MRI APPEARANCE OF MULTIPLE SCLEROSIS IN The CENTRAL NERVOUS SYSTEM

ESSAY

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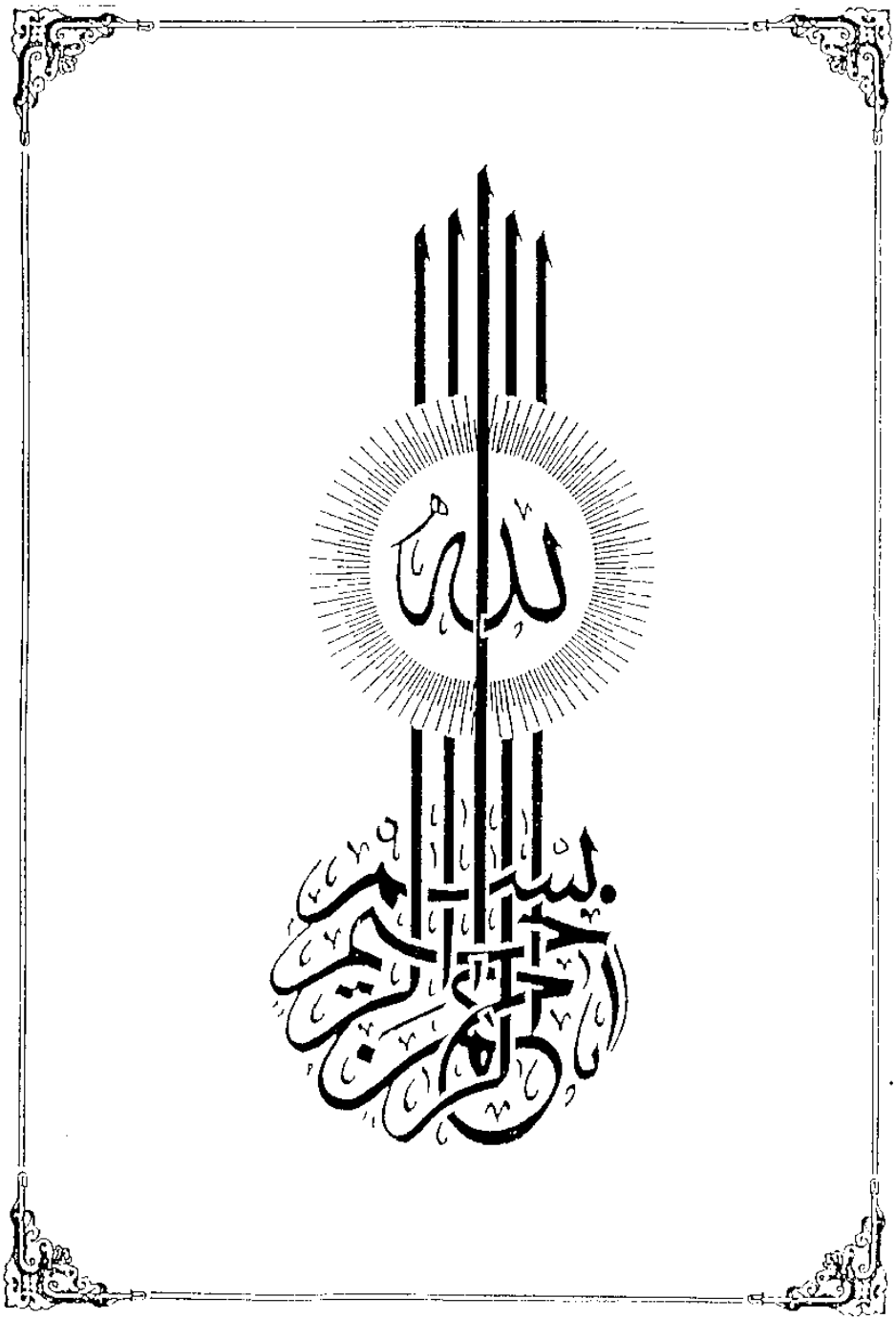

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Contents

Introduction And Aim Of Work

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Multiple sclerosis (MS) is an inflammatory demyelinating disorder and is the most common cause of neurologic disability in the young adult.

