METASTATIC BRAIN LESIONS

THESIS

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(General Surgery)

by

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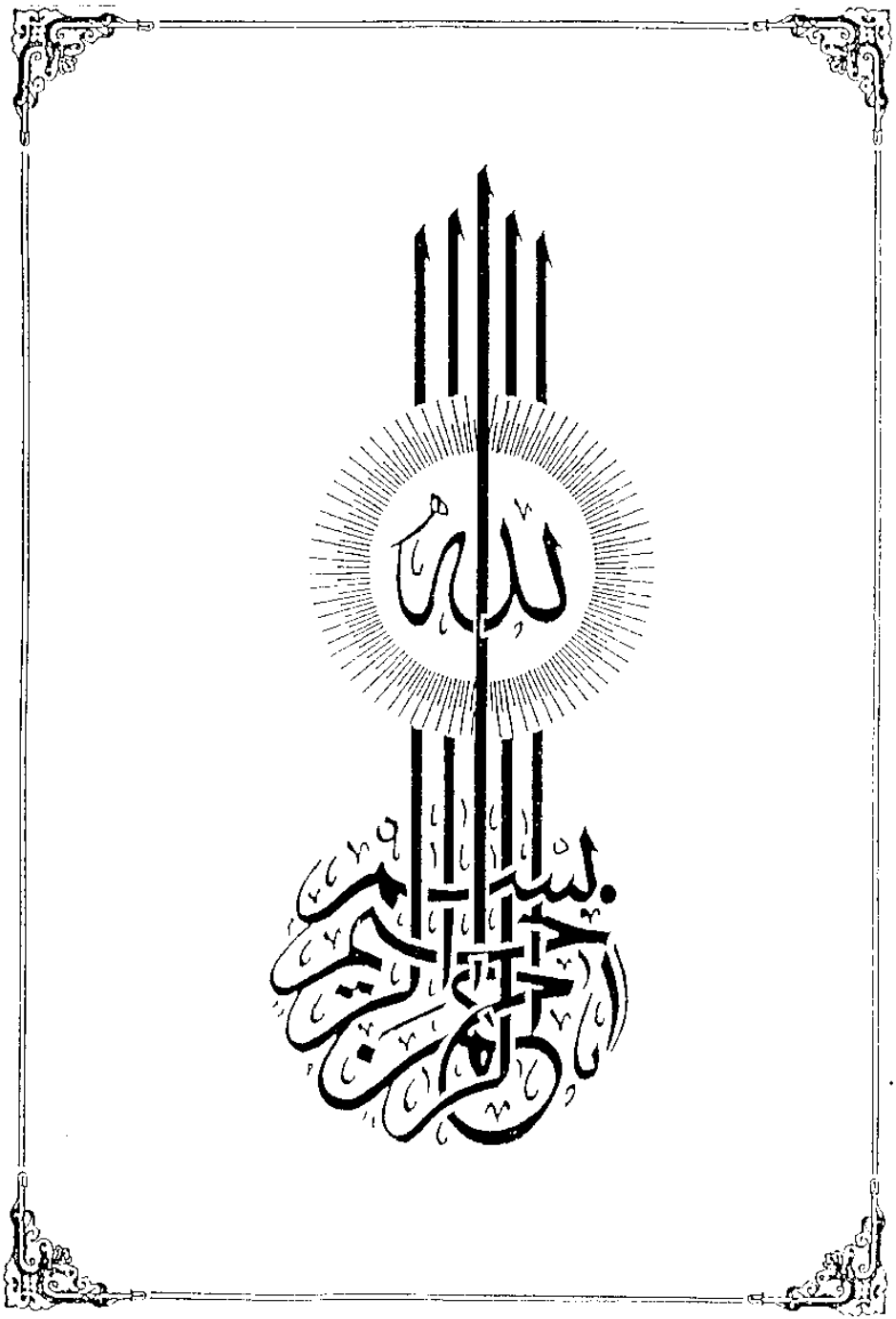
To my wife and my son
who shared with me every
step of this work.



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CONTENTS

*** INTRODUCTION ***

Numerous carcinomas and sarcomas show a tendency to metastasis in the central nervous system .

