

شبكة المعلومات الجامعية







شبكة المعلومات الجامعية التوثيق الالكتروني والميكروفيلم



شبكة المعلومات الجامعية

جامعة عين شمس

التوثيق الالكتروني والميكروفيلم

قسم

نقسم بالله العظيم أن المادة التي تم توثيقها وتسجيلها على هذه الأفلام قد أعدت دون أية تغيرات



يجب أن

تحفظ هذه الأفلام بعيدا عن الغبار في درجة حرارة من ١٥-٥٠ مئوية ورطوبة نسبية من ٢٠-٠٠% To be Kept away from Dust in Dry Cool place of 15-25- c and relative humidity 20-40%



بعض الوثائـــق الإصليــة تالفــة



بالرسالة صفحات لم ترد بالإصل

Magnetic Resonance Imaging In Gastrointestinal Surgery

Essay
Submitted in partial fulfillment for the M.Sc. degree in
General surgery

B4941

By

Abdoraboh El-Sayed M.M. (MB.B.Ch.)

Supervisors

Prof. Dr. FAKHERY HAMED EBIED

Prof. of General Surgery Faculty of Medicine Ain Shams University

Prof. Dr. JANNETTE BOUSHRA HANNA

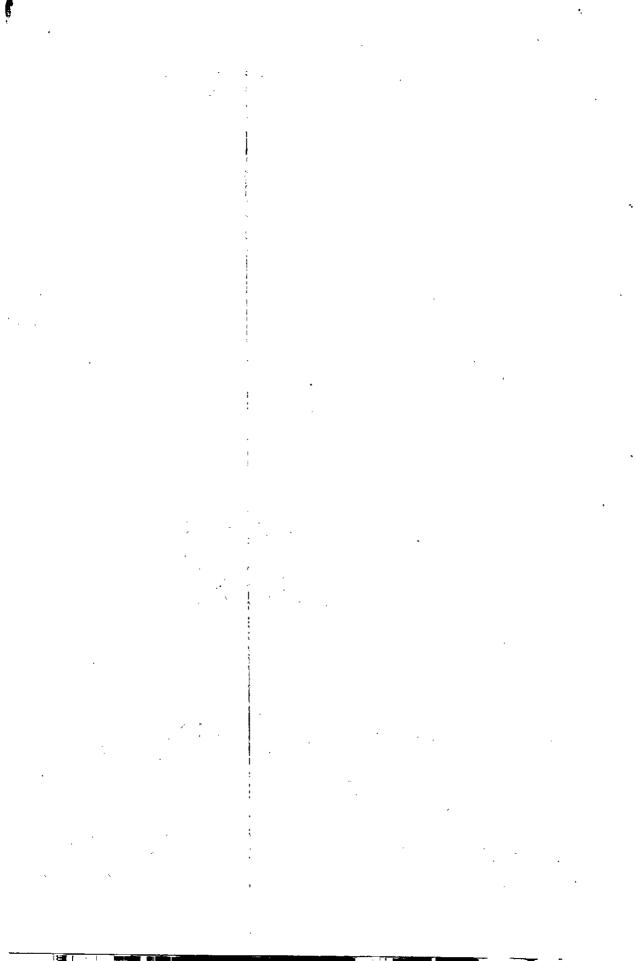
Prof. of Radiodiagnosis
Faculty of Medicine
Ain Shams University

Prof.Dr. KHALED A. AUF

Prof. of General Surgery
Faculty of Medicine
Ain Shams University

Faculty of Medicine
Ain Shams University

2001



ACKNOWLEDGEMENT

First and formost, thanks are due to Allah, the beneficient and merciful:"

No words of thanks or gratitude are sufficient to my Professor Doctor Fakhery H. Ebied, Professor of General Surgery, Faculty of Medicine, Ain Shams University, who inspired in me the spirit of research and serious scientific work by his fruitful advices throughout this work.

