

DIAGNOSTIC MEDICAL IMAGING OF THE ADRENAL GLAND

Essay

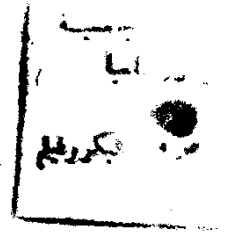
Submitted for Partial Fulfilment of
Master Degree of Radiodiagnosis

By

Sherif Hamed Abou-Gamrah

M.B.; b. Ch

Ain Shams University



616 0757
Sh. H

Supervised

Prof. Dr. Abd-El Zaher Ali Hassan

Professor of Radiodiagnosis

Faculty of Medicine

Ain Shams University

616 0757

Faculty of Medicine

Ain Shams Univeristy

1995







DEDICATION

*To
My
Family*



ACKNOWLEDGMENT

With my greatest pleasure, I would like to express my gratitude and appreciation to Professor Dr. Abd El-Zaher Ali Hassan, Professor of Radiodiagnosis, Ain Shams University, for his generous help, patience, encouragement and careful supervision, his professional guidance and advisement.

I must also, express my appreciation to all the staff of Radiodiagnosis Department and my colleagues for their collaboration and valuable assistance.

Sheirf H. Abou Gamra

CONTENTS

I-	INTRODUCTION AND AIM OF THE WORK	1
II-	ANATOMY	3
III-	PATHOLOGY	11
IV-	DIFFERENT MODALITIES IN IMAGING	
	THE ADRENAL GLANDS	28
V-	PLAIN X-RAY	32
VI-	C.T. (COMPUTED TOMOGRAPHY)	35
VII-	M.R.I. (MAGNETIC RESONANCE IMAGING)	65
VIII-	RADIOISOTOPE SCANNING	82
IX-	ULTRASONOGRAPHY	94
X-	ANGIOGRAPHY	115
XI-	ILLUSTRATIVE CASES	123
XII-	CHOICE OF THE INVESTIGATION	136
XIII-	SUMMARY AND CONCLUSION	140
XIV-	REFERENCES	142
XV-	ARABIC SUMMARY	153

List of Figures

- Fig. 1 : Normal anatomy of adrenal glands
- Fig. 2 : Arterial supply of the adrenals
- Fig. 3 : Venous drainage of the adrenals
- Fig. 4 : Calcified adrenals in a child
- Fig. 5 : Drawing of transverse section of the upper abdomen
- Fig. 6 : Normal adrenal gland
- Fig. 7 : A range of different shapes of the adrenals
- Fig. 8 : Calcified non-functioning adrenal tumors
- Fig. 9 : Right adrenal carcinoma
- Fig. 10 : Right adrenal carcinoma
- Fig. 11 : A 3 years old boy with neuroblastoma
- Fig. 12 : Large non calcified neuroblastoma
- Fig. 13 : Adrenal & renal cysts
- Fig. 14 : A large right adrenal cyst.
- Fig. 15 : Myelolipoma of left adrenal gland
- Fig. 16 : Right adrenal myelolipoma
- Fig. 17 : Right adrenal pheochromocytoma
- Fig. 18 : Multiple endocrine adenomatosis
- Fig. 19 : Adrenal gland hyperplasia
- Fig. 20 : Cushing syndrome of left adrenal adenoma
- Fig. 21 : Cushing's adenoma
- Fig. 22 : Variation in density of aldosteronomas

- Fig. 23 : Non functioning adrenal tumour
- Fig. 24 : Enormous bilateral adrenal metastases
- Fig. 25 : CT directed aspiration needle biopsy
- Fig. 26 : Adrenal gland histoplasmosis
- Fig. 27 : Histoplasmosis
- Fig. 28 : Acute hypoadrenalism 2^{ry} bilateral adrenal hemorrhage
- Fig. 29 : Adrenal gland hematoma
- Fig. 30 : Normal adrenal glands by M.R.I.
- Fig. 31 : Adrenal adenoma
- Fig. 32 : T2 weighted right adrenal mass
- Fig. 33 : Intra adrenal pheochromocytomas
- Fig. 34 : Intra adrenal pheochromocytomas
- Fig. 35 : Bilateral adrenal metastases
- Fig. 36 : Adrenal scintigraphy (normal study)
- Fig. 37 : Cortical adenoma of the right gland
- Fig. 38 : bilateral adrenal cortical hyperplasia
- Fig. 39 : bilateral adrenal hyperplasia
- Fig. 40 : Aldosterone producing left adrenal adenoma
- Fig. 41 : Pheochromocytoma
- Fig. 42 : Large right pheochromocytoma
- Fig. 43 : Neuroblastoma
- Fig. 44 : Method of scanning adrenal areas
- Fig. 45 : Scanning technique affecting the demarcation between
adrenal mass & kidney.

- Fig. 46 : Normal adrenal glands (U/S)
- Fig. 47 : Ultrasound scan shows a large irregular mass (adrenal carcinoma)
- Fig. 48 : Ultrasound scan shows large rounded tumour
- Fig. 49 : A calcified cyst in the right adrenal gland
- Fig. 50 : Aldosteronoma
- Fig. 51 : Unilateral pheochromocytoma
- Fig. 52 : Cystic pheochromocytoma
- Fig. 53 : A right adrenal pheochromocytoma
- Fig. 54 : Bilateral adrenal metastases
- Fig. 55 : A metastatic left adrenal mass
- Fig. 56 : Conn's-tumor (phlebogram)
- Fig. 57 : Large Conn's-tumor (phlebogram)
- Fig. 58 : Pheochromocytoma
- Fig. 59 : Large vascular pheochromocytoma
- Fig. 60 : A right adrenal adenoma causing cushing's syndrome.
- Fig. 61 : Bilateral pheochromocytoma
- Fig. 62 : Close up to fig. 61.
- Fig. 63 : Left adrenal mass with cushing's syndrome
- Fig. 64 : Multiple endocrine adenomatosis II
- Fig. 65 : Aldosterona producing adenoma
- Fig. 66 : Adenome of the left adrenal gland
- Fig. 67 : Adenoma
- Fig. 68 : Adrenal insufficiency 2^{ry} to tuberculosis

