THE ROLE OF C.T. SCAN AND M.R.I IN THE DIAGNOSIS OF SUPRATENTORIAL GLIOMAS

ESSAY
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BY
TAREK IBRAHIM ABDEL-TAWAB
M.B.,B.CH.

SUPERVISORS

PROF. DR. YOUSSEF HAMED ZAKI
PROFESSOR OF RADIODIAGNOSIS
FACULTY OF MEDICINE
AIN SHAMS UNIVERSITY

BRIG. G. DR. SARWAT M. SELIM.
CONSULTANT RADIOLOGIST
MAADI ARMED FORCES HOSPITAL
MILITARY MEDICAL ACADEMY

DR. OMAR HUSSAIN
LECTURER OF RADIODIAGNOSIS
FACULTY OF MEDICINE
AIN SHAMS UNIVERSITY

FACULTY OF MEDICINE
AIN SHAMS UNIVERSITY

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INTRODUCTION AND AIM OF WORK

Introduction and Aim of Work

Gliomas are malignant tumors of the glial cells of the brain and account for 30-40% of all primary intracranial tumors.

The peak incidence of gliomas occurs near the beginning of the seventh decade of life.

The vast majority of adult gliomas are supratentorial, while 70-80% of these tumors in childhood are infratentorial [Russel et al., 1989].

The term glioma is used to designate a group of primary neoplasms of the central nervous system that are derived from the neuroglia, and identifies the astrocytomas, including glioblastoma multiforme, oligodendrogliomas and ependymomas.

Techniques available for studying the skull and brain include routine radiographs, complex motion tomography, radio nuclide studies, CT, CT combined with intrathecal air or intrathecal water-soluble contrast agents, MR, and angiography.

Skull radiographs play a limited role in current neuroradiologic practice. They are occasionally indicated in trauma, suspected foreign body, or when an overall view of a suspected bony lesion is warranted.

Complex motion tomography, previously used to examine the sella turcica, petrous region, middle and inner ear structures, and the skull base has been predominantly replaced by high resolution thin-section CT.

Standard radio nuclide imaging of the brain is of poor resolution compared to CT and MR [Roger et al., 1988].

With the advent and refinement of computed tomography and more recently, magnetic resonance imaging, intracranial neoplasm and their effects can be more readily recognized, So that appropriate therapy can be instituted without delay.

Computed tomography is usually the initial radiologic study in patients presenting with symptoms and signs suggestive of brain tumor [Mosskin et al., 1989].

MR is an extremely sensitive screening test for the presence of intracranial tumor [Lee BCP et al., 1985].

The ability of MR to image in three planes frequently provides more optimal anatomic definition and may help in determining if a lesion is intra- or extra-axial in location [Roger et al., 1988].

The aim of this work is to evaluate early detection of supratentorial gliomas, its localization, and its extent by CT scan, and MRI.

ANATOMY

Anatomy:-

The dura mater of the brain consists of a dense, strong, fibrous membrane. In many places it lies in contact with the "endosteal layer" which is the ordinary periosteum. In other places the fibrous layer of the dura mater is separated from the "endosteal layer" by venous sinuses and the meningeal arteries and, by the passage of the nerves.

The fibrous layer is raised into two folds. This folds project into the cranial cavity; one such fold roofs in the posterior cranial fossa, forming the tentorium cereblli.

Another fold forms the falx cerebri, lying in the midline between the two cerebral hemispheres. This two folds are connected to each other posteriorly.

The function of these flanges, or septa, is to minimize rotary displacement of the brain.

The tentorium cerebelli is a flange of the fibrous layer which projects from the margins of the transverse sinuses and the margins of the superior petrosal sinuses.

