

**Anatomical Society of Southern Africa
World Anatomy Day celebration
Online symposium**

Date: 13 October 2023

Time : 11h00 – 14h30

Venue: Zoom

<https://ukzn.zoom.us/j/95994367236?pwd=ZHlxQ3hFSFZtTlFhTllwSIRtUGtOZz09>

Cost : Free

11h00 – 11h10	Welcome	P Pillay
11h10-11h20	ASSA President Address	A van Schoor
Session Chair: C Creamer & S Ishwarkumar		
11h10 – 11h20	The branching pattern of the left coronary artery in a South African population: a cadaveric study	J Maclean
11h20 – 11h30	The anatomical variations in the hilum structures and hilar arrangement on the South African cadaver samples	M Mabaso
11h30-11h40	Morphometric and morphological analysis of the distal humerus	AT Cele
11h40-11h50	Effect of the hydroethanolic extract of <i>Boophone disticha</i> on behaviour and histomorphometry of the adrenal gland of stressed female Balb/c mice	AT Sebelebele
11h50 – 12h00	Morphological variations of lung fissures - a South African cadaveric study	R Seleka
12h00 – 12h15	Q and A	
12h15- 12h30	Elsevier Presentation during break	
12h30 – 12h40	The effects of ibogaine on myelination in Sprague Dawley rats	D Govender
12h40 – 12h50	Craniofacial form and masseter muscle anatomy in relation to sex: a radiographical and cadaveric study	T Cele
12h50 – 13h00	Anatomical study of the Pterion in a South African population of KwaZulu-Natal.	MG Mahlalela

13h00-13h10	Assessing the Accuracy of Biological Profiles in Forensic Casework: A Retrospective Study of Cases Submitted by Stellenbosch University (2014-2022)	M Rahube
13H10 – 13H20	Branching Pattern of the Internal Iliac Artery in a Free State Cadaveric Sample	MJ Nkoi
13h20 – 13h30	Q & A	
ANATOMY ART SESSION		
13h30 – 13h45	Coronary artery study Heart study	L Shapiro
13h45 – 14h00	UFS Art Exhibition	S Govender
14h00 - 14h15	3D Prints & Paint	J Ackermann
14h15 – 14h20	Closing Announcement of 2 lucky draw winners: <i>Prize \$100 book voucher sponsored by Elsevier</i>	P Pillay

Anatomy Art may be accessed via :

<https://drive.google.com/drive/folders/1qORfijYFWx8dliOdzr7Nu2g0Kqwu5FzW?usp=sharing>

ABSTRACTS

J Maclean, J Garlick, J Wagner, K Mpolokeng

The branching pattern of the left coronary artery in a South African population: a cadaveric study.

Department of Human Biology, Anatomy Building, Faculty of Health Sciences, University of Cape Town, South Africa

The left coronary artery (LCA) originates at the left aortic sinus, providing the heart with oxygen and nutrients. This study aimed to record the anatomical variation of the LCA in a select South African sample. This was a quantitative, observational and cross-sectional study done at the Department of Human Biology, University of Cape Town. 48 cadaveric hearts of both sexes (24 M; 24 F) were dissected. The LCA was dissected from its origin until its termination into the various branches. Length, origin, branching pattern, conducting portion arterial supply and coronary dominance was recorded. Permission for this study was granted by the Cadaver Research Governance Committee, Department of Human Biology, Faculty of Health Sciences, University of Cape Town (CRCG 2023/004).

The mean length of the main trunk of the LCA was 12.31± 4.05 mm. In all hearts the LCA originated from the left aortic sinus. The LCA bifurcated in 50% of hearts, trifurcated in 40.9% and tetrafurcated in 9.1%. The sinoatrial nodal artery originated from the right coronary artery in 55.6% of hearts, from the proximal and distal left circumflex artery in 38.9% and 5.5%, respectively. Coronary dominance recorded as right dominant in 90.2% and left in 9.8% of hearts.

The data recorded provides population specific variations regarding the anatomy of the left coronary artery, and may be critical for correct diagnosis and treatment of various coronary artery disorders.

M Mabaso, K Mpolokeng, M Petersen

The anatomical variations in the hilum structures and hilar arrangement on the South African cadaver samples.

