion anomaly is the horseshoe kidney, where two renal masses mainly fuse at the lower pole. It is usually asymptomatic and found incidentally during abdominopelvic imaging for other purposes. This case presentation reports a young man who consulted for an incarcerated umbilical hernia and was incidentally found to have an asymptomatic horseshoe kidney.

CASE PRESENTATION: It is an 18-year-old male patient who consulted the general surgery outpatient department in a tertiary teaching hospital in south Rwanda for clinical features of an incarcerated umbilical hernia and, during his paraclinical investigations, was found to have incidental asymptomatic horseshoe kidney at L3 without other associated anatomical anomalies. A diagnosis of incarcerated umbilical hernia with a horseshoe kidney was made. He underwent umbilical hernia repair, and 4 weeks later, came for a follow-up and healed. He was reassured of his horseshoe kidney.

CONCLUSION: Though usually asymptomatic, whenever symptomatic, a horseshoe kidney is associated with lethal conditions. Horseshoe kidney should be considered among the differential diagnoses for patients with abdominal pain and mass. Once the surgery is considered, preoperative imaging should be performed to assess the blood supply to the horseshoe kidney and possible associated aberrant anatomy to minimize the surgical hazards that may result from its aberrant anatomy.

A20 - Left ectopic umbilical kidney in a patient with amebiasis: Case report

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ABSTRACT

INTRODUCTION: Ectopic kidneys are rare, with a 1:12,000 clinical incidence and a 1:900 postmortem case rate, suggesting that this mostly asymptomatic aberration is clinically benign. The left side is more inclined than the right in this regard. Renal ectopia-related anomalies are well-known and typically affect the musculoskeletal, cardiovascular, and genitourinary systems.

CASE PRESENTATION: A 32-year-old woman consulted in the regular surgical outpatient department for a 3-year history of periumbilical abdominal pain. During her clinical and paraclinical investigations, she was diagnosed with amebiasis with incidental left umbilical ectopic kidney. She received treatment for amebiasis and fully recovered, while she was reassured of her left ectopic kidney.

CONCLUSION: For the safety of surgeons and patients, it is crucial to conduct thorough preoperative studies for patients with abdominal discomfort to rule out aberrant anatomy like an ectopic kidney, which would be challenging to think about among differential diagnoses of intra-abdominal masses.

A21 - Partial situs inversus in a patient with an obstructed left inguinal hernia: A case report

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ABSTRACT

INTRODUCTION: Situs solitus is the normal anatomical arrangement of abdominal and thoracic organs, contrary to situs inversus, which is the mirror image of this normal asymmetrical anatomical arrangement resulting from embryonic malrotation of the abdominal and thoracic viscera or a reverse left-right side determination during gastrulation.

CASE PRESENTATION: A 28-year-old male patient presented to the Accident and Emergency Department of the University Teaching Hospital of Butare for four days with signs and symptoms consistent with complete small bowel obstruction. He underwent explorative laparotomy and was found to have an obstructed, incarcerated left inguinal hernia with all intra-abdominal organs in inverted locations. Reduction of the small bowel was done, and hernia repair was done using an abdominal approach. The patient came four weeks later for a follow-up and was healthy and healed.

CONCLUSION: Consideration should be given to situs inversus status, even though it is uncommon when left upper or lower quadrant pain mimics acute appendicitis or cholecystitis.

A22 - High Origin of Radial Artery: A Case Report

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ABSTRACT

INTRODUCTION: The high origin of the radial artery is the most common arterial variation in the upper limb, which could either be a branch from the third part of the axillary or brachial arteries.

CASE PRESENTATION: During the routine gross dissection classes in the anatomy department of the Adventist School of Medicine of East Central Africa, we noticed a high origin of the radial artery. The variation was unilateral in a 35-year-old male cadaver. Rodríguez-Niedenführ et al. termed the high origin of radial artery as “brachioradial artery”. The radial artery was seen running between the lateral and medial roots of the median nerve in the axilla.

CONCLUSION: Knowledge of such variation is necessary as the radial artery is often used in vascular and reconstructive surgery (as in coronary bypass grafts), puncture, and cannulation. Also, the radial artery running between the roots of the median nerve is of clinical importance as the pulsations of the opposing artery could result in eliciting pain along the sensory distribution of the nerve.

