:TORS INFLUENCING LONG TERM RESULTS OF INTRACRANIAL GLIOMA SURGERY IN EGYPT

Thesis

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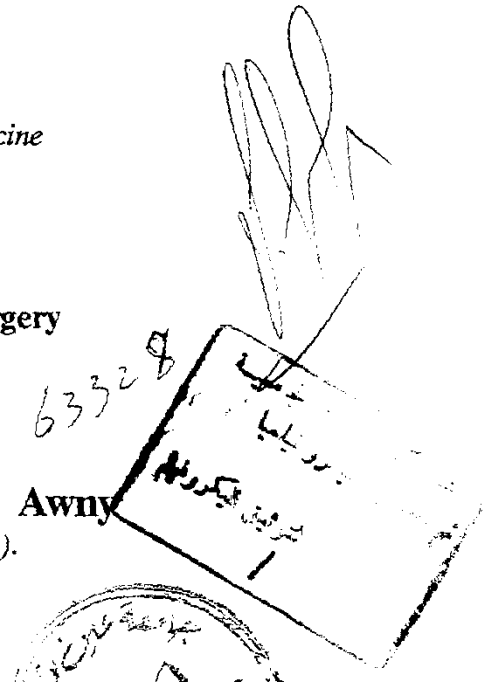

By

Husam Mohamed Mahmoud Awny
M.B.B.Ch., M.S. (General Surgery).

Supervisors

Prof. Dr. Ahmed Samir El-Molla
Professor of Neurosurgery
Ain Shams University

Prof. Dr. Sharif Ezzat Abd El-Aziz
Professor and head of Neurosurgery Department
Al-Azhar University

Prof. Dr. Abd El-Hamid Ahmed Wafik
Professor of Pathology,
Al-Azhar University

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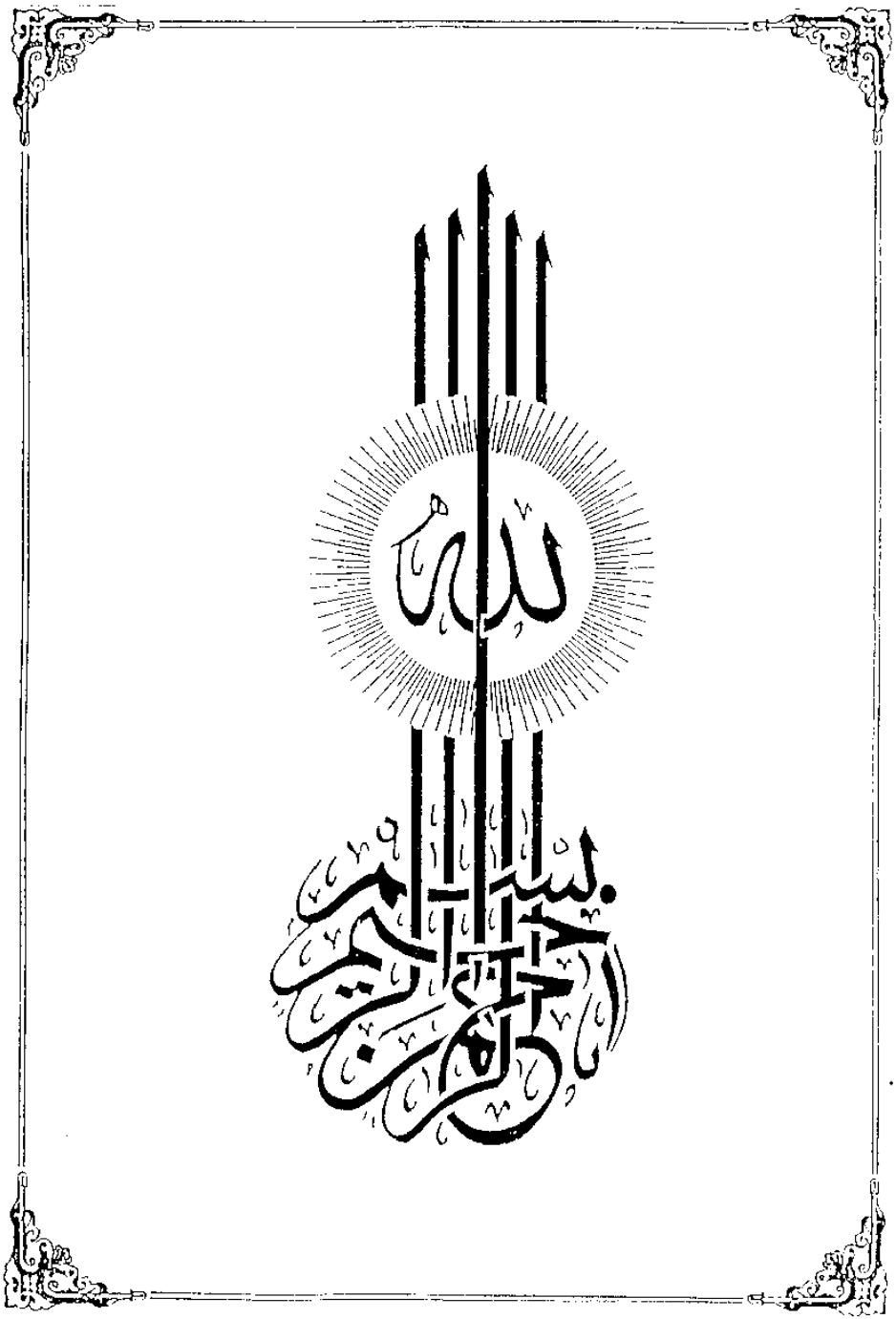

