

OK on book

LIPIODOL ENHANCED CT SCANNING IN ASSESSMENT OF HEPATOCELLULAR CARCINOMA

THESIS
SUBMITTED FOR PARTIAL FULFILLMENT
FOR M.D. Degree In General Medicine

By
Amal Mohamed El Sadek Mohamed
M.B.B. Ch, M. Sc

Supervised By
Prof. Dr. Anwar abd El Mohsen
*Prof. Of Internal Medicine
Faculty of Medicine
Ain Shams University*

58381

Dr. Salwa Ibrahim El Haddad
*Prof. of Pathology
Faculty of Medicine
Ain Shams University*

Dr. Abd El Fatah Abd El Salam
*Prof. of Internal Medicine
Faculty of Medicine
Ain Shams University*

Dr. Omar Hussein Omar
*Prof. of Radiology
Faculty of Medicine
Ain Shams University*

Dr. Mohamed A. H. El Bold
*Prof. of Internal Medicine
Faculty of Medicine
Ain Shams University*

Faculty of Medicine
Ain Shams University
1999



بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

وقل رب زدني علماً

صدق الله العظيم

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60
61
62
63
64
65
66
67
68
69
70
71
72
73
74
75
76
77
78
79
80
81
82
83
84
85
86
87
88
89
90
91
92
93
94
95
96
97
98
99
100

LIPIODOL ENHANCED CT SCANNING IN ASSESSMENT OF HEPATOCELLULAR CARCINOMA

THESIS
SUBMITTED FOR PARTIAL FULFILLMENT
FOR M.D. Degree In General Medicine

By
Amal Mohamed El Sadek Mohamed
M.B.B. Ch, M. Sc

Supervised By
Prof. Dr. Anwar abd El Mohsen
Prof. Of Internal Medicine
Faculty of Medicine
Ain Shams University

Dr. Salwa Ibrahim El Haddad
Prof. of Pathology
Faculty of Medicine
Ain Shams University

Dr. Abd El Fatah Abd El Salam
Prof. of Internal Medicine
Faculty of Medicine
Ain Shams University

Dr. Omar Hussein Omar
Prof. of Radiology
Faculty of Medicine
Ain Shams University

Dr. Mohamed A. H. El Bokl
Prof. of Internal Medicine
Faculty of Medicine
Ain Shams University

Faculty of Medicine
Ain Shams University
1999

Acknowledgment

For all my supervisors, I'd like to express my deepest gratitude for their harmony work and kind directions.

*Much dignity for **Prof. Dr. Anwar Abd El-Mohsen** for his fine encouragement, direful experience and best guidance all through this work.*

*All my thanks for **Prof. Dr. Abd El-Fattah Abd El-Salam** for his sincere work, enormous effort and support .*

*For **Prof. Dr. Mohamed A. H. El-Bokl**, I offer all my honor for his grand attention and fruitful revision.*

*I want to express also my deep feelings for **Prof. Dr. Salwa Ibrahim El-Haddad** for her pleasant assistance, glowing and faithful role.*

*I'm also grateful for **Prof. Dr. Omar Hussein Omar** and acknowledge him for his helpful role and kind care.*

*My deepest gratitude for **Prof. Dr. Ahmed Kamal El-Dorry** for his elegance work and kind assistance.*

*For **Prof. Dr. Mohamed Abd Ghani**, I want to offer him a gift full of thanks for his assistance.*

CONTENTS

<i>Subject</i>	<i>Page</i>
Part I : Introduction	1
Part II : Review of literature	3
Chapter I: Physioanatomic considerations of the liver	3
I-1 Gross anatomy of the liver.	3
I-2 Micro anatomy of the liver.	15
Chapter II : Focal Hepatic lesions.	18
I. Neoplastic Lesions.	22
II. Non-Neoplastic lesions.	34
Chapter III : Hepatic focal lesion Differentiation	
By different Radiological techniques	40
A: Ultrasonographic Examination.	40
B : Computed Tomographic Examination.	54
C : Magnetic Resonance Imaging.	67
D : Radionuclide imaging of the liver.	84
Chapter IV : Lipiodol - enhanced CT scanning in	
assessment of HCC	97
I. Historical background.	97
II. Biodistribution of Lipiodol.	97
III. Postulated mechanisms of Lipiodol retention in	
tumours.	98
IV. use of Lipiodol in diagnostic imaging.	102
Part III : Patients and Methods.	114
Part IV : Results.	132
Part V : Discussion.	198
Part VI: References.	215
Part VII : Summary and conclusion.	246
Part VIII: Arabic Summary.	248