A23 - Assessment of nutrition knowledge, attitudes, and practices for cardiovascular disease prevention among attendees of Remera Health Center

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ABSTRACT

INTRODUCTION: Cardiovascular diseases (CVDs) represent a significant global health burden, particularly in low- and middle-income countries. This study aimed to assess the levels of knowledge, attitudes, and practices regarding nutrition for CVD prevention among attendees of Remera Health Center (HC) in the Gasabo district.

METHODS: A cross-sectional study was conducted, employing face-to-face interviews for data collection. Variables, including knowledge, attitudes, and practices, were analyzed using SPSS, and results were presented using tables and graphs. Study participants were selected through random sampling methods.

RESULTS: The study revealed that 52.3% of participants had a moderate level of knowledge, 22.8% had a low level, and 24.9% exhibited a high level of knowledge regarding nutrition and CVD prevention. Moreover, 95.4% of participants demonstrated positive attitudes, with 4.1% holding neutral attitudes and only 0.5% expressing negative attitudes. However, concerning practices, 65.5% of participants exhibited poor nutrition-related practices, while 32.5% displayed moderate practices, and only 2% demonstrated good practices.

CONCLUSION: The findings suggest that while most participants possess a high level of knowledge and positive attitudes toward nutrition for CVD prevention, there is a significant gap in translating this knowledge into practice. Efforts to improve nutritional practices among attendees of Remera Health Center are warranted to effectively mitigate the risk of CVDs in the community.

A24 - Unusual anatomical variation of renal arterial vasculature: A case report in University of Rwanda anatomy lab

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ABSTRACT

INTRODUCTION: The renal arteries branch off laterally and directly from the abdominal aorta, at the level of the IV disc between the L1 and L2 vertebrae. Classically supplied by a single renal artery, renal arterial vascular supply variations are common in terms of number, course and source due to complex embryogenesis.

CASE PRESENTATION: During dissection of the abdomen, the right kidney was dissected; with the exploration of the right renal hilum, we observed the following variation: From abdominal aorta to the Right kidney: the first branch was an accessory renal artery superior to, and crossing anteriorly the main renal artery to supply the inferior pole. Main renal artery, arose infero-posterior to the accessory renal artery, giving off two divisions. The inferior division goes posteriorly to the hilum, becoming the posterior hilar artery. The superior division of the main renal artery divides to give two branches: The superior branch descends infero-anterior to the inferior branch and supplies the anterior part of the hilum, becoming the anterior hilar artery. The inferior branch splits into 3 segmental arteries supplying the superior lobe.

CONCLUSION: Knowledge of the anatomy of renal blood supply and its variation is of utmost importance to renal transplant surgeons and radiologists. Detailed and large sample-sized studies, should be undertaken to determine patterns of variation in renal arterial vascularization.

A25 - Bilateral variation in a merging of medial and lateral roots of median nerve with interposed vascular structures: A case report

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ABSTRACT

INTRODUCTION: The median nerve carries both somato-motor and somato-sensitive properties. Classically described as the nerve of pronation, flexion of the thumb, index and middle finger, and wrist. Composed of both Lateral and medial roots, which classically merge to form the median nerve at the level of the axilla.

CASE PRESENTATION: During anatomical dissection of the upper limb, key findings were noticed on both the right and left upper limbs. On the Left upper limb: the medial and lateral root of the left median nerve made a long trajectory to be fused at the mid-arm level, with the left ulnar collateral artery interposed between the two roots. On the right upper limb: a notable discrepancy in the length of lateral and medial roots, with the latter being longer fused in the arm. Important to note the presence of a branch of the brachial vein interposed between two roots.

CONCLUSION: Anatomical knowledge of the variation of merging of the median nerve, associated structures, and clinical implications is of paramount importance. Such variations can be misleading in nerve block, associations with post-nerve block hematomas, and constant pulsatile pain as a result of arterial interposition between the roots (median nerve neuralgia). Detailed studies will bridge the gap in the paucity of data on variations and clinical relevance.

A26 – Anatomical Variations of the neurovascular structures at the medullo-spinal junction

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ABSTRACT

INTRODUCTION: The medulla-spinal junction is a vital area found in the craniovertebral junction, a complex region between the skull base and the upper cervical spine. This junction is surrounded by neurovascular structures, which may cause variation. Knowledge of the variations of these neurovascular structures at the medullo-spinal junction and their anatomical relation to the vertebral artery may help clinicians localize pathology in clinical practice. This study aims to identify the pattern and topographical arrangement of the neurovascular structures at the medullo-spinal.

