MR imaging of Lesions of the corpus callosum in adults and children

Thesis

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ABSTRACT

Background: a variety of entities that arise from different causes such as congenital, inflammatory, tumoral, degenerative, infectious, metabolic, traumatic, vascular and toxic agents. The corpus callosum, or a specific part of it, can be affected selectively.

Aim of the Work: The aim of this study is to emphasize the role of MRI modalities in the proper evaluation of the different pathological entities of the corpus callosum.

Patients and Methods: This study was conducted on 73 patients 37 male , 36 female , Their age ranging from one day old to 78 years old.

The study was done on a GE MRI machine 1.5 tesla in Ain shams university specialized Hospitals at the period between 2016 and 2019.

Images from the MRI studies were evaluated by two neuroradiologists

Results: our study revealed many pathological entities including inflammatory (42.5%), Vascular (26.0%), Congenital (15.1%), Tumoral (11.0%), Misc (2.7%), Metabolic (1.4%) and Infectious (1.4%) of Different callosal lesions.

Conclusion: Our data and in agreement with the previous studies has demonstrated that MRI is a valuable diagnostic tool for patients with corpus callosal lesions , utilizing contrast enhanced sequences as well as new MRI sequences such as Cube FLAIR , Spectroscopy , DTI and CSF flowmetry sequences . MRI has also shown to be useful and capable in the follow up of patients with demyelinating diseases with accurate depiction of the disease progression in space and in time (extent of the disease and stage of activity).

Key words: Corpus callosum , genu , splenium , multiple sclerosis , MRI , white matter , Multiple sclerosis , DAI

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INTRODUCTION

The corpus callosum is the largest white matter structure in the brain, consisting of 200–250 million contralateral axonal projections and the major commissural pathway connecting the hemispheres of the human brain. Each hemisphere is specialized in controlling movement and perception in the opposite half of the body, while also processing certain types of information (such as language or spatial patterns). **(Davidescu et al.,2013).**

The corpus callosum (CC) has four segments: the rostrum, genu, body and splenium; the narrowing between the body and splenium is called the isthmus .**(Santo et al ., 2012).**

The pathology of the corpus callosum includes a wide variety of entities that arise from different causes such as congenital, inflammatory, tumoral, degenerative, infectious, metabolic, traumatic, vascular and toxic agents. The corpus callosum, or a specific part of it, can be affected selectively. **(A Fitsiori et al., 2011).**

Fetal MR imaging is an increasingly available technique used to evaluate the fetal brain and spine. This is made possible by recent advances in technology, such as rapid pulse sequences, parallel imaging and advances in coil design. This provides a unique opportunity to evaluate processes that cannot be approached by any other current imaging technique and affords a

unique opportunity for studying in vivo brain development and early diagnosis of congenital abnormalities inadequately visualized or undetectable by prenatal sonography**. [Glenn And Barkovich, 2006]**

Anatomy of the corpus callosum has gained new interest in recent years owing to an increasing number of callosotomies performed to treat intraventricular lesions, as well as for the treatment of certain forms of generalized epilepsy. Furthermore, development of new techniques in MRI, such as diffusion tensor imaging (DTI), as well as evolution of older techniques permitting high-resolution imaging of the human brain, has enhanced interest in the study of specific brain structures and their correlation to clinical syndromes . **(Goncalves-Ferreira et al., 2001).**

Being the largest brain commissure, the corpus callosum is related to cognitive functions, social skills, problem solving, and attention. Thanks to its multi-planar nature and high tissue resolution magnetic resonance imaging is a method of choice in the assessment of the corpus callosum and its congenital and acquired pathological lesions. It is a perfect diagnosing tool from the very beginning of life, that is, from the prenatal period. Visualization of callosal involvement helps to establish diagnosis in certain disease entities**. (krupa et al ., 2013)**.

AIM OF THE WORK

The aim of this study is to emphasize the role of MRI modalities in the proper evaluation of the different pathological entities of the corpus callosum.