بسم الله الرحمن الرحيم

MONA MAGHRABY

شبكة المعلومات الجامعية

التوثيق الالكتروني والميكروفيلم

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جامعة عين شمس

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Role of MRI in Cerebral Venous Thrombosis

Thesis

Submitted for Partial Fulfilment of
M.S.c Degree in **Radio-Diagnosis**

By

Khaled Mostafa Mohammad Khaled
M.B.B.Ch.

Supervised by

Prof. Dr. Eman Ahmad Shawki Geneidi
Professor of Radio-diagnosis
Faculty of Medicine - Ain Shams University

Dr. Nermeen Nasry Keriakos
Lecturer of Radio-diagnosis
Faculty of Medicine - Ain Shams University

Faculty of Medicine
Ain Shams University
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Khaled Mostafa Mohammad Khaled

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List of Abbreviations

Abb.	Full term
3D	*Three-dimensional*
ADC	*Apparent diffusion coefficient*
CT	*Computed tomography*
CTA	*CT angiography*
CVST	*Cerebral venous sinus thrombosis*
CVT	*Cerebral venous thrombosis*
DICOM	*Digital Imaging and Communications in Medicine*
DSA	*Digital subtraction angiography*
DWI	*Diffusion weighted image*
GE	*Gadolinium enhanced*
ICV	*Internal cerebral vein*
ISS	*Inferior sagittal sinus*
MIP	*Maximum intensity projections*
MRI	*Magnetic resonance imaging*
MRV	*Magnetic resonance venograms*
NCE-MRV	*Non contrast enhanced MRV*
NSA	*Number of signals averaged*
OS	*Occipital sinus*
PC	*Phase contrast*
RF	*Radiofrequency*
RFOV	*Rectangular field of view*
SPSS	*Statistical software statistical package*
SS	*Straight sinus*
SSS	*Superior sagittal sinus*
TCD	*Transcranial Doppler ultrasound*
TE	*Echo time*
TOF	*Time-of-flight*
TR	*Repetition time*
TS	*Transverse sinus*

INTRODUCTION

Cerebral venous thrombosis CVT is a type of stroke where the thrombosis occurs in the venous side of the brain circulation, leading to occlusion of one or more cerebral veins and dural venous sinus ***(Ferro et al., 2017).***

CVT is a potentially life-threatening disease, accounting for approximately 0.5 % of stroke cases ***(Ozdemir et al., 2014).***

It is an uncommon cause of cerebral infarction relative to arterial disease but is an important consideration because of its potential morbidity and mortality ***(Ferro et al., 2002).***

CVT has a highly variable clinical presentation, from asymptomatic to acute or subacute headaches, signs or symptoms of increased intracranial pressure, focal neurologic deficits, or seizures ***(Linn et al., 2010).***

Accurate and prompt diagnosis of cerebral venous thrombosis is crucial, as timely and appropriate therapy can reverse the disease process and reduce the risk of acute and long-term sequelae ***(Bhagyavathi et al., 2017).***

Since the possible causal factors and clinical manifestations of thrombosis are many and varied requiring a high degree of suspicion, imaging plays a primary role in the diagnosis.

Over the last few years, innovations in radiological techniques have significantly improved the diagnosis and altered the management of this condition.

As the clinical presentation is highly variable, the diagnosis should be considered in young and middle-aged patients with recent unusual headache or with stroke-like symptoms in the absence of the usual vascular risk factors, in patients with intracranial hypertension, and in patients with CT evidence of hemorrhagic infarcts, especially if the infarcts are multiple and not confined to the arterial vascular territories. The average delay from the onset of symptoms to the diagnosis is seven days.

Both CT- and MR venography can confirm a diagnosis of cerebral venous thrombosis, but MR venography is probably more sensitive in the acute phase ***(Silvis et al., 2017; Ozsvath et al., 1997).*** MR venography also provides superior visualization of the brain parenchyma, venous infarcts and hemorrhages, and is thus the preferred imaging modality ***(Ferro et al., 2017).***

Venous infarcts occur in approximately 60 % of patients and differ from arterial infarcts in that they cross arterial boundaries. Almost two thirds of venous infarcts have a hemorrhagic component with significantly greater edema than in cases of arterial infarction ***(Silvis et al., 2017).***

The most sensitive examination technique is MRI in combination with magnetic resonance venography ***(Khandelwal et al., 2006).*** The combination of an abnormal signal in a sinus and a corresponding absence of flow on magnetic resonance venography confirms the diagnosis of thrombosis, but expert radiologic judgment is required to avoid diagnostic and technical pitfalls ***(Ayanzen et al., 2000).***

If MRI is not readily available, CT scanning is a useful technique for the initial examination, to rule out other acute cerebral disorders and to show venous infarcts or hemorrhages ***(Majoie et al., 2004).***