METHODS: 11 specimens were used, and each right and left structure was examined individually. A descriptive and topographic anatomical study was used. Craniotomy of occipital bone and laminectomy from the atlas to T3 to expose rootlets of 4 lower cranial nerves and intradural parts of vertebral artery and PICA were made. Structures were captured and examined using the camera.

RESULTS: Of 22 upper spinal nerves studied, 16 (72 %) have dorsal rootlets on the C1 spinal nerve, and 75% connect with CN IX's spinal root. The accessory nerve has cranial and spinal roots. In the 22 CNXI nerves studied, 20 (99.9%) of the spinal roots have a connection with the C2 dorsal rootlets. The average number of rootlets for the lower cranial nerves were 4, 1, and 4 for vagus, glossopharyngeal, and hypoglossal nerves, respectively. Two distinct forms of PICA origin were identified: intradural and extradural, accounting for 72.7% (n=16) and 18.1% (n=4), respectively. All intradural segments of the vertebral arteries do not cross the longitudinal axis of the lower cranial nerves.

CONCLUSION: The variation in dorsal rootlets, lower cranial nerves, and PICA was observed in this study. Hence, having a grasp of these variations is essential for enhancing surgical preparations, minimizing potential complications, and advancing patient results

A27 - Aberrant renal blood supply in a trilobulated kidney: A case report

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ABSTRACT

INTRODUCTION: Renal blood supply is made by a pair of renal arteries and veins. Renal arteries arise directly from the abdominal aorta below the origin of the superior mesenteric arteries. Renal veins also drain directly into the inferior vena cava. Accessory arteries or veins if present, may enter the kidney at the hilum or on any surface of the kidney.

CASE PRESENTATION: During the surgical anatomy dissection of the abdomen (retroperitoneal space), we observed variations in renal vessels and hilar structure arrangement. The right kidney was a trilobulated kidney, with each lobe having its lobar artery coming from the right renal artery before entering the hilum. Its venous drainage was through the right renal vein, which was exiting the hilum as a single vein contrary to the artery. An accessory right renal vein was also noted, draining from the anterior aspect of the middle lobe and directly into the inferior vena cava above the right renal vein. The left kidney had one renal artery, dividing into two branches before entering the hilum. The venous drainage was through the renal vein, which was exiting the renal hilum as a single vein. An accessory left renal vein was noted, exiting through the renal hilum posterior to the renal pelvis, and was uniting with a lumbar vein to make a common vein emptying in the inferior vena cava. While entering the hilum, the artery was anterior to the renal vein, and with the renal pelvis posterior to the right renal vein for both kidneys, contrary to the usual arrangement.

CONCLUSION: Thorough knowledge of the normal as well as variations in renal vascular anatomy is important for surgeons, especially in this era where mini-invasive surgery is advancing.

A28 – Unusual variation of the aberrant right subclavian artery and bi-carotid trunk: A Case Report

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ABSTRACT

INTRODUCTION: The typical branching pattern of the aortic arch branches consists of the left common carotid artery (LCCA), the left subclavian artery (LSA), and the brachiocephalic trunk (BCT). However, variations in this pattern have been associated with various pathologies. Understanding these potential aortic arch variants is crucial for anatomists, cardiologists, radiologists, and vascular and thoracic surgeons.

CASE PRESENTATION: A human donor was dissected during the Undergraduate Medical Student Anatomy dissection course. The thoracic cavity and neck of the donor were exposed and a variation branching pattern of the arch of aorta was demonstrated. The aberrant right subclavian artery (ARSCA) originated from the thoracic aorta, passing posterior to the esophagus and subsequently branching in its usual manner. Additionally, the aortic arch exhibited a bi-carotid trunk, a common trunk for both the right and left common carotid arteries.

CONCLUSION: The presence of both the aberrant right subclavian artery and the bi-carotid trunk represents rare congenital anomalies of the aortic arch, often asymptomatic and often discovered incidentally. These variations are clinically significant due to their potential to cause compressive symptoms or to be associated with other congenital abnormalities. Awareness of such variations is essential for clinicians in anatomy, cardiology, radiology, and surgery to ensure accurate diagnosis, and appropriate management.