Department of Human Biology, Anatomy Building, Faculty of Health Sciences, University of Cape Town, South Africa.

The lung hilum is the point that transmits the structures entering and exiting the lung in the mediastinal region. The phrase “root of the lung” collectively refers to all the structures found at the hilum: the primary bronchus, pulmonary artery, and two pulmonary veins. The hilar pattern plays an important role when it comes to surgical procedures and diagnoses of pulmonary or lung diseases, therefore recognizing and understanding the variations in the hilum and arrangement in the hilar pattern could be very helpful for surgeons when it comes to making correct diagnoses and providing appropriate treatment to patients. The study aims to investigate and explore the anatomical variation in the lung hilar patterns.

This was a cross-sectional and observational study. A total of 48 formaldehyde-fixed bodies (48 right and 48 left = 96 lungs) from both the male and female sex from the Department of Human Biology at the University of Cape Town, were observed and recorded for the anatomical variation in the arrangement of hilar structures. The ethical approval was given by the cadaveric research governance committee (CRGC). Right lungs: 72.9% had a typical superior-to-inferior hilar arrangement, and 18.8% had variations. 72.7% had the usual anterior-to-posterior hilar arrangement, and 27.3% had variations. Bronchus: 65.9% had two, and 34.1% had one. Arteries: 95.5% had one, 4.4% had two. Veins: Various numbers observed. Left lungs: 93.8% had a typical superior-to-inferior hilar arrangement, 2.1% had variations. 78.3% had the usual anterior-to-posterior hilar arrangement, and 21.7% had variations. Arteries: 97.8% had one, 2.2% had two. Veins: Various numbers observed. Bronchi: 91.3% had one, 8.7% had two.

The hilum plays an important role when it comes to clinical practice such as surgical diagnoses, and treatment for patients. Therefore, understanding the variations in the hilum allows accurate diagnosis and treatment planning for individuals with pulmonary illness.

R Seleka, M Petersen , K Mpolokeng

Morphological variations of lung fissures - a South African cadaveric study

Department of Human Biology, Anatomy Building, Faculty of Health Sciences, University of Cape Town, South Africa

Lungs are essential respiratory organs divided into lobes by fissures. The right lung is divided into the superior, middle, and inferior lobes by the horizontal and oblique fissure, while the left lung is divided into the superior and inferior lobe by the oblique fissure. These fissures are essential for the movement of lobes against each other. This study aimed to investigate and record the variations in the morphology of lung fissures and lobes.

This was a cross-sectional observational study with a descriptive analysis. A total of 48 formalin fixed bodies comprising of females (n=24) and males (n=24) from the Department of Human Biology at the University of Cape Town were studied. Ethical approval was given by the Cadaveric Research Governance Committee (CRGC). The degree of completeness of the fissures were classified according to the Craig and Walker's criteria.

The results presented were recorded in both the left and right lungs. In the right lung, 11.1% had Grade 1 horizontal fissures, 4.4% had Grade 2, 60.0% had Grade 3 and 24.4% had Grade 4. For oblique fissure, 42.2% were Grade 1, 15.6% were Grade 2, 40.0% were Grade 3 and 2.1% were Grade 4. In the left lung, 31.9% had Grade 1 oblique fissures, 25.5% had Grade 2, 36.2% had Grade 3 and 6.4% had Grade 4. Accessory fissures were found in 28.9% of right lungs and 17.0% of left lungs.

Few variations were found in both the left and right lungs, however, the right lung showed the most variability with a high prevalence of incomplete fissures. Knowledge of these variations may be essential to clinicians for planning various surgical procedures where a variant fissure may cause pre- and post-operative complications.

AT Sebelebe¹, P Nkomozepl², EF Mbargiorgu³, NK Xhakaza¹

Effect of the hydroethanolic extract of *Boophone disticha* on behaviour and histomorphometry of the adrenal gland of stressed female Balb/c mice

1 Department of Anatomy and Histology, Sefako Makgatho Health Sciences University, Ga-rankuwa, Pretoria, South Africa, 2 Department of Human Anatomy and Physiology University of Johannesburg, Doornfontein, South Africa, 3 School of Anatomical Sciences, Faculty of Health Sciences, University of the Witwatersrand, Johannesburg, South Africa.