In patients with known extraneural primary tumours, the direct diagnosis of cerebral metastasis is frequent and poses no special problems. However, even in such cases the differential diagnosis should also include the possibility of a primary tumour of the central nervous system. If several foci are present, the diagnosis (metastasis) will be the most probable.

In case of a solitary focus, even the most advanced neuro-radiological diagnostic procedures do not always allow a conclusive discrimination between a-single metastasis and a primary tumour of the central nervous system.

(Ebhardt, et al . 1984)

According to many data in the literature, about 10 % of intracranial tumour subjected to operation are metastases. The actual incidence of intracranial

metastases may well be significantly higher, since where there are no symptoms or where multiple metastases are present no diagnosis is made or no operation is carried out. While it was previously the case that neuro-radiological detection of small intracranial tumours in particular was frequently difficult, even when they were associated with relevant symptoms, tumours of this type are nowadays easily diagnosed by the early use of computed tomography.

(Schirmer, et al. 1984)

The treatment of metastatic disease to the central nervous system remains a difficult problem for all physicians . Despite the introduction of computerized axial tomographic scanning, a diagnostic tool which has revolutionized the recognition of intracranial mass lesions, the treatment of metastatic disease to the C N S remains primarily palliative.

(Marshall 1984)

*** INCIDENCE ***

Carcinoma of the lung is the most frequent primary tumour producing cerebral metastases, although the percentage of cerebral metastases is higher in a less common tumour, malignant melanoma.

(Arseni, et al . 1975)

The majority of patients with carcinoma of lung , melanoma and cancer of the colon had multiple cerebral metastases , whereas single metastases were more common in breast cancer, renal carcinoma, ovarian carcinoma and osteogenic sarcoma.

(Kagan , et al . 1976)

Metastatic disease of the brain in children differs in several respect from that in adult. In first place, the incidence is lower, only 6 % according Vannucci and Baten (1974) in a study of 216 children dying of cancer. The brain was involved with metastatic disease in 13 of those cases. Pulmonary involvenent

preceded central nervous system involvement in all cases. Neuroblastoma, rhabdomyosarcoma, and Wilms tumours were the most common primary tumours.

Interestingly, while wilns tumour was the third most commonly diagnosed pediatric neoplasm, it metastasized to the brain two to five times as frequently as the more common neuroblastoma or rhabdomyosarcoma.

(Gamache, et al . 1980)

The incidence of metastatic carcinoma to the central nervous system appear to be increasing in proportion to the increased diagnosis of cancer in the population as a whole. Autopsy data according to Marshall (1984) has shown that in patients dying of cancer, the incidence of cerebral metastasis has varied from 12 percent to 37 percent. In the experience of most major centers, approximately 60 percent of patients undergoing scanning are found to have multiple lesions and 40 percent have a single metastasis . (Marshall. 1984)

While intraparenchymal metastases represent the most common type of intracranial secondary deposits, meningeal carcinomatosis appears to be occuring with increasing frequency. This appears to be particularly true in the case of carcinoma of the breast.

(Bramlet, et al . 1976)

Taking the incidence of cerebral metastases from a different angle, Willis (1952) estimates that they occur in about 5 percent of all fatal cases of malignant disease.

(Russell, et al . 1963)

*** PATHOLOGY ***

1) Methodes of dissemination.

a - Haematogenous.

by blood stream.

spread of bone metastases.

b - Direct extension of local tumour

chordoma.

bone sarcoma.

rhabdomyosarcoma.

carcinoma.

orbital tumour.

2) Macroscopic pictur.

3) Microscopic pictur.

4) Usual sites and its incidence.

5) Unusual sites of metastases.

Involvement of central nervous system and its meninges by neoplasm arising in other tissues may result either from direct local extension of primary growth, or from blood - borne metastases.

A) Haematogenous metastasis.

This more important group has been reviewed in many publication. The intracranial contents may be directly involved through the carriage of neoplastic cells by the blood - stream, with the development of a metastasis in situ. But the central nervous system is often involved through metastasis to the adjacent bone, when the proliferating cells extend in continuity to the meninges .

This former alternative will be dealt with first:

- Direct metastasis by blood - stream.

The topography of second growths point to the carriage of tumour cells to the cenrtal nervous system by the arteries of supply. It has , however , been argued