A29 - Branching patterns of brachial plexus in laboratory of Human Anatomy Department at the University of Rwanda: A human donor study

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ABSTRACT

INTRODUCTION: The brachial plexus is a major nerve network that gives both sensory, motor, and sympathetic innervation to the upper limb. It is highly variable in its formation and branching pattern; thus, knowledge of its anatomical patterns is of clinical importance.

METHODS: Ten brachial plexus were dissected and examined to assess the branching pattern, variations, and morphometry. For each dissected brachial plexus, an image was taken, recorded, and interpreted.

RESULTS: The typical branching patterns of all trunks, divisions, cord, and terminal branches were observed in most brachial plexus (90%). The morphometrical study of the brachial plexus demonstrates that the length of the C5 root was found to range from 4.1cm to 4.8cm. The median length of the C5 was found to be 4.5cm with a standard deviation of 0.21, while the mean was found to be 4.47cm. The shortest trunk was found from the superior trunks with 2.5cm, while the longest was found to be from the middle trunks (3.1cm). The mean length for the 10 superior trunks was found to be 2.61cm (SD=0.10). The posterior division from the superior trunk, which contributes to the formation of the posterior cord, was found to be very short, at only 1.1cm. The longest cord observed was the medial cord, which was 5.5cm long, and the shortest was the posterior cord, which was 2.9cm long. One case of variation was observed. The right musculocutaneous nerve leaves the lateral cord, penetrates within the Coracobrachialis muscle, then leaves it with 2 branches. One branch continues as the musculocutaneous nerve, and another branch continues to join the median nerve.

CONCLUSION: The present study shows one case of Brachial plexus variation, and it indicates that the morphometry of Brachial plexus differs from that of one human donor to another.

A30 - A glance upon rib chronic osteomyelitis. Case report

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ABSTRACT

INTRODUCTION: Rib chronic osteomyelitis is rare, accounting for less than 1% of all cases worldwide. It presents with swollen redness and insidious symptoms, which can delay treatment. Few cases have been reported based on clinical presentation, and there is limited data on rib osteomyelitis in Rwanda.

CASE PRESENTATION: We reported a 15-year-old male patient who sustained a blunt injury over his right chest. This was following an incident with a wall that fell on him. He presented to the University Teaching Hospital of Butare (CHUB) 6 months after the initial injury with features of right 7th rib chronic osteomyelitis. After full assessment, he underwent sequestrectomy and partial 7th rib resection with 6 weeks of antibiotics, with good improvement.

CONCLUSION: Osteomyelitis of the rib is a rare condition that presents with or without a trauma history. The clinical presentation is uncommon; diagnosis requires a high index of suspicion by a clinician.

A31 - Artificial Intelligence (AI)-related cost savings in global neurosurgery: A systematic review

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ABSTRACT

INTRODUCTION: According to the World Health Organization (WHO), between 11%-15% of global injuries are caused by surgically treatable diseases, yet of the 250 million surgical procedures carried out globally, only a mere 3.5% take place in LMICs. Approximately 5 million individuals in LMICs require but never receive neurosurgical care due to workforce deficits, insufficient infrastructure, and inadequate training facilities, limiting access to neurosurgical research as well as access to it. As the global neurosurgery movement aims to bridge this significant gap, the role of integrating AI-based technologies in Global Neurosurgery becomes increasingly important.

METHODS: We conducted a systematic literature search in MEDLINE, Scopus, and the Cochrane Library to explore the cost savings associated with the application of AI in global neurosurgery. Two independent reviewers screened and selected articles, resolving disagreements through a third reviewer and a discussion between them.

RESULTS: AI-based technologies have contributed to significant cost savings in neurosurgical care by reducing hospital readmissions, optimizing stroke management, accelerating triage processes, and enabling personalized treatment pathways, particularly in low-resource settings. These interventions also maintained or improved clinical outcomes, such as high diagnostic accuracy, reduced infection rates, fewer revision surgeries, and enhanced overall patient quality of life and survival rates.

CONCLUSION: The key findings across the studies indicate that AI-based technologies can reduce costs in neurosurgery globally. The potential for AI to optimize resource allocation, reduce hospital readmissions, and improve triage efficiency was highlighted in multiple studies. However, the integration of AI into existing healthcare infrastructures, particularly in LMICs, requires further research and investment to fully realize these cost-saving benefits.