Amaryllidaceae plants have been shown to have antidepressant properties with *Boophone disticha* (*BD*) being one of the most researched plant from this kingdom plantae. Part of the antidepressant mechanism of action of *BD* is the reduction of corticosterone, and increase in brain derived neurotropic factor previously shown in male Balb/c mice. Stress also induces cellular hypertrophy of cortex of the adrenal gland due to increase in corticosterone production.

The current study investigated effects of *BD* on behaviour (Elevated plus maze) and adrenal gland histology of 20 female Balb/c mice (Ethics No. 2021/02/01D) exposed to 28 days chronic restraint stress. Animals were divided in control, *BD*, vehicle and fluoxetine groups. The behaviour was video-recorded, and analysed in days 7, 14 and 21 during treatment. At termination, adrenal glands were harvested for histological analyses of thickness of cortical layers in H&E stained tissues using Image J software. Means were analysed using SPSS.

BD treatment significantly decreased anxiety like behaviour in elevated plus maze (i.e. increased time in open arms, increased open arm entries, decreased time in closed arms). Stress significantly increased the thickness of the cortex of the adrenal gland, while treatment with *BD* attenuated this increase. We conclude that *BD* is a potential antidepressant agent.

AT Cele, L Lazarus, V Bisetty

Morphometric and morphological analysis of the distal humerus

Department of Clinical Anatomy, School of Laboratory Medicine and Medical Sciences, College of Health Sciences, University of KwaZulu-Natal, Durban, KwaZulu-Natal, South Africa

The humerus is identified as one of the bones less likely to be severely damaged, and is favourable for sex estimation. This study aimed to evaluate sex estimation methods using the distal humerus in a select Black South African population.

The distal ends of 140 dry humeri were obtained and examined from the Department of Clinical Anatomy at the University of KwaZulu-Natal. The four morphological features studied were: Olecranon fossa shape, angle of the medial epicondyle, trochlea extension following Rogers (1999) method, and the presence of the supratrochlear foramen. The morphometric measurements taken were the breadth of the epicondyle and the width of the trochlea using a digital vernier calliper. (Ethical clearance BE:00002996/2021)

This study showed variation in the morphological features between males and females. Males presented with a triangular shaped olecranon fossa, flat medial epicondylar angle, an asymmetrical trochlear extension, and lower occurrence of the supratrochlear foramen. While, females presented with an oval shaped olecranon fossa, raised medial epicondylar angle, symmetrical trochlear extension, and higher occurrence of the supratrochlear foramen. The epicondylar breadth average was 61,8mm and 54,8mm in males and females, respectively. The average trochlear width was 18,8mm and 16,8mm in males and females, respectively.

In conclusion, this study found significant differences between the male and female humeri morphological features. It may be used in sex estimations for the black South African population.

D Govender¹, N Meulenberg², G Owen², T Calvey³

The effects of ibogaine on myelination in Sprague Dawley rats

¹School of Anatomical Sciences, Faculty of Health Sciences, University of the Witwatersrand

²Department of Molecular Medicine and Haematology, Faculty of Health Sciences, University of the Witwatersrand

³Department of Human Biology, Faculty of Health Sciences, University of Cape Town

The growing opioid epidemic is a worldwide issue which is prevalent in South Africa with the use of opioid cocktails such as nyaope. A possible solution to this problem is the use of psychedelic assisted psychotherapy. Ibogaine is a psychedelic that has been shown to curb addiction cravings and have neuroplastic effects in the brain. Ibogaine is extracted from the root bark of a West African plant and has shown to have neuroplastic effects in the brain. We investigated whether these antiaddictive properties are due to remyelination of the brain's white matter.

