Dedication

- **To the sprit of my mother.**
- **To my father, the mean of learning how the life can go as better as it must be.**
- **To my best friends who did as possible as they can to give support and care.**
- **And to someone very special in my life, who is giving me an extra touch of joy to everything that I do, my Son, Maaz.**

.

Acknowledgements

My full thanks to my God in everything my great thanks and deep gratitude to my supervisor Mr. Hussein Ahmed Hassan for his advices, valuable suggestions and help.

Also very special thank extend to Mr. Abd El/Monem Adam, who helped in performing the practical part of this research, with his full patience and co-operative.

My thank to the staff of Khartoum Advance Diagnostic Centre (KADC) who gave me permission to conduct the practical part of this work in the centre.

Abstract

The aim of this study is to establish suitable protocols of magnetic resonance imaging for normal cranial nerves appearance because it is not feasible to follow their entire course within the brain due to their oblique direction and small size, beside that they are surrounded by cerebrospinal fluid, fat and blood vessels.

The study also aim to establish accurate landmarks for easy detection of these nerves.

The study visualized the normal anatomy of the cranial nerves in due to their excellent contrast with cerebrospinal fluid and the possibility of thin sections, so that these protocols might be essential for the diagnosis of neuroalgia and cranial nerves paralysis.

ملخص البحث

الهدف من هذه الدراسة هو وضع نظام (بيوتوكول) للتصوير بالرنين المغنطيسي لظهور الأعصاب الدماغية السليمة ، وذلك لأن هذه الأعصاب ليس من السهولة متابعة تكويناتها حتى النهاية داخل الدماغ نسبة لوضعها المائل وصغر حجمها ، مع إحاطتها بالسائل الدماغي النخاعي والدهون والأوعية الدموية.

وتهدف الدراسة أيضاً إلي إيجاد معالم وضعية صحيحة لاكتشاف تلك الأعصاب بصورة سهلة.

وقد أظهرت الدراسة الوضع التشريحي الطبيعي للأعصاب الدماغية وذلك بإجراء مقاطع رقيقة بالاستفادة من وجود تباين ممتاز بين الأعصاب الدماغية والسائل الدماغي ،ويمكن أن تعتبر هذه الطريقة التقنية مهمة لتشخيص حالات الشلل في الأعصاب الدماغية والعصبية.

List of Abbreviation

MRI	:	Magnetic resonance imaging
RF	:	Radio Frequency.
T	:	Tesla.
II	:	Second Cranial Nerve.
III	:	Third Cranial Nerve.
V	:	Fifth Cranial Nerve.
VII	:	Seventh Cranial Nerve.
VIII	:	Eight Cranial Nerve.
CN	:	Cranial Nerves.
CT	:	Computerized Tomography.
NMR	:	Nuclear Magnetic Resonance.
3D CISS :	:	3-dimensional Constructive Interference in Steady State.
3D Mp-RAGE	:	3-dimensonal magnetization prepared rapid gradient echo.
2D TSE	:	2-dimensional turbo spin echo.
IAC	:	Internal auditory canal.
CSF	:	Cerebrospinal fluid.
MS	:	Multiple sclerosis.
KADC	:	Khartoum Advance Diagnostic Centre.
ToF	:	Time of Flight.
MpR	:	Multi planar Reformat.
TR	:	Time to Repetition.
TE	:	Time to Echo.
FOV	:	Field of View.

NEX	:	Number of averages.
FFE	:	Fast field echo.
WI	:	Weighted imaging..

List of Contents

Topic No **Page**

Chapter Three: Material and Methods

Chapter Four