Magnetic resonance imaging (MRI) of the brain and spinal cord is more sensitive for the diagnosis of MS than are most paraclinical tests and examination of CSF. Also MRI has proved to be far superior to C.T in the diagnosis of MS due to its sensitivity to white matter changes and higher spatial resolution.

The purpose of our study is to determine specific MR imaging characteristics of the brain and spinal cord MS and to correlate these findings with available clinical and pathological parameters, also to make use of MRI as a measure of pathological disease activity and monitoring the efficacy of potential new treatment for MS.

MRI Anatomy Of The Brain, Spinal Cord, And Normal White Matter Appearance

Normal MRI Anatomy Of The Brain

Axial Sections :- (Fig. 1.1)

Six axial planes parallel to the canthomeatal line are presented. It is convenient to describe these planes in four levels (Gado et al., 1992).

1- The supraventricular level includes sections above the level of the lateral ventricles.

2- The high ventricular level includes those at the level of the body of the lateral ventricle.

3- The low ventricular level includes sections at the level of the basal ganglia and thalamus.

4- The infraventricular level includes those at the level below the thalamus, through the inferior parts of the frontal and temporal lobes.

Supraventricular Level (Fig. 1.2 and 1.3)

Examples of the supraventricular level include the sections situated 6 to 7 cm above the center of the external auditory meatus these sections do not contain parts of the lateral ventricles.

Rather, each hemisphere is represented by a central core of white matter called the centrum semiovale and a peripheral array of convolutions of gray matter. Each convolution (gyrus) contains an extension of the white matter in its center.

A higher plane in the supraventricular level transects the paracentral lobule on the medial surface of the cerebral hemisphere and a lower plane transects the cingulate gyrus. On the lateral surface, both sections transect the frontal gyri, the precentral and postcentral gyri (lines Ia and Ib in fig. 1.1).

More posteriorly, these supraventricular sections transect the parietal lobe at the level of the inferior parietal lobule or superior parietal lobule, depending on the level of the section.

In the axial section, each cerebral hemisphere shows a curved lateral border and a flat medial border.

The central sulcus starts at the middle of the lateral border and dips into the hemisphere, taking a course medially and posteriorly and dividing the hemisphere into two almost equal halves.

In the higher supraventricular levels the central sulcus is also identified on the medial surface, and it is surrounded by the paracentral lobule. The latter is delimited posteriorly by the marginal branch of the callosomarginal sulcus and anteriorly by the paracentral sulcus. The lower supraventricular sections show the cingulate gyrus at the medial border, which is identified by the orientation of its cortex in an anteroposterior direction.

Posterior to the paracentral lobule (in the case of a higher section) or posterior to the cingulate gyrus (in the case of a lower section) there is the precuneus outlined posteriorly by the deep parietooccipital sulcus.

More posteriorly, the medial surface of the occipital lobe leads to the occipital pole. On the medial side of the hemisphere, the parietal lobe is well demarcated from the occipital lobe by an easily identified sulcus; on the lateral surface, no such anatomic demarcation lies between the two lobes.

High Ventricular Level (Fig. 1.4)

Sections in the high ventricular level transect the bodies of the lateral ventricles. An example is a section 4.7 cm above the external auditory meatus. On the lateral surface of the cerebral hemisphere from front to back (line 11 in fig. 1.1 a) the plane of the section transects the frontal gyri, the precentral and postcentral gyri, and the supramarginal and angular gyri of the inferior parietal lobule. On the medial surface from front to back, the plane of the section transects the superior frontal gyrus, cingulate gyrus, corpus callosum, isthmus of the cingulate gyrus, precuneus of the parietal