A32 - Systematic Review of herbs used in the management of Alzheimer's disease in East and West Africa

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ABSTRACT

INTRODUCTION: Alzheimer's disease (AD) is a neurodegenerative disorder affecting the central nervous system, primarily affecting older individuals. It is the seventh most common cause of death worldwide and is characterized by memory loss, speech impairment, and cognitive decline. Three main theories are the cholinergic hypothesis, the Amyloid hypothesis, and the Tau hypothesis. Pathogenesis in AD patients is linked to senile plaques and neurofibrillary tangles. Medicinal plants and herbs have shown promise in managing AD symptoms.

METHODS: Scientific databases - PubMed, SpringerLink, and Google Scholar were searched to compile literature about East and West African medicinal plants and their potential for managing AD. To determine which publications were relevant, we employed the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA). Summary information on their pharmacological activity was provided.

RESULTS: By using PRISMA, we identified six articles from 124 eligible records in East and West Africa. West Africa uses plants like *Crinum glaucum* and *Peltophorum africanum* for memory-enhancing and AChE inhibition, often using multi-herb formulations. East Africa prefers plants like *Agapanthus africanus* and *Carpobrotus edulis* for their anti-inflammatory and neuroprotective properties. Traditional medicine in East Africa emphasizes single-herb treatments.

CONCLUSION: In conclusion, the regional differences in using medicinal plants in managing Alzheimer's disease in East and West Africa highlight the need for culturally and geographically tailored treatments. Further research, including randomized controlled trials, molecular mechanisms studies, and collaborations between traditional healers and scientists, is suggested to translate these herbal remedies into safe, effective therapies for widespread use across Africa.

A33 - A systematic review of the considerations of orbital anatomy in the pathophysiology and diagnosis of thyroid eye disease

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ABSTRACT

INTRODUCTION: Thyroid eye disease (TED), also known as Grave's orbitopathy, is a complex autoimmune disease of the orbit affecting the orbital contents. TED affects a third of people with Graves' disease, mainly young and middle-aged people, who are at an important stage in their careers. If not well managed, it can hinder their chances of progressing. The involvement of extraocular muscles, orbital bony walls, orbital fat, and connective tissues accounts for clinical manifestations of TED, including proptosis, diplopia, and visual impairment. A thorough understanding of unique orbital anatomy is essential for precise diagnosis and successful management of TED.

METHODS: A comprehensive review of the current literature was undertaken, with a particular emphasis on the anatomical structures within the orbit, encompassing the extraocular muscles, orbital fat, and connective tissue. The analysis centered on elucidating the influence of orbital anatomy on the pathogenesis, clinical manifestations, and diagnosis of TED.

RESULTS: 70% of patients with TED present with extraocular muscle enlargement, typically in the inferior and medial recti. Other structures like the orbital fat and soft tissues also enlarge, increasing congestion within the orbital cavity. The confinement of the orbital soft tissues by the bony orbit on all sides except anteriorly leads to the protrusion of the eyes anteriorly when there is an enlargement of orbital structures, which leads to proptosis, one of the key symptoms of TED. The proptosis of the eyeball increases the exposure of the cornea, leading to dryness and irritation. Compression of the optic nerve and blood vessels by enlarged extraocular muscles and other orbital soft tissues can contribute to optic neuropathy.

CONCLUSION: The rigid anatomy of the orbital bones leads to the forward protrusion of the eyeball as the orbital soft tissues and extraocular muscles enlarge and increase the pressure in the orbital cavity. Consideration of orbital anatomy and correlation with imaging can help in TED's early diagnosis and treatment plans.

A34 - Blending Virtual and Traditional Methods in Anatomy Education

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ABSTRACT

INTRODUCTION: Anatomy education is critical in medical training, traditionally relying on cadaveric dissection. However, challenges such as cadaver scarcity, ethical concerns, and emotional distress among students necessitate alternative approaches. Emerging technologies, including the Anatomage Table and digital anatomy apps, offer innovative solutions to these challenges. This study aims to evaluate the effectiveness of integrating digital anatomy tools with traditional cadaveric dissection to solve the challenge of a limited number of cadavers and ethical considerations and to enhance medical students' learning outcomes and emotional well-being.