I would like to express my deepest gratitude and sincere appreciation to Professor Doctor Jannette B. Hanna, Professor of Radiodiagnosis, Faculty of Medicine, Ain Shams University, for her wise guidance, her continuous encouragement, meticulous supervision and valuable assistance at every step in this work.

Special thanks are due to Professor Doctor Khaled A. Auf, Professor of General Surgery, Faculty of Medicine, Ain Shams University, for his gentle, kind constant guide and his tremendous help and support.

Also, thanks are due to the technicians and all members of the department of radiodiagnosis, Faculty of Medicine, Ain Sham University for their great help to complete is work.

Abdoraboh

	nte	4
1 0	nte	ntc
\mathbf{v}	\mathbf{n}	11 (3

	Contents	4 -
*	List of diagrams	Page [
. *	List of figures	Ш
*	List of abbreviations	IIV
*	Introduction and the aim of the work.	1
*	Physical principles of magnetic resonance imaging	2
*	Advantages & disadvantages of MRI	17
*	Historical background of magnetic resonance imagir	ig 19
*	Safety and hazards	21
*	Surgical anatomy of gastrointestinal system	26
*	Technique of MRI examination for the abdomen	58
*	MRI of the liver	60
*	MRI of the pancreas	69
*	MRI of the spleen	77
*	MRI of the gastrointestinal tract	80
*	Magnetic resonance cholangiopancreatography (MRC	CP) 85
*	Interventional magnetic resonance imaging	92
*	Summary & Conclusion	106
. *	References	112
*	Arabic summary	

List of Diagrams

- 1- Magnetic properties of the proton
- 2- Random orientation of the magnetic dipoles.
- 3- Alignment of the magnetic dipoles
- 4- Basic MRI experiment
- 5- MRI Pulse cycle
- 6- The image contrast determined on T1-weighted images
- 7- The image contrast determined on T2-weighted images
- 8- The three constriction of the oesophagus
- 9- Blood supply of the oesophagus.
- 10- Venous drainage of the oesophagus
- 11- Fundus, body, antrum, cardia of the stomach and duodenum
- 12- Disposition of the omentum & lesser sac, access to lesser sac.
- 13- Arterial blood supply of the stomach & proximal duodenum
- 14- Lymphatic drainage of the stomach
- 15- Ilecocoecal peritoneal folds and recesses
- 16- Arterial supply of the colon
- 17- Venous drainage of the colon
- 18- Rectum & anal canal, musculature internal structures and blood supply, coronal section
- 19- Anteriror & posterior surfaces of the liver, and peritoneal attachment
- 20- Segmental anatomy of the liver

Porta hepatis and visceral surface of the liver 21-Lobes and segments of the liver 22-Suprahepatic and subhepatic spaces 23A-The potential suprahepatic and subhepatic spaces 23B-The bile ducts and pancreatic duct system 24-Anomalies of the bile ducts and related arteries 25-The five parts of the pancreas 26-Variations of the pancreatic ducts & degrees of 27suppression of the a accessory ducts Variations of the pancreatic ducts & degrees of 28suppression & degree of segments of the main duct. The major arterial supply of the pancreas, anterior 29view The venous drainage of the pancreas, anterior view 30-The lymplatic drainage of the pancreas 31-The peritoneal folds attached to the spleen and their 32contained blood vessels Curve of enhancement of MRI in pancreatic 33-

transplant.