This study uses qPCR and western blotting to determine how myelin specific proteins and genes such as CNPase (CNP), Myelin Basic Protein (MBP) and Proteolipid Protein (PLP) are affected by morphine (opioids) and ibogaine. The experimental rat groups included a saline, morphine and ibogaine only controls, a combination morphine and ibogaine and a second combination morphine and ibogaine which included a 3 day withdrawal after ibogaine injection. CNP protein was increased in the second morphine ibogaine group ($p < 0,0001$) and the CNP mRNA fold expression was increased in the first morphine ibogaine group compared to the second morphine ibogaine group ($p = 0,0343$). The 18,5 kDa isoform of MBP had increased expression in the ibogaine control ($p = 0,0384$) and second morphine ibogaine group ($p = 0,0037$). PLP shows increased protein expression in the second morphine ibogaine group when compared to the first group ($p = 0,0464$). There is decreased PLP mRNA expression in the ibogaine control group when compared to morphine control ($p = 0,0033$), first morphine ibogaine ($p < 0,0001$) and second morphine ibogaine groups ($p = 0,003$). Ibogaine may cause remyelination following demyelination by morphine. A consistent trend in the data shows that the myelin proteins were increased after the 3 days after administration of ibogaine following chronic morphine administration compared to 1 day after administration of ibogaine. This suggests that remyelination takes between 24-72 hours before it begins to produce new myelin around the axons due to ibogaine. These results also shows that CNP and MBP increase in expression earlier than PLP and are good markers for early remyelination. This is consistent with increase in CNP mRNA expression for CNP seen in the first morphine ibogaine but not the second group revealing an immediate effect on mRNA but a delay in protein expression.

T Cele¹, L Naidu², OS. Aladeyelu¹ SK. Lawal¹ CO. Rennie¹

Craniofacial form and masseter muscle anatomy in relation to sex: a radiographical and cadaveric study

¹Discipline of Clinical Anatomy, School of Laboratory Medicine and Medical Sciences, College of Health Sciences, Nelson Mandela School of Medicine, University of KwaZulu-Natal, Durban, KwaZulu-Natal, 4001, South Africa

²Department of Anatomy, School of Medicine, Faculty of Health Sciences, University of Pretoria, Pretoria, Gauteng, 0001, South Africa

Masseter, being the strongest masticatory muscle, elevates and protracts the mandible while exerting masticatory forces during eating. Unlike, facial skeletal growth, the masseter anthropometry in the South African population has received less research attention. The growth of masseter as a soft tissue is dependent on the growth of the related facial skeleton. This study aimed to document the morphometrical differences of the masseter in relation to facial morphology according to sex. Twenty embalmed adult cadavers were dissected bilaterally ($n = 40$). In addition, fifty CT scans were analysed bilaterally ($n = 100$). The masseter length and width were measured on cadavers in relation to facial height, bizygomatic width and bi-gonial width. The masseter width and thickness were measured on CT scans in relation to width of the hard palate, maxillary AP diameter, bizygomatic, and bicondylar. Three origin points were observed: anterior, posterior and on the zygomaticotemporal suture. The common insertion point of the masseter was the body of the mandible (70%). Masseter width and thickness were higher on the left side (40.49 ± 6.20 mm and 14.30 ± 4.07 mm, respectively). Males possessed higher mean values for masseter thickness (15.34 ± 2.99 mm), width (42.44 ± 6.92 mm), and length (68.28 ± 6.50 mm) than females. The overall study showed differences in the morphometry of the masseter muscle with respect to all population groups (Black, Indian and White). The thickness of the masseter muscle was greatly affected by facial

skeletal morphometry. Knowledge of the morphology and morphometry of the masseter is useful in surgical procedures of the face and forensic facial reconstruction.

MG Mahlalela¹, S Ishwarkumar², P Pillay¹

Anatomical study of the Pterion in a South African population of KwaZulu-Natal.

¹Department of Clinical Anatomy, School of Laboratory Medicine and Medical sciences, College of Health Sciences, University of KwaZulu-Natal, Durban, KwaZulu-Natal, South Africa

²Department of Human Anatomy and Physiology, Faculty of Health Sciences, University of Johannesburg, Doornfontein Campus, P.O Box 524, Auckland Park, South Africa, 2006

Morphologically, the pterion marks the location of the four cranial bones, *viz.* frontal bone, sphenoid angle of the parietal bone, squamous part of the temporal bone, and the greater wing of the sphenoid bone. Population-specific differences exist in the position and union of the Pterion. The pterion is an important neurosurgical landmark for surgical procedures, *viz.* pterional/lateral approach, which provides wide access to the base of the skull. This study aimed to determine the position and incidence of the various sutural patterns of the pterion. Ethical clearance: (BE:00002996/2021)

Thirty-six dry human skulls (n=72) were obtained from the Department of Clinical Anatomy, University of KwaZulu-Natal. Morphometric parameters of the pterion were measured using a digital vernier caliper, while the morphological characteristics were examined using Murphy's classification scheme.