METHODS: A mixed-methods study will be carried out with medical students, employing a quasi-experimental design. Participants will be divided into three groups: traditional cadaveric dissection, digital tools, and a blended method. Pre- and post-tests, practical exams, and qualitative interviews will be conducted to assess the attitude of students towards cadaveric use and digital tools, and the impact on learning outcomes and emotional responses.

EXPECTED RESULTS: It is anticipated that the blended method will result in improved spatial understanding and retention of anatomical knowledge compared to traditional methods alone, while also reducing the emotional burden on students and addressing unethical concerns.

CONCLUSION: Integrating digital tools with traditional methods may offer a more comprehensive and emotionally supportive anatomy education. Further exploration and adoption of these technologies are essential to advance medical education in the digital age.

A35 - Enhancing anatomy education through Virtual Reality (VR)

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ABSTRACT

INTRODUCTION: Traditional anatomy teaching has widely relied on cadaver dissection and physical models; these methods tend to be resource-intensive and also not universally accessible to learners. VR is a new way to immerse the student into these environments so that they become truly interactive.

METHODS: The VR classroom will be developed using the HoloAnatomy software package, which is a state-of-the-art tool famous for its high-resolution 3D anatomical models. This will be installed in a dedicated VR lab at the University of Rwanda, where students can be fully immersed in the learning environment. Setting up the virtual reality classroom at the University of Rwanda will be a well-structured process, incorporating technological innovations and pedagogical aspects that ensure the platform is effective and easy to use.

CONCLUSION: The implementation of a virtual reality classroom at the University of Rwanda represents an important step forward in digital anatomy education, offering immediate interaction in ways that traditional methods rarely provide. However, it must be recognized that many students may have limited experience with advanced anatomical software tools, so another crucial component of this program will be comprehensive training.

A36 - Importance of anatomy dissection course on early career engagement for undergraduate students at the University of Rwanda

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ABSTRACT

INTRODUCTION: Medical education is a long training that requires trainees to be involved early in their careers. Anatomy is a core course in medicine with a theoretical and important practical part. Dissection courses are paramount in the practical part of anatomy, but they require infrastructures, enough cadavers, and others, which hinders effective teaching in resource-constrained settings. This narrative review discusses the importance of Anatomy Dissection courses on early career engagement for undergraduate students at the University of Rwanda.

METHODS: An unrestricted search was done in Pubmed and Google Scholar for articles published between 2019 and 2024. focusing on anatomy education and dissection courses for undergraduate students.

RESULTS: We identified Fourteen papers, that focused on the importance of leveraging the clinical skills of undergraduate students, and building confidence toward being successful surgeons in the future. We also found that undergraduate students' research skills are leveraged, improving their professional growth and learning anatomical variations in case report writing. We also found some setbacks impacting the students joining anatomy dissection courses, including the inadequate number of undergraduate students joining, low laboratory, and inadequate cadavers.

CONCLUSION: We should find strategies to involve medical students in dissection courses since, from the current evidence, earlier involvement positively impacts the student's career.

A37 - A review of digital anatomy resources for medical students at the University of Rwanda: Optimizing, user-friendliness, and accessibility

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ABSTRACT

INTRODUCTION: Anatomy is a foundational discipline in medical education, for understanding human structure and function, yet the rapid advancement of digital technologies is transforming medical education, particularly in anatomy. The University of Rwanda (UR) has historically depended on traditional cadaver dissections for anatomy education. Now, it recognizes the potential of digital anatomy resources to enhance learning by integrating digital resources into the curriculum despite its low- and middle-income country context.

METHODS: A two-methodological approach was employed: a comprehensive literature review and an investigation into the specific digital anatomy resources available at UR. The literature search included studies published between January 2010 and August 2024 from PubMed, EMBASE, and Rwanda Medical Journal by searching keywords. The search was restricted to publications written in the English language and to articles describing digital anatomy teaching tools for human anatomy, plus those reflected in the review of its impact at the University of Rwanda. The second involves consulting faculty members about available resources.

RESULTS: The review found that UR provides access to advanced tools like the Anatomage system and a radio-anatomy laboratory, which enhance understanding of anatomical concepts and research yielded other best resources, including Complete Anatomy, Acland's video and TeachMe anatomy app that are highly recommended. However, challenges such as limited access time to resources and unreliable internet connectivity were identified. The digital resources generally cover the UR anatomy curriculum comprehensively. Also, students show interest in other resources with features like offline phone access and gamification to improve user engagement.