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Introduction

INTRODUCTION

The study of tumors of the nervous system has been a subspecialty fertile in technical developments that have advanced the field of neurosurgery as a whole.

Paradoxically, neuro-oncology has achieved relatively limited success in improving the prognosis for most patients with neuroepithelial tumors as most of them are incompletely resectable, and recurrent tumor growth has proved to be particularly refractory to the efforts of neurosurgeons, radiotherapists and medical oncologists. Many types of neuroepithelial tumors thus have a grim prognosis and are responsible for a yearly death rate equal to their annual incidence, **(Gudmundsson, 1970)**.

Gliomas account for about fifty to sixty per cent of primary intracranial tumors in adults,**(Walker et al., 1985)**.

They are derived from elements of the brain parenchyma of neuroectodermal origin which comprise the neuroglia, the neurones, the ependyma and its specialised epithelial layer of the choroid plexus. Together with the previous category, some less common neuroectodermal tumors are included under the general term of glioma for their common usage, historical development and biochemical similarities,**(Northfield, 1973)**.

In the period of Bressler (1839), gliomas were known as "Medullary sarcoma" or "Fungus medullare".

The great pathologist "Virchow" (1863), recognised the supportive elements of the nervous system, labelled them neuroglia, and initiated the cytological approach to classification. He created the term "Glioma" and classified these tumors for the first time by the type of cell **(Butler et al, 1982)**.

Golgi (1884), described astrocytomas as the principal form of glioma and noted that they consisted of "Fibre-forming spider cells".**(Finkemeyer et al., 1975)**.

The next variety to be identified was ependymoma by Storch in 1899. Tooth (1912), was the first to emphasize the correlation of morphological structure and clinical course.

He discussed benign and malignant gliomas, and the presence of histologically different areas in the same glioma. **(Russell and Rubinstein, 1977)**.

It is now more than a hundred year since Bennett and Godles performed the first successful removal of a glioma from the brain in 1884. Despite the passage of time and the advance of different surgical techniques, either surgery alone or combined with radiotherapy, chemotherapy or immunotherapy it did not bring a satisfactory median survival period to patients harbouring a malignant glioma **(Butler et al, 1982)**.

Review of Literatures

Classification

CLASSIFICATION

The classification of gliomas have provoked considerable controversy. This is because of the complexity of these tumors, which is attributable to the considerable number of cell types involvd in neoplasia and also to the variations found within the major classes of glioma and often in different parts in one individual tumor. No one classification has yet satisfied all requirements or received general acceptance.

