بسم الله الرحمن الرحيم

MONA MAGHRABY

شبكة المعلومات الجامعية

التوثيق الالكتروني والميكروفيلم

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شبكة المعلومات الجامعية

التوثيق الإلكتروني والميكروفيلم

جامعة عين شمس

التوثيق الإلكتروني والميكروفيلم

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Role of Susceptibility Weighted Images (SWI) in Grading of Brain Glioma

A Thesis

Submitted for Partial Fulfillment of M.D. Degree in Radio-Diagnosis

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Ayah Abdelaziz

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List of Abbreviations

Abb.	Full term
1p/19q	Short arm of chromosome 1"1p" & the long arm of chromosome 19 "19q".
1.5 T	1.5 Tesla
3T	3 Tesla
3D	Three dimensional
ATRX	Alpha thalassemia/mental retardation syndrome X-linked chromatin remodeler
CBV	Cerebral blood volume
CE-T1WI	Contrast enhanced T1WI
CNS	Central nervous system tumors
CSF	Cerebro-spinal fluid
CT	Computed tomography
DLGNT	Diffuse leptomeningeal glioneuronal tumour
DWI	Diffusion weighted imaging
FLAIR	Fluid-attenuated inversion-recovery
GBM	Glioblastoma multiforme
H3 K27 M	mutation gene encoding H3 histone variants
HP	High pass
HR-SWI	High resolution SWI
ICAs	Internal carotid arteries
IDH	Isocitrate dehydrogenase
IR	Inversion recovery
ITSS	Intratumoral susceptibility signals
Min IP/mIP	Minimum intensity projections images
MRI	Magnetic resonance imaging
NOS	Not otherwise specified
PXA	Pleomorphic xanthoastrocytoma
SE	Spin echo
SEGA	Subependymal giant cell astrocytoma

List of Abbreviations Cont...

Abb.	Full term

SNR.....Signal to noise ratio
SWI..... Susceptibility weighted imaging
T1WI.....T1 weighted image
T2WI.....T2 weighted image
TIM …… Total image matrix
TE …….. Echo time
TR …….. Repetition time
TP53 ..... Tumor protein p53
TSC …….. Tuberous Sclerosis complex
WHO..... World Health Organization

INTRODUCTION

Cerebral gliomas are the most common and devastating primary brain tumors. Although these tumors are traditionally considered to be arising from normal glial cells, the origin of the tumors remains undetermined. More recently, neural stem cells are proposed to be the source of glioma. The World Health Organization (WHO) published a classification system of central nervous system tumors (CNS) in 1979 and subsequently revised the system in 2000 and 2007 ***(Kao et al., 2013).*** In 2016 the WHO published a new classification system for brain glioma ***(Louis et al., 2016).***

The grading of gliomas mainly relies on histological features, including cellularity, nuclear atypia, mitotic activity, vascularity, and necrosis, observed on light microscopy with the aid of immunohistochemistry ***(Kao et al., 2013).***

Imaging plays a central role in diagnosis, characterization, surveillance and therapeutic monitoring of intracranial tumors. Magnetic resonance imaging (MRI) using T1 weighted image (T1WI), T2 weighted image (T2WI) and gadolinium enhanced sequences provides high resolution multiplanar structural information, and substantially improves tissue characterization compared with computed tomography (CT) ***(Upadhyay & Waldman, 2011).***