CONCLUSION: The findings suggest that UR can enhance learning outcomes by increasing access to affordable digital anatomy subscription apps, incorporating other student-desired features, and maintaining traditional cadaver dissections alongside digital methods. These changes could empower students to excel in their anatomical studies, contributing to improved healthcare outcomes in Rwanda.

A38 - Prevalence of post-caesarean section surgical site infections in Rwanda: A systematic review and meta-analysis

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ABSTRACT

INTRODUCTION: Caesarean section (C-section) is the most performed major surgery worldwide. About 15% of births are delivered through C-section in Rwanda. The post-cesarean surgical section is one of the most frequent complications that follow a C-section. This systematic review and meta-analysis aims to estimate the pooled prevalence of surgical site infections following cesarean section deliveries in Rwanda.

METHODS: A comprehensive search was conducted across PubMed/MEDLINE, Google Scholar, DOAJ, AJOL and the Cochrane Library to identify primary studies on post-caesarean surgical site infections in Rwanda. Studies meeting predetermined criteria were included, and their quality was assessed using the JBI Critical Appraisal Tools. Heterogeneity was evaluated using I² statistics, while publication bias was examined via funnel plots and statistical tests. Pooled prevalence was calculated using Jamovi 2.3.28 software, with subgroup analysis conducted to identify sources of heterogeneity. Statistical significance was set at $p < 0.05$.

RESULTS: From 139 articles initially searched from the databases, only 17 studies with 8, 082 individuals were finally included in the systematic review and meta-analysis. Using the random-effects model, the pooled estimate of post-C-section SSI prevalence in Rwanda was 6.85% (95% CI 5.2, 8.5). Subgroup analysis based on publication year, sample size, hospital, and study design showed no much difference in SSI prevalence.

CONCLUSION: The current systematic review and meta-analysis indicate that post-caesarean surgical site infections are significant in Rwanda. A collaborative effort is required to lower post-C-section SSIs and provide the best surgical care in the country.

A39 - The role of wearable digital health technologies in enabling continuous, real-world monitoring of anatomical systems and physiological processes: Opportunities for implementation in Rwanda

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ABSTRACT

INTRODUCTION: Wearable digital health technologies (DHT), such as smartwatches and activity trackers, are increasingly being used to monitor physical activity, sleep, and other physiological data. Ranging from smartwatches to adhesive sensor-containing, wearable DHT has the potential to become integrated into cardiovascular medicine, with applications ranging from remote monitoring of chronic conditions to arrhythmia screening currently being assessed. Rwanda, with its strong digital health infrastructure and commitment to universal health coverage, has the potential to leverage wearable DHT for continuous health monitoring and improved healthcare outcomes.

METHODS: This study reviewed three scientific articles sourced from PubMed and the Jama network, published between April 2021 and June 2023. The first article, by Ferguson et al., was a systematic review that analyzed the impact of activity trackers on physical and psychological outcomes. The second article by Szeto et al. examined randomized controlled trials assessing the role of wearable devices in reducing sedentary behavior. The third study by Wu et al. utilized a random-effects model to evaluate wearable devices' effects on body composition and physical activity.

RESULTS: Across 39 studies involving 163,992 participants, wearable trackers were found to significantly increase physical activity, with standardized mean differences (SMD) ranging from 0.3 to 0.6, equating to approximately an average of 1800 additional steps per day and 40 extra minutes of walking. Among older adults, improvements in moderate-to-vigorous activity and body composition were observed. However, the effects on physiological markers like blood pressure, glycosylated hemoglobin, and cholesterol were small. In hospitalized populations, wearable devices did not significantly impact mental health or hospital stay duration but did reduce sedentary behavior.

CONCLUSION: Wearable DHT offers promising opportunities for continuous health monitoring in Rwanda. While challenges such as cost and data privacy remain, integrating wearable data into healthcare systems could enhance chronic disease management and early detection.

