

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

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Characterization of orbits in Sudanese population using computed tomography

توصيف المحاجر لدي السودانين باستخدام الاشعة المقطعية المحوسبة

A Thesis submitted for Partial Fulfillment for the degree

of Master (M.Sc) in Diagnostic Radiologic Technique

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بِسْمِ اللّٰهِ الرَّحْمٰنِ الرَّحِیْمِ

( وما اوتیتهم من العلم الا قليلا )

صدق اللّٰهُ العظیم

## Dedication

To my father how learned my that

Only man can defeat odds and arrive to the goals

To my mother how learned my that

Only love and compassion are the secret of the happy life

## Acknowledgment

First of all, I thank Allah the Almighty for helping me complete this research; I thank Dr. Caroline Edward Ayad, my supervisor for her help and guidance.

I would like to thank my brothers to support me for long time.

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## Abstract

Characterization of orbit in Sudanese population as measurement of orbital diameter by CT helps to understand the anatomical structure which helps in facial bone surgery.

The objectives of this study are measurement the diameter of orbit and to correlate the measurement with head dimension and age.

The study design is measurements of orbital width, orbital height, orbital index, biorbital width, introrbital width, and transverse head diameter were obtained in (mm). The study was carried out in ALModares Medical Center in Khartoum.

The result of the study showed the mean of orbital width was (37.022) mm, orbital height (33.682) mm, orbital index (91.01) mm, biorbital width (95.918) mm, interorbital width (24.444) mm, transverse diameter of head (133.098) mm. the mean orbital index (90.12) mm for males and (91.9) mm for females.

The study showed the mean of orbital index ( $89.5 \pm 4.173$ ) mm at age between (10-19) years old, ( $91.483 \pm 3.728$ ) mm at age between (20-29) years, ( $91.085 \pm 6.076$ ) mm at age between (30-39) years, ( $90.4713 \pm 4.064$ ) mm at age between (40-49) years, ( $91.08571 \pm 3.044$ ) mm at age between (50-59) years, ( $91.36364 \pm 2.990$ ) mm at age between (60-69) years, ( $90.88 \pm 4.293$ ) at age between (70-79) years.

The conclusion of the study there were linear relationships between orbital height, orbital width, orbital index, biorbital width, interorbital width and transverse diameter of head with age show from figure.

There were linear relationships between orbital height, orbital width and orbital index with transverse diameter of head.

The diameter of orbit can increased due to age, but after 70 years old the diameter start to decrease due to bone shrinking.

The orbital index higher in females than males.

The orbital index higher in Sudanese than other previous studies.

## ملخص الدراسة

توصيف المحاجر لدى السودانيين باستخدام الأشعة المقطعية المحوسبة يساعد على فهم التركيب التشريحي للمحجر و الذي يساعد في العمليات الجراحية لعظام الوجه.

اهداف الدراسة قياس قطر المحجر وربط هذه القياسات مع عرض الرأس و العمر.

تصميم الدراسة تم قياس عرض المحجر و طول المحجر و فهرس المحجر و عرض الحجاجين و العرض بين الحجاجين و عرض الرأس (ملم)، وقد اجريت الدراسة في مركز المدرس الطبي بالخرطوم.

ملم، متوسط طول المحجر (33.682) ملم ، متوسط نتائج الدراسة أن متوسط عرض المحجر (37.22) ملم ، متوسط العرض بين الحجاجين فهرس المحجر (91.01) ملم ، متوسط عرض الحجاجين (95.918) ملم و ملم، و متوسط عرض الرأس (133.09) ملم. متوسط فهرس المحجر للذكور (90.12) (24.444) ملم. للأناث (91.9)

وأظهرت الدراسة ايضا أن متوسط فهرس المحجر ( $89.5 \pm 4.173$ ) ملم في العمر ما بين (10-19) سنة ، ( $91.483 \pm 3.728$ ) ملم في العمر بين (20-29) سنة ، ( $91.085 \pm 6.076$ ) ملم في العمر بين (30-39) سنة ، ( $90.47143 \pm 4.064$ ) ملم في العمر بين (40-49) سنة ، ( $91.08571 \pm 3.044$ ) ملم في العمر بين (50-59) سنة ، ( $91.36364 \pm 2.990$ ) ملم في العمر بين (60-69) سنة ، ( $90.88 \pm 4.293$ ) ملم في العمر بين (70-79) سنة .

خلاصة الدراسة ان هنالك علاقة خطية بين عرض المحجر و طول المحجر و فهرس المحجر و عرض الحجاجين و العرض بين الحجاجين مع عرض الرأس .

وهناك ايضا علاقة خطية بين عرض المحجر و ارتفاع المحجر و فهرس المحجر مع العمر .

فهرس المحجر يزيد مع زيادة العمر لكنه يبدأ في التناقص بعد عمر 70 عاما نتيجة لتقلص العظم .

فهرس المحجر لدى الأناث اعلى من الذكور.

فهرس المحجر لدى السودانيين اعلى من باقى الدراسات السابقة



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