The mean distance from the pterion's center to the zygoma's midpoint was 44.4±4.1 mm in males and 45.1±4.6 mm in females, respectively. At the same time, the distance from the frontozygomatic suture was 32.7±4.7 mm and 32.6±4.8 mm in males and females, respectively. The sphenoparietal type of pterion was most prevalent at 55.6%, followed by the frontotemporal, stellate, and epipteric types with an incidence of 27.8%, 11.1%, and 5.6%, respectively. Population-affinity was observed.

The study concluded that the sphenoparietal type of sutural pattern was the most prevalent, with an incidence of 55.6%, While the epipteric type was the least prevalent. The comprehensive data about the position of the pterion is important for neurosurgeons, forensic scientists, and anthropologists.

M Rahube, C Marais, M Alblas

Assessing the Accuracy of Biological Profiles in Forensic Casework: A Retrospective Study of Cases Submitted by Stellenbosch University (2014-2022)

Division of Clinical Anatomy, Department of Biomedical Sciences, Faculty of Medicine and Health Sciences, Stellenbosch University

In the Western Cape, a substantial murder rate has increased the prevalence of unidentified bodies in mortuaries. To aid in identification, the biological profile which includes sex, age-at-death, living stature, and population affinity, contributes to positive identification. Therefore, the present study assessed the accuracy of the biological profiling performed by The Victim Identification Stellenbosch University (VISUN) unit to aid positive human identification.

After ethical approval (U23/04/244), data was obtained from three databases namely the Western Cape Forensic Pathology Services, VISUN and South African police services databases. After excluding cases involving archaeological remains, infants and other forensic

institutions, eighty-five cases were included ranging between 2014-2022. Thereafter, triangulation of the reports between the three databases determined a final sample size of 61 cases.

Specific to biological profiles, age estimation compared to actual age produced a strong positive relationship ($r=0.83$) indicating the accuracy of the profiling (age range). Regarding sex profiling, females were accurately identified (100%) with males to a lesser degree (92%). Based on these profiles, 23 individuals were positively identified.

Thus, the importance of biological profiling in providing a comprehensive profile which aids positive identification of unidentified individuals in both biological and forensic realms.

MJ Nkoi, S Govender, P Maas

Branching Pattern of the Internal Iliac Artery in a Free State Cadaveric Sample

University of the Free State

Pelvic ring disruptions brought upon by trauma often has multiple associated injuries, not the least of which is haemorrhaging of vessel that supply the organs in the pelvic cavity. These organs are supplied mainly by the internal iliac artery and knowledge of the branching patterns and common variations of the internal iliac artery may serve as a valuable tool for clinicians when managing bleeding. 21 formalin-fixed cadavers that met the inclusion criteria were dissected and the anterior division of the internal iliac artery was exposed. The branching pattern of the internal iliac artery was classified according to the Adachi (1928) classification. The frequency of the branching pattern of the internal iliac artery was documented and the measurements of the branches of the internal iliac artery and those of its anterior division were recorded. The branching pattern of the internal iliac artery was compared between left and right sides. Type 1 branching pattern occurred at 84%, while Type 3 and 5 occurred at 7.14% and 9.5%, respectively. Type 2 and 4 branching patterns were not observed in this study. The longest recorded average vessel length was the obturator artery at 52.07 mm, and the shortest average length was the superior gluteal artery at 2.59 mm. The most common variation observed was the origin of the obturator artery that originated from the external iliac artery in 47.6% of the sample as opposed to its normal origin from the anterior division of the internal iliac artery. The Type 1 Adachi (1928) branching pattern was the most common branching pattern, with Type 2 and Type 4 patterns not occurring at all. The most commonly observed variation was the origin of the obturator artery