Most modern classifications are based upon that of Bailey and Cushing (1926). They studied the embryogenesis of the various cellular components of the central nervous system, they then attempted to classify the tumors in terms of the different morphological stages through which these cells pass in ontogenesis. They enumerated twenty cell types arising from the medullary plate from which fourteen tumors derived. (Fig. 1)

Bailey and Cushing found that tumors with less differentiated cells grow more rapidly than tumors composed of more differentiated cells. The groups of tumors were arranged in series according to the average survival period, longevity was significantly related to greater degree to the differentiation of the anaplastic cells. So, they created a classification of clinical value by correlating the types of tumor with survival times.

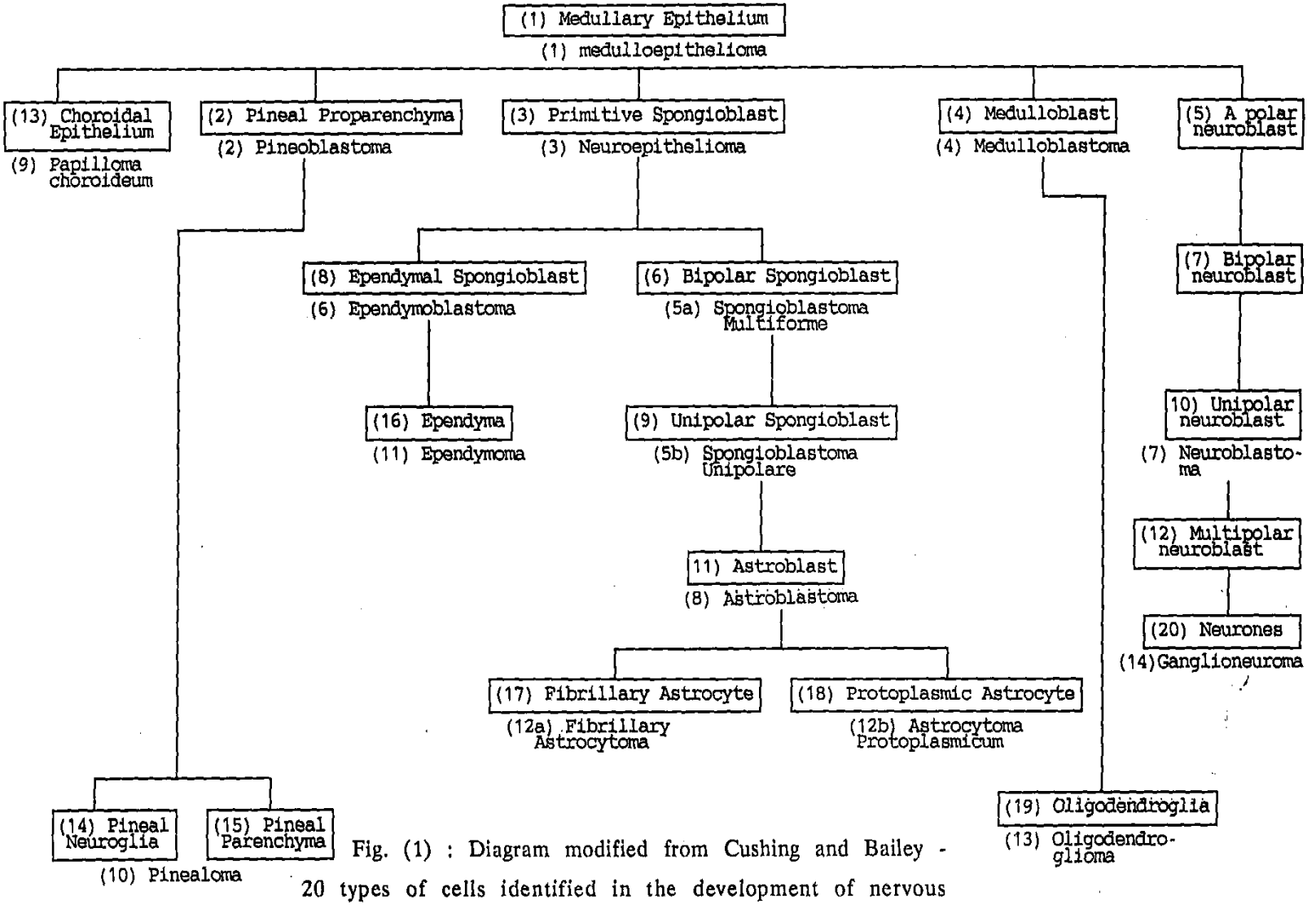

Fig. (1) : Diagram modified from Cushing and Bailey - 20 types of cells identified in the development of nervous system and 14 types of glial tumors presumably derived from these cells **(Butler et al., 1982).**