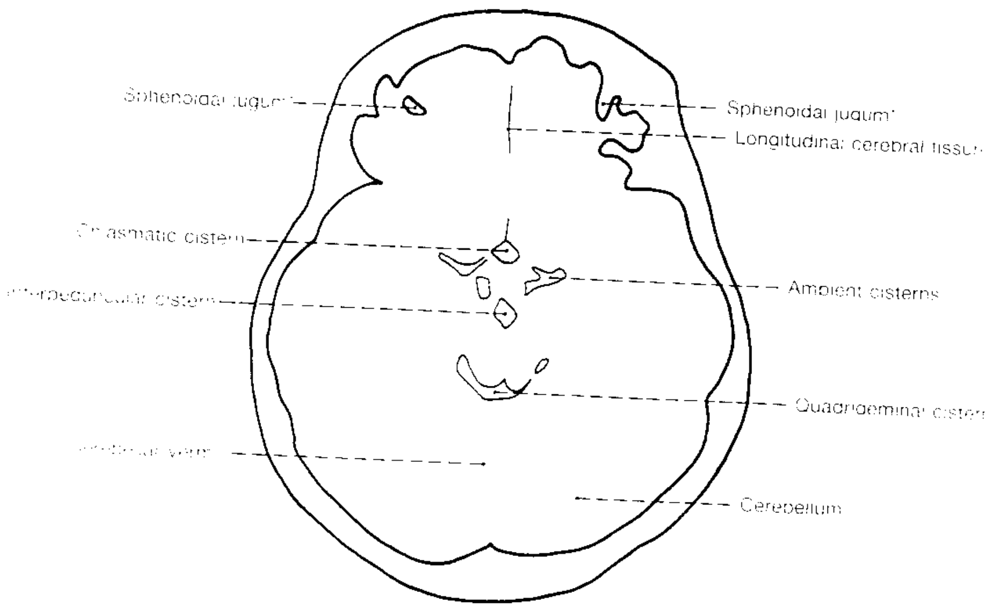
It is attached, from the apex of one petrous bone to the other, along the upper borders of the petrous temporal bones and horizontally along the inner surface of each side of the skull to the internal occipital protuberence.

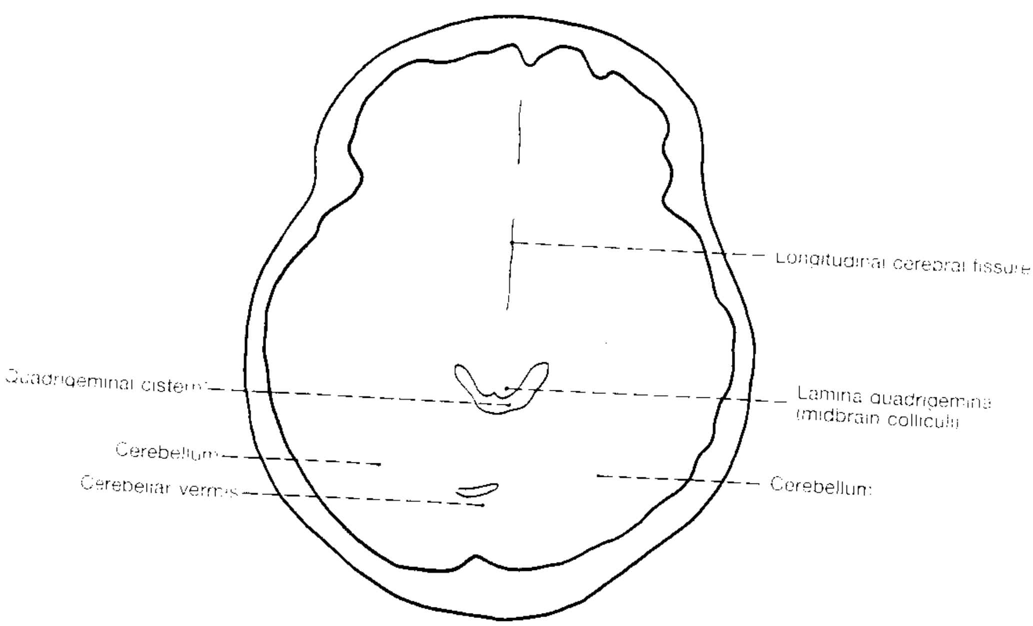
Its upper and lower layers are separated at their bony attachments by the superior petrosal and transverse sinuses, but elsewhere are intimately fused with each other.

