COMPARATIVE STUDY BETWEEN THE MANAGEMENT OF TRAUMATIC AND SPONTANEOUS INTRACEREBRAL HAEMATOMAS

Thesis

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By

Hussein AbdelRahman Fathalla
(M.B.; B.Ch.)
Senior Registrar of Neurosurgery
Faculty of Medicine, Cairo University

Supervised by

Prof. Dr. Mostafa Lotfi Abou El Nasr
Head and Professor of General Surgery Department
Faculty of Medicine, Cairo University

Prof. Dr. Khaled Makin
Professor of General Surgery
Faculty of Medicine, Cairo University

Prof. Dr. Alaa Abdel Fattah
Assistant Professor of Neurosurgery
Faculty of Medicine, Cairo University

Faculty of Medicine
Cairo University
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بسم الله الرحمن الرحيم

”قالوا سبحانك لا علم لنا إلا ما علمتنا إنك أنت العليم الحكيم“

صدق الله العظيم
البقرة ٣٢

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TO
MY FAMILY
AND
MY FIANCÉE

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ABBREVIATIONS

ACA	Anterior cerebral artery
ACHa	Anterior choroidal artery
AVM	Arterio-venous malformation
BBB	Blood brain barrier
BP	Blood pressure
C4	4th segment of internal carotid artery
CAA	Cerebral amyloid angiopathy
CBF	Cerebral blood flow
CN	Cranial nerve
CPP	Cerebral perfusion pressure
CSF	Cerebrospinal fluid
CT	Cat Scan
DIC	Dissiminated intravascular coagulopathy
DM	Diabetes milletus
FBS	Fasting blood sugar
GCS	Glasgow coma score
GOS	Glasgow outcome score
HB	Hemoglobin
HTN	Hypertension
ICH	Intracerebral Hemorrhage
ICP	Intracranial Pressure
ICU	Intensive care unit
INR	International Normalized ratio
IV	Intravenous
M1	1st segment of middle cerebral artery
M2	2nd segment of middle cerebral artery
MABP	Mean arterial blood pressure
MCA	Middle cerebral artery
MRI	Magnetic resonance imaging
OP	Operation
PaCO2	Carbon dioxide pressure
PLT	Platelets
RR	Respiratory rate
SAH	Subarachnoid hemorrhage
SBP	Systolic Blood pressure
SICH	Spontaneous Intracerebral hematoma
SPECT	Spectroscopy
TICH	Traumatic Intracerebral hematoma
Tpa	Tissue plasminogen activator
US	Ultrasound
YRS	Years

ABSTRACT

Traumatic and spontaneous intracerebral hematomas are very common disorders in clinical practice. Although both are described as intracerebral hematomas and sometimes may even appear radiologically the same, they behave differently in almost every other aspect. The aim of this study is to review the literature and recent publications regarding both conditions and to compare between them regarding their clinical presentation, management and prognosis. This may help us gain further insight into their management, and thus improve the care given to our patients.

This study was done prospectively on 14 patients admitted to Kasr el Aini Neuro-emergency center, all with intracerebral hematomas. Patients were selected so as to be equally divided into Spontaneous and Traumatic intracerebral hematomas. All data regarding these patients were reviewed, including age, sex, medical history, clinical presentation, radiological findings and prognosis. The management protocols were also maintained for each group.

After comparing the results, it was found that the median age of patients with TICH was lower than the median age of patients with SICH, Younger age and higher GCS score at presentation were strongly related to a favorable outcome for both types of hemorrhage and Irrespective of intervention, much better outcomes were achieved by patients with TICH compared with those with SICH.

This concludes that both TICH and SICH have different features and that TICH have a much better prognosis than SICH. Aggressive management and surgical intervention is therefore more justified for TICH than for SICH.

Keywords:

Neurosurgery – Spontaneous intracerebral hematoma – Traumatic intracerebral hematoma – Comparison – Medical management – Surgical management - Outcome

INTRODUCTION AND AIM OF THE WORK

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Traumatic intracerebral haematomas occurs in up to 15% of patients following head injury[15] and Spontaneous intracerebral haematoma accounts for up to 30% of all strokes.[2] These two disorders are therefore very common and are considered to be the third leading cause of death with only 38% of affected individuals surviving more than 1 year.[5]

Gross examination of the morbid anatomy yields similar findings for the two conditions, but they may differ in pathogenesis, management and prognosis.[18] Spontaneous ICH (Intracerebral hematoma) and TICH (Traumatic intracerbral hematoma) have therefore been discussed in the literature as separate clinical entities.

The objective of this study is to discuss both conditions and compare between them regarding their presentation, management protocols and prognosis

REVIEW OF LITERATURE

ANATOMY

Gross Anatomy of the Brain[18,51]

Cerebrum: (Figs. 1 and 4)

The cerebrum is composed of 2 cerebral hemispheres, each has five lobes: frontal, parietal, occipital, temporal, and insular. In a lateral view of the brain, the central sulcus runs obliquely downward and forward from approximately the midpoint of the dorsal margin of the cerebral hemisphere, ending just before it reaches the lateral sulcus. It separates the frontal lobe from the parietal lobe .The lateral sulcus runs horizontally on the lateral surface separating the frontal and parietal lobes from the temporal lobe. There is no prominent sulcus delineating the parietal and temporal lobes from the occipital lobe, so an imaginary line is drawn from the preoccipital notch, an indentation on the inferior margin of the hemisphere, to the point where the parietooccipital sulcus crosses the dorsal midline.