A40 - Enhancing contraceptive access in Rwanda: The promise of Sayana Press in overcoming barriers

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ABSTRACT

INTRODUCTION: Rwanda has made significant strides in contraceptive use, with the prevalence rate among married women rising from 58% in 2019 to approximately 64% in 2024. Our study examines the current contraceptive landscape in Rwanda, focusing on the effectiveness, health impacts, and socio-cultural challenges associated with prevalent methods: female sterilization (24%), male condoms (21%), intrauterine devices (IUDs) (17%), and hormonal methods such as pills, injections, and implants (26%). Hormonal methods, while effective, can lead to side effects such as weight gain and mood swings, whereas IUDs offer long-term protection but may cause cramping and heavier periods. Barrier methods, although effective in preventing STIs, can affect sexual satisfaction. Key challenges identified include cultural and religious barriers, limited rural access, economic constraints, and misinformation.

METHODS: To address these issues, we propose the introduction of Sayana Press, a self-administered, three-month injectable contraceptive produced by Pfizer Inc. Containing medroxyprogesterone acetate (MPA), Sayana Press offers a discreet, low-maintenance solution with long-term efficacy. Its self-administration feature can enhance access, especially in remote areas where traditional methods encounter barriers.

RESULTS: This method's potential to address cultural resistance and user error, combined with support from global health programs, positions it as a valuable addition to Rwanda's family planning services. Successful adoption will depend on comprehensive training and education to maximize its benefits and impact.

CONCLUSION: With proper implementation and support, Sayana Press has the potential to further enhance contraceptive access and effectiveness, ultimately contributing to improved reproductive health outcomes across the country.

A41 - Patella blood supply: arthroplasty perspectives

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ABSTRACT

INTRODUCTION: A clear understanding of the Patella blood supply is paramount in knee surgery, especially knee arthroplasty. Knee arthroplasty remains a successful procedure of the century. However, a number of complications arise from disruption of the patella arterial system, including patella avascular necrosis at 10 to 15%. This study highlights the patella blood supply and the best practice to prevent patella blood supply disruption during knee arthroplasty.

METHODS: An Unrestricted search was done in Pubmed and Google Scholar looking for articles published in English focusing on patella arterial supply in relation to knee arthroplasty using the following Keywords: "Knee arthroplasty AND patella blood supply", "Patella blood supply and Avascular necrosis" and "Patella blood supply". We have only retained articles with full access to the entire article, and there was no time restriction

RESULTS: The arterial blood supply to the human patella comes from the extraosseous arterial system, which consists of five to six arteries. These arteries originate from the peripatellar anastomotic network known as rete patellae, which perforates the quadriceps tendon with synovial tissue. The major arterial supply comes from the medial side; hence, the lateral parapatellar approach is safer for preserving patella vascularity than the medial one. Among other techniques preserving vascularity, there is patella retraction instead of eversion, and lateral retinacula release by preserving the superior lateral genicular artery.

CONCLUSION: Patellar anatomy should be considered during total knee arthroplasty, and surgeons should adhere to surgical techniques that preserve the patella vascularity to avoid potential complications, including patella vascular necrosis.

A42 - Exploring the factors influencing stress from cadaver dissection (CD) linked to learning conditions: Evidence from different medical schools in Africa

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ABSTRACT

INTRODUCTION: Exposure to the dissection of human cadavers is a stressful experience that creates a variety of symptoms among medical students. Several studies have examined the relationship between students' perception of cadaveric dissection in anatomy laboratories and its associated learning conditions. The purpose of this review was to identify and examine these factors.

METHODS: A cross-sectional study was done using a self-administered questionnaire to collect relevant data on learning conditions during the CD experience of the participants, involving almost 3,000 students from nine countries in Sub-Saharan Africa, including both medical students and graduates.

RESULTS: About half of the participants in the studies regarded cadaveric dissections as stressful, while the other half was more curious and excited than nervous. However, about two-thirds of students whose cadaveric dissection took longer than 3 hours considered it as extremely stressful. Similarly, participants from institutions with a student-donor ratio of 10-20 students and more per cadaver described their experience as "*stressful*", compared to the others with a ratio of 5-10 students per cadaver. Additionally, participants who had at least 2-5 lecturers present to guide them during cadaveric sessions considered experience less stressful compared to those who had just 1 lecturer present.

CONCLUSION: Students are more likely to think of CD as stress-free if their school has CD instructors, shorter CD sessions, and a lower student-donor ratio. Reducing CD time to about 1-3 hours and increasing student support during CD could be ways to lessen the stress associated with CD.

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