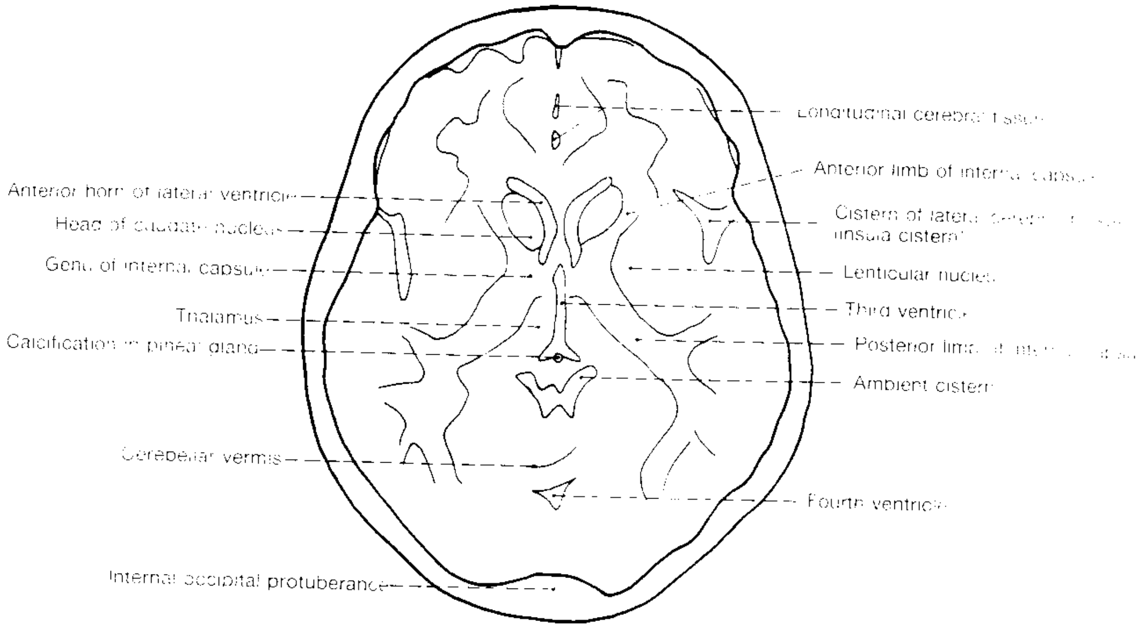
The free margin is U- shaped and lies at a higher level than the bony attachment of the tentorium.