Cerebellum: (Figs. 2 and 4)

There are 2 cerebellar hemisphere and each has three lobes: anterior lobe, posterior lobe, and flocculonodular lobe. Each of the lobes has a midline portion in the vermis and a lateral portion,which is the hemisphere. The primary fissure separates the anterior and posterior lobes. The prenodular fissure (posterolateral fissure in hemisphere) separates the posterior lobe from the flocculonodular lobe. The cerebellar vermis has 10 sublobules

Diencephalon (Thalamus, Pineal Gland): (Fig. 3 and4)

The ventral aspect of the diencephalon contains the optic nerves (CN II) (cranial nerve II), optic chiasm, and optic tracts, as well as tuber cinereum (elevation on the ventral aspect of the hypothalamus) and mammillary bodies.

Mesencephalon: (The Midbrain) (Fig. 4)

The ventral aspect of the midbrain contains the cerebral peduncles and the depression between them, the interpeduncular fossa, from which the oculomotor nerves (CN III) emerge. The trochlear nerves (CN IV), which exit from the dorsal aspect of the midbrain, course ventrally around the cerebral peduncles to join the oculomotor nerves en route to the orbit where they supply extraocular muscles.

Pons and medulla: (Fig. 4)

The ventral aspect of the pons contains the basilar pons and the large bundles that connect it to the cerebrellum, the middle cerebellar peduncles. The large trigeminal nerves (CN-V) come off the lateral part of the basilar pons. The pontomedullary junction is a line that delineates the basilar pons from the medulla. The abducens nerves (CN VI) exit the pontomedullary junction in line with the preolivary sulcus. More laterally the facial (CN VII) and vestibulocochlear (CN VIII) cranial nerves emerge from the cerebellopontine angle next to the flocculus of the cerebellum. On the ventral aspect of the medulla the medullary pyramids (containing the pyramidal tracts) run vertically on either side of the ventral median fissure, which is interrupted by the crossing of the tracts in the pyramidal decussation. The pyramids are separated from the olives by the preolivary sulcus

from which the roots of the hypoglossal nerves (CN XII) emerge. The glossopharyngeal (CN IX) and vagus (CN X) nerves exit from the postolivary sulcus

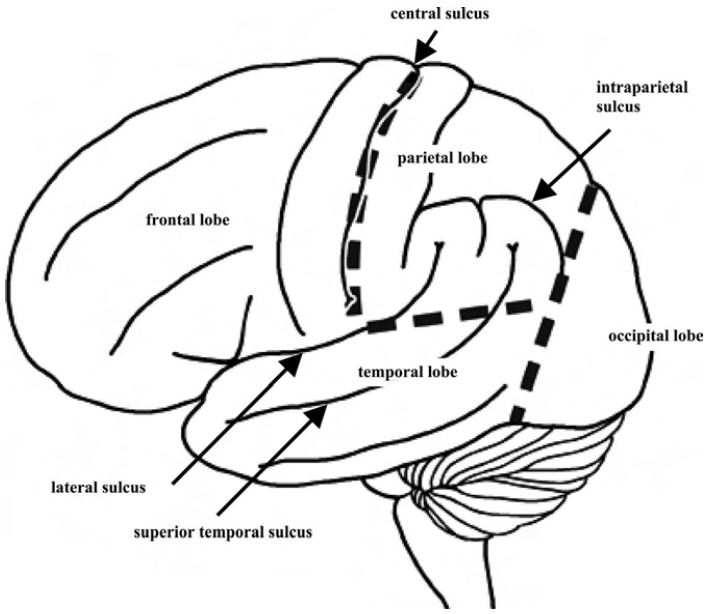

Fig (1): Lateral surface of the brain[51]

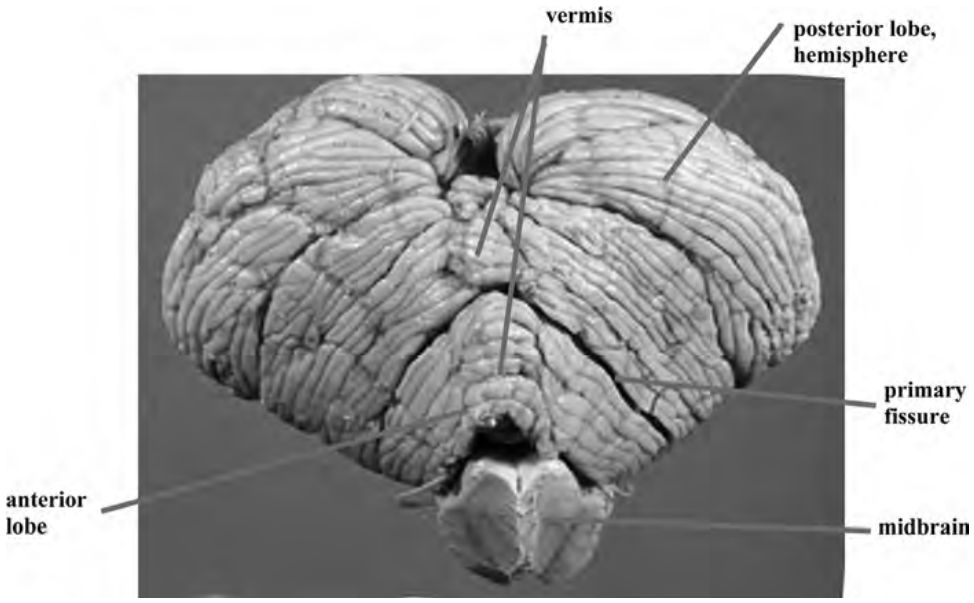

Fig. (2): The cerbellum[51]