List of Tables

Table I	Focal hepatic lesions
Table II	Staging of Hepatic tumours.
Table III	Differential Diagnosis of liver lesion signal Intensity.
Table IV	Differential Diagnosis of hepatic tumours by Morphologic Criteria.
Table V	Criteria for grading Lipiodol retention in liver tumours.
Table (1)	Some clinical features of patients under study.
Table (2)	Age frequency of HCC
Table (3)	Sex distribution of HCC.
Table (4)	Relation between HCC and serum transaminases.
Table (5)	Relation between HCC and Hepatitis markers.
Table (6)	Correlation between AFP and tumour size.
Table (7)	Correlation between AFP and number of Focal lesions.
Table (8)	Correlation between different types of histopathological diagnosis and AFP.
Table (9)	Detection rates of various imaging techniques for HCC as regards the size of lesions.
Table(10)	Detection rates of various imaging techniques for HCC as regards the multiplicity of lesions.
Table(11)	Lipiodol-CT versus conventional CT in detection of HCC lesions as regards the size of lesion.
Table(12)	Lipiodol -CT versus DSA in detection of HCC lesions as regards the size of lesion.
Table(13)	Lipiodol-CT versus DSA in detection of HCC lesions as regards the size of lesion.
Table(14)	Lipiodol-CT versus ultrasound in detecting multiple HCC lesions.
Table(15)	Lipiodol-CT versus conventional CT in detecting multiple HCC lesions.
Table(16)	Lipiodol-CT versus DSA in detecting multiple lesions of HCC.
Table(17)	Relation between the histologic grading of HCC and tumour size detected by Lipiodol angiography.
Table(18)	Master table for collected data.

List of Figures

- Figure (1)** *Liver fissures, lobes & segments.*
- Figure (2)** *Segmental anatomy of the liver.*
- Figure (3)** *Cobra and selective femorovisceral catheters.*
- Figure (4)** *Technique of angiography.*
- Figure (5)** *Radiological findings in group I.*
- Figure (6)** *Radiological findings in group II*
- Figure (7)** *Correlation bet. AFP & Tumour size*
- Figure (8)** *Correlation bet AFP & number of focal lesions in all patients.*
- Figure (9)** *Correlation bet different types of histopath. Diagnosis and AFP in HCC patients.*
- Figure (10)** *Detection rates of variuos imaging techniques for HCC as regards the size of lesion.*
- Figure (11)** *Relation between the histologic grading of HCC and tumour size detected by lipiodol angiography.*
- Figures (12-24)** *Radiological Pictures comparing conventional CT with Lipiodol CT in some of the cases as examples.*
- Figures (25-30)** *Pictures for the histopathological examination of liver biopsies showing the characters of HCC and its three grades.*

List Of Abbreviation

Abbr.	The name
AFP.	Alpha fetoprotein
CNR	Contrast to Noise Ratio
CSF	Cerebro spinal fluid.
CT	Computerized Tomography
CTAP	CT Arterial portography
DSA	Digital subtraction Angiography.
FNH	Focal Nodular hyperplasia
Gd-DTPA	Gadolinium dimethylene Triamine penta acetic acid
GRASS	Gradient recalled acquisition at steady state
H.U.	Housefield Units
HA	Hepatic artery
HBV	Hepatitis B Virus
HCC	Hepato cellular Carcinoma
HCV	Hepatitis C Virus
IOCT	Iodized oil CT.
IR	Inversion recovery .
MRI	Magnetic Resonance Imaging
NRH	Nodular regenerative hyperplasia
OLT	Orthotopic liver transplantation
PEI	Percutaneous ethanol injection
PV	Portal Vein
SE	Spin-echo
SNR	Signal to-noise-ratio
SPECT	Single photon emission computed tomography
TACE	Transcatheter arterial chemoembolization
TE	Time Echo
TR	Time Repetition
U/S	Ultrasonography.