34-

Open MIR configuration

List of Figures

- 1- Stomach and omenta, anterior view
- 2- Portal venous system
- 3- Anal sphincters and anal canal
- 4- Arterial supply of the rectum and anal cancal
- 5- Normal MRI anatomy of the liver and adjacent organs.
- 6- Axial MRI of liver cysts
- 7- MRI of hepatic cavernous hemangioma,(A-C)
- 8- MRI of hepatic carernous hemangioma, (A,B)
- 9- MRI of giant hepatic hemangioma: (A-F)
- 10-MRI of hepatic adenoma (A-E).
- 11- MRI of hepatocellular carcinoma (A-F)
- 12-MRI of focal nodular hyperplasia (A-D)
- 13- Pericholecystitis, CT & MRI
- 14-MRI of liver metastases, (A-D).
- 15-MRI liver abscess CT & MRI (A-C).
- 16-Candidiasis, A: MRI, B: CT Scan
- 17-MRI: Hemochromatosis with thrombosis of the right main portal vein
- 18-A: cornal MR angiogram, portal hypertension with oesophageal varices and splenoremal shunts
 - B: Axial MR angiogram, portal hypertension with splenorenal shunt and patent parumbilical vein .
- 19-Axial MRI, sever liver cirrhosis.
- 20-Normal Pancreas, CT Scan
- 21-Infected pancreatic pseudocyst and associated with gastric volvulus.
- 22- MRI of microcystic adenoma in the body of the pancreas
- 23-MRI of mucinous cystadenocarcinoma in the tail of the pancreas
- 24-MRI of pancreatic duct carcinoma.(A,B)
- 25- CT with contrast and MRI of multiple endocrine neoplasia, the body of pancreas.
- 26-MRI of pancreatic cancer.

- 27-MRI of the normal spleen following IV gadolinium administration.
- 28-MRI of large splenic cyst.
- 29- MRI of multiple gamma gandy bodies in a patient with sever hemosiderosis and liver cirrhosis.
- 30-(A) Normal cornal MRI of the pelvis. (B,C) Normal sagittal MRI of the pelvis.
 - (D) Transverse MRI of the rectum.
- 31-Transaxial MRI of the pelvis
- 32-(A) Sagittal MRI through the pelvis
 - (B) coronal MRI of the same patients
- 33-Transaxial MRI through a mass lession in the rectum.
- 34-Choledocholithiasis, single shot MRCP
- 35- Anatomic variant of the biliary tract, single shot MRCP
- 36- Anomalous union of the pancreatobiliary ducts, single shot MRCP
- 37-Choledochal cyst with malignant degeneration, A : ERCP, B: MRCP.
- 38- Recurrence of cholangiocarcinoma, A: PTC, B: MRCP
- 39-Early cholangiocarcinome, single shot MRCP.
- 40-Early carcinoma of the papilla of vater, single shot MRCP
- 41- Pancreatic divisum, single. shot MRCP
- 42-Chronic pancreatitis, MRCP
- 43-Chronic pancreatitis, MRCP
- 44-Chronic pancreatitis, MRCP (MIP)
- 45- Pancreatic carcinoma, single shot MRCP

List of Abbreviation

CNS central nervous system CSF cerebrospinal fluid

CT Computed tomography

dB decibel

3D 3 dimentonal

EBD tube The endoscopic biliary drainage tube

ECG electrocardiogram
EPI echoplanar imaging

ERCP endoscopic retrograde cholangiography

ETL echo train length
FID Free induction decay

FISP fast imaging steady state precession

FLASH fast low- angle short

FNH focal nodular hyperplasia

FUS focused high energy ultrasound

FS fat saturation

FSE fast spin echo pulse sequence

Gd-DTPA gadolinium diethylene triaminepentaacetic acid

GRASS gradient recalled acquisition in the steady state

GRE gradient echo – pulse sequence

HASTE half-Fourier acquisition single shot tubo spin echoe.

HCC Hepatocellular carcinoma

IR Inversion recovery pulse sequence

ITT interstitial laser therapy

IV intravenous

LEDs light emitting diodes

MIOPs magnetic iron xide particles.
MIP maximum intensity projection.

Mn DPDP Manganese dipyridoxyl diphosphate

MPGR multiplanar GRASS MPR multiplanar reformat

MRA magnetic resonance angiography MRC magnetic resonance cholagiography

MRCP magnetic resonence cholangiopancreatography

MRI magnetic resonence imging

MRs magnetic resonance spectroscopy

ms millisecond