



بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ



شبكة المعلومات الجامعية

جامعة عين شمس

التوثيق الإلكتروني والميكروفيلم

قسم

نقسم بالله العظيم أن المادة التي تم توثيقها وتسجيلها
على هذه الأقسام قد أعدت دون أية تغييرات



يجب أن

تحفظ هذه الأقسام بعيدا عن الغبار

في درجة حرارة من ١٥-٢٥ مئوية ورطوبة نسبية من ٢٠-٤٠%

To be Kept away from Dust in Dry Cool place of
15-25- c and relative humidity 20-40%



شبكة المعلومات الجامعية التوثيق الالكتروني والميكرو فيلم



بعض الوثائق الأصلية تالفة

بالرسالة صفحات لم ترد
بالأصل

Cerebrospinal Fluid Flow Measurements Using MR Imaging In Hydrocephalus

Essay submitted for partial fulfillment of master degree.

Presented by:

Mohamed Mohamed Fadel

Supervised by:

Dr: Ahmed Mohamed Monib

Ass. Prof. of Radiology

Radiology Department Ain Shams University

Dr: Magdy Gad-Allah Aly

Lecturer of Radiology

Radiology Department Ain Shams University

Dr: Ahmed Diaa-Eldin Tantawy

Lecturer of Neurosurgery

Neurosurgery Department Ain Shams University

122
Ain Shams University



Acknowledgement

I wish to express my great indebtedness and deep gratitude to

Ass. Prof. Dr. Ahmed Mohamed

Monib

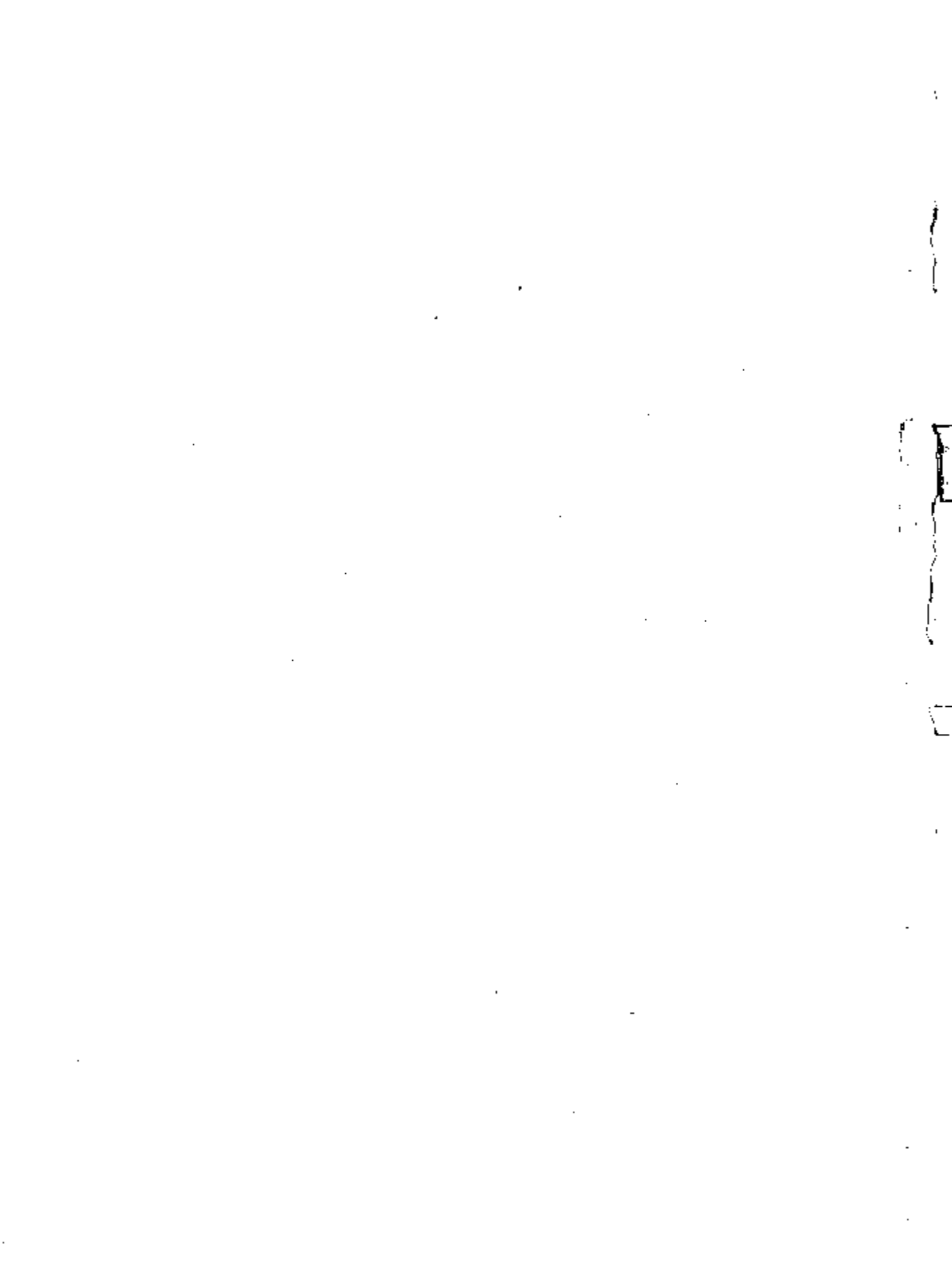
Assistant Professor of Radiodiagnosis, Ain Shams University, for his valuable guidance and great help in supervising this work. No words can express my feelings, respect and gratitude to him as regards his continuous encouragement and constructive criticism given to me at every stage of this work.