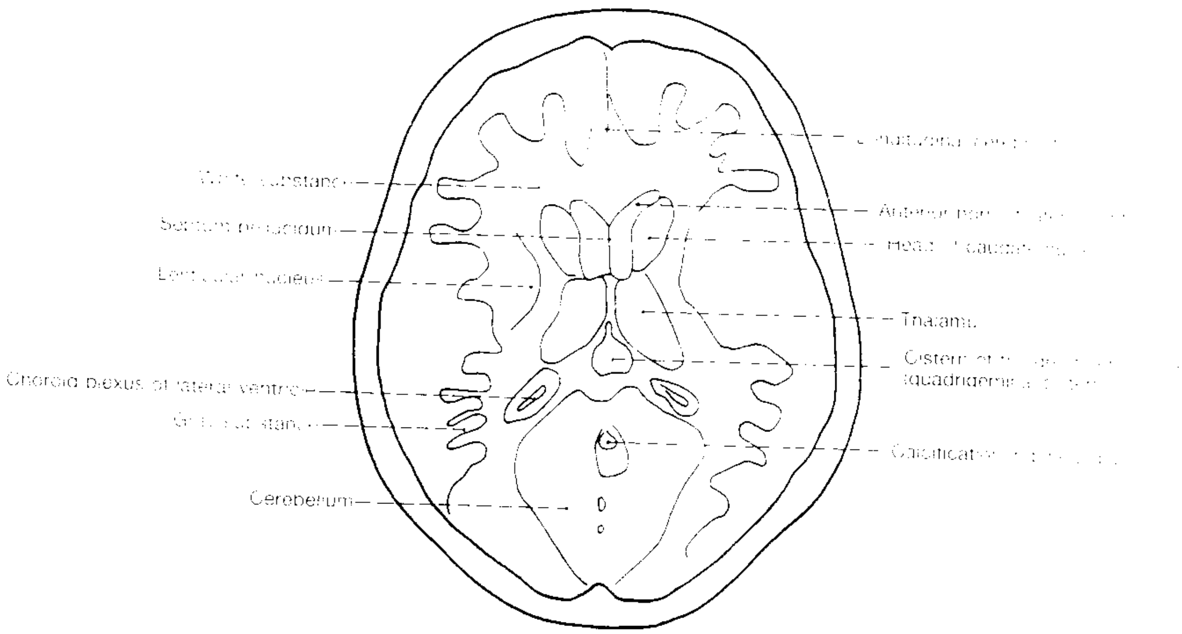
The membrane slopes concavely upwards as it converges from the attached to the free margin, in conformity with the shape of the upper surface of the cerebellum and the under surface of the posterior part of the cerebral hemisphere.

The free concave margin is traceable forwards to the anterior clinoid processes. Over the superior petrosal sinus it overlies the attached margin, and from this point forwards to the anterior clinoid processes it lies as ridge of dura mater on the roof of the cavernous sinus. To the medial side of the ridge is a concave triangular fossa which is pierced by the third and fourth nerves [Last, 1988].


Sphenoidal jugum
Sphenoidal jugum
Longitudinal cerebral fissure
Ambient cisterns
Quadrigeminal cistern
Cerebellum


Longitudinal cerebral fissure
Quadrigeminal cistern
Lamina quadrigemina (midbrain colliculi)
Cerebellum
Cerebellar vermis
Cerebellum


Anterior horn of lateral ventricle
Head of caudate nucleus
Genu of internal capsule
Thalamus
Calcification in pineal gland
Cerebellar vermis
Internal occipital protuberance
Anterior limb of internal capsule
Cistern of lateral
(insula cistern)
Lenticular nucleus
Third ventricle
Posterior limb
Ambient cistern
Fourth ventricle


Septum pellucidum
Choroid plexus of lateral ventricle
Cerebellum
Thalamus
Cistern of
(quadrigeminal

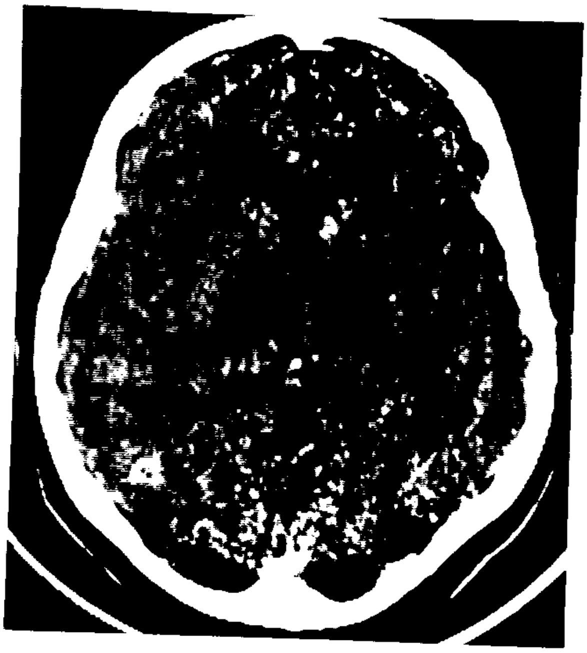


Figure 1