CEREBRAL ANEURYSM C.T. AND M.R.I.

Thesis

Submitted For Partial Fulfillment Of Master Degree In Radiodiagnosis

By Hazem Fawzy Abou El-Hamayed

Inpervised by Prof. Dr. Salwa Taha Ahmed Ismail

Prof. of Radiodiagnosis Faculty of Medicine Ain Shams University

Dr. Mounir Sobhy Guirguis

Lecturer of Radiodiagnosis

 Faculty of Medicine
 Ain Shams University

FACULTY OF MEDICINE AIN SHAMS UNIVERSITY 1998 of the order of th





Acknowledgment

With great pleasure, I would like to express my sincere gratitude and appreciation to professor **Dr**. **Salwa Taha Ahmed Ismail**, Professor of Radiodiagnosis, Faculty of Medicine, Ain Shams University, for her generous help, patience, consideration, encouragement and careful review of all the details of this work.

I owe special gratitude to **Dr. Mounir Sobhy Guirguis**, Lecturer of radiodiagnosis, Faculty of
Medicine, Ain Shams University, for his resourceful
knowledge, close supervision and continuous advise
were the best guide to me during the different stages of
this work.



INDEX

Part	Contents	Page
I	Introduction and aim of work	1
II	Anatomical consideration	2
III	Pathology of cerebral aneurysms	26
IV	Clinical approach of cerebral aneurysms	31
V	Technical consideration	34
VI	Manifestations of cerebral aneurysms with	49
-	illustrative cases	
VII	Summary and conclusion	71
VIII	References	73
IΧ	Arabic summary	

List of figures

Fig.		Page
1	Circle of Willis	3
2	Diagram of Circulus arteriosus	3
3	Blood supply of medial surface of	
	cerebral hemisphere	6
4	Blood supply of superolateral surface of cerebral hemisphere	7
5	Blood supply of inferior surface of	/
_1	cerebral hemisphere	9
6	Veins of the superolateral surface of	
V)	cerebral hemisphere	10
7	Lateral view of arterial phase of ICA	• •
	angiography	1+
8	A.P. view of arterial phase of ICA	
	angiography	15
()	Venous phase of ICA angiography	16
10	Arterial phase of vertebral angiogram,	
	A.P. view	17
1)	Arterial phase of vertebral angiogram,	
	lateral view	18
12	Normal C.T. appearance of cerebral	19
	arteries.	
13, 14	Normal C.T.A. of cerebral arteries	20
15	Normal MRA of cerebral vessels, Axial	
	T ₂ WI	22
16	Circle of Willis, Axial T ₂ WI	22
17	Deep venous pathways in T ₂ W1	23
18	Arteries of neck and brain in coronal	24
	MRA	



	List Of S	Figures
19	Circle of Willis in MRA	25
20	Common sites of berry aneurysms	28
21	Acute subarachnoid hemorrhage in	
	conventional C.T	51
22	Patent aneurysm in conventional C.T	52
23	Partially thrombosed aneurysm in	
	conventional C.T.	53
24	Partially thrombosed aneurysm in	
	conventional C.T.	54
25	Subarachnoid Hemorrhage and C.T.A	55
26	Middle cerebral artery aneurysm in MRI.	56
27	Bilateral giant carotid aneurysms in	
	MRA	58
28	Schematic diagram of partially	
	thrombosed aneurysm in MRI	59
29	Partially thrombosed aneurysm in MRI	59
30	Basilar tip aneurysm, MRI and MRA	61
31	Acute subarachnoid Hge. in C.T. and	
	MRI	62
32	Anterior communicating artery aneurysm	
	in MRA	64
33	Fusiform aneurysms in anterior and	
	posterior circulations	65
34	Giant cavernous carotid aneurysm in MRI	
	and MRA	66
35	Anterior communicating artery aneurysm	
	in CTA and MRA	69
36	Calcification in large aneurysms CTA &	
	MRA	70



List of Abbreviations

 A_1 A_1 , segment of anterior cerebral artery

 A_2 A₂ segment of anterior cerebral artery

CSF Cerebrospinal fluid

C.T. Computerized tomography

C.T.A. Computerized tomographic angiography

DSA Digital subtraction angiography

2D Two dimensional3D Three dimensional

FSE Fast spin echo
Gd. Gadolinium

GRE Gradient recalled echo ICA Internal carotid artery.

M₁, M₂, M₃ Segments of middle cerebral artery
 MRA Magnetic resonance angiography.
 MRI Magnetic resonance imaging

 P_1 P₁ segment of posterior cerebral artery

PCA Phase contrast angiography PCOM Posterior communicating artery

PD Proton density RF Radio frequency

SE Spin echo

SMRA Selective magnetic resonance angiography

 T_1WI T_1 weighted image T_2WI T_2 weighted image

TE Echo time
TOF or TF Time of flight.
TR Repetition time

VENC Velocity - encoding value