With increased use, Bailey in 1927 decided to change the term "Spongioblastoma Multiforme" to "Glioblastoma Multiforme", reserving the term spongioblastoma for tumors related to the primitive spongioblast. The term glioblastoma was used for tumors of unipolar and bipolar spongioblast cells.

Among the trials for modification and simplification, Kernohan and associates (1949), proposed a scheme with four grades of malignancy and applied these grades to astrocytomas, oligodendrogliomas, ependymomas and neuroastrocytomas. They considered "glioblastoma multiforme", "astroblastoma" and "polar spongioblastoma" a variants of astrocytoma. Also, medulloblastoma was considered a type in itself and not graded. They found a direct relation between the degree of anaplasia and postoperative survival period. Tumors that were histologically more anaplastic were found to correspond to shorter survival period.**(Butler et al., 1982)**.

Russell and Rubinstein (1963), included the tumors of the neurone series in their classification of gliomas as the glial elements not only enter the composition of the central ganglioneuromas but may proliferate sufficiently to warrant the name "ganglioglioma". Further support for their inclusion is provided by the medulloblastomas: a group in which neuroblastic differentiation is well recognised though inconstant. They reserved the term "neuroepithelioma" for certain retinal tumors and included the others in the group "retinoblastoma". Their classification also included tumors of pineal body that are

derived from the parenchyma cells which are of neuroepithelial origin.

A. Tumors of glial series:

I- Astrocytic group:

1. Astrocytoma.
2. Astroblastoma.
3. Polar spongioblastoma

II- Oligodendroglia:

Oligodendroglioma.

III- Ependyma:

1. Ependymoma
2. Choroid plexus papilloma.
3. Colloid cyst.

IV. Glioblastoma multiforme.

B. Pineal Parenchyma

I. Pineoblastoma.

II. Pineocytoma.

C. Retina (Primitive Epithelium)

I. Retinoblastoma.

D. Tumors of neurone series.

I. Medulloblastoma.

II. Medulloepithelioma.

III. Neuroepithelioma.

IV. Ganglioneuroma and ganglioglioma.

(Russel and Rubinstein, 1977).

World Health Organization (WHO) classification :

A. Astrocytic tumors:

I- Astrocytoma

1. Fibrillary.
2. Protoplasmic.
3. Gemistocytic
4. Pilocytic astrocytoma.

II- Subependymal Giant Cell Astrocytoma.

(Ventricular tumor with tuberous sclerosis)

III- Astroblastoma.

IV- Anaplastic astrocytoma.

B. Oligodendroglial tumors:

I- Oligodendroglioma.

II- Mixed oligoastrocytoma.

III- Anaplastic oligodendroglioma.

C. Ependymal and choroid plexus tumors:

I- Ependymoma

1. Myxopapillary ependymoma.
2. Papillary ependymoma.
3. Subependymal.

II- Anaplastic ependymoma.

III- Anaplastic choroid plexus papilloma.

D. Pineal cell tumors:

I- Pineocytoma.

II- Pineoblastoma.

E. Neuronal tumors:

I. Gangliocytoma.

II. Ganglioglioma.

III. Ganglioneuroblastoma.

IV. Anaplastic gangliocytoma and ganglioglioma.

F. Poorly differentiated and Embryonal tumors:

I. Glioblastoma.

1- Glioblastoma with sarcomatous component.

2- Giant cell glioblastoma.

II. Medulloblastoma

1. Desmoblastic medulloblastoma.

2. Medullomyoblastoma

III- Medulloepithelioma

1- Primitive polar spongioblastoma.

2- Gliomatosis cerebri.

(Cobb and Yomans, 1982).

Finally, the problem of classification should be approached clinically as well as by histological means. Pathologists classify