I also extend my thanks and appreciation to

Dr. Magdy Gadallah

Lecturer of Radiodiagnosis, Ain Shams University

I



**Dr. Ahmed Diaa-Eldin
Tantawy**

Lecturer of Neurosurgery, Ain Shams University

*For accepting the idea of this work, his kind assistance, and
efforts, which helped me in accomplishing this Essay.*

Contents

No.	Chapter	Page
I.	Introduction and aim of work	2
II.	Anatomy and physiology	3
III.	Pathology and pathogenesis	34
VI.	Review of literature	47
	&	
	Discussion	76
VII.	Summary and conclusions	95
VIII.	References	99
IX.	Arabic summary	

List of Figures

No.	Description	Page
1 - 1 A	Cast of cerebral ventricles	4
1 - 2 A	Fig. show the ventricular system	10
1 - 3 A	Dural maters and subarachnoid space	18
1 - 4 A	Choroid plexus and CSF circulation	19
1 - 5 A	Choroid plexus as a source of CSF motion (old theory)	22
1 - 6 A	CSF motion due to brain pulsation (recent theory)	23
1 - 7 A	Greitz and Greitz's theory on the pathogenesis of hydrocephalus.	24
1 - 1 B	Sagittal T ₁ weighted image of the brain show the ventricular system	28
1 - 2 B	Coronal T ₂ weighted image of the brain show the ventricular system	29
1 - 3 B	Coronal T ₂ weighted image of the brain show the ventricular system	30
1 - 4 B	Axial T ₂ weighted image of the brain show the ventricular system	31
1 - 5 B	Axial T ₂ weighted image of the brain show the ventricular system	31
1 - 6 B	Axial T ₂ weighted image of the brain show the ventricular system	32
4 - 1	obstructive hydrocephalus (acute type) markedly enlarged ventricles with surrounding interstitial edema .	51
4 - 2	Normal pressure hydrocephalus (NPH) (chronic). demonstrates ventricular	52

	enlargement out of proportion to any cortical sulcal enlargement, confirming the presence of normal pressure	
4 - 3 A	Normal midsagittal spin-echo T1-weighted MR image of the brain (400/12 [TR/TE]).	57
4 - 3 B	Schematic representation of the parameters assist in Morphometric Study of the Midsagittal MR Imaging of the brain.	58
4 - 4 A	Hydrocephalus secondary to aqueductal stenosis. A, Spin-echo T1-weighted image at 400/12. There is clockwise rotation of the chiasm, the mammillopontine distance is decreased, the mammillocommissural distance is increased, and the third ventricular floor is concave with consequent counterclockwise rotation of its line.	59
4 - 4 B	B, Hydrocephalus secondary to aqueductal stenosis following endoscopic third ventriculostomy.	59
4 - 5	Quantification of CSF flow void	71
4 - 6	CSF velocity imaging (sagittal technique) Cine phase contrast	72
4 - 7 A	Aqueductal stenosis due to presumed benign tectal glioma. Sagittal midline contrast-enhanced T1-weighted image [(SE	93