FOCAL INFECTIONS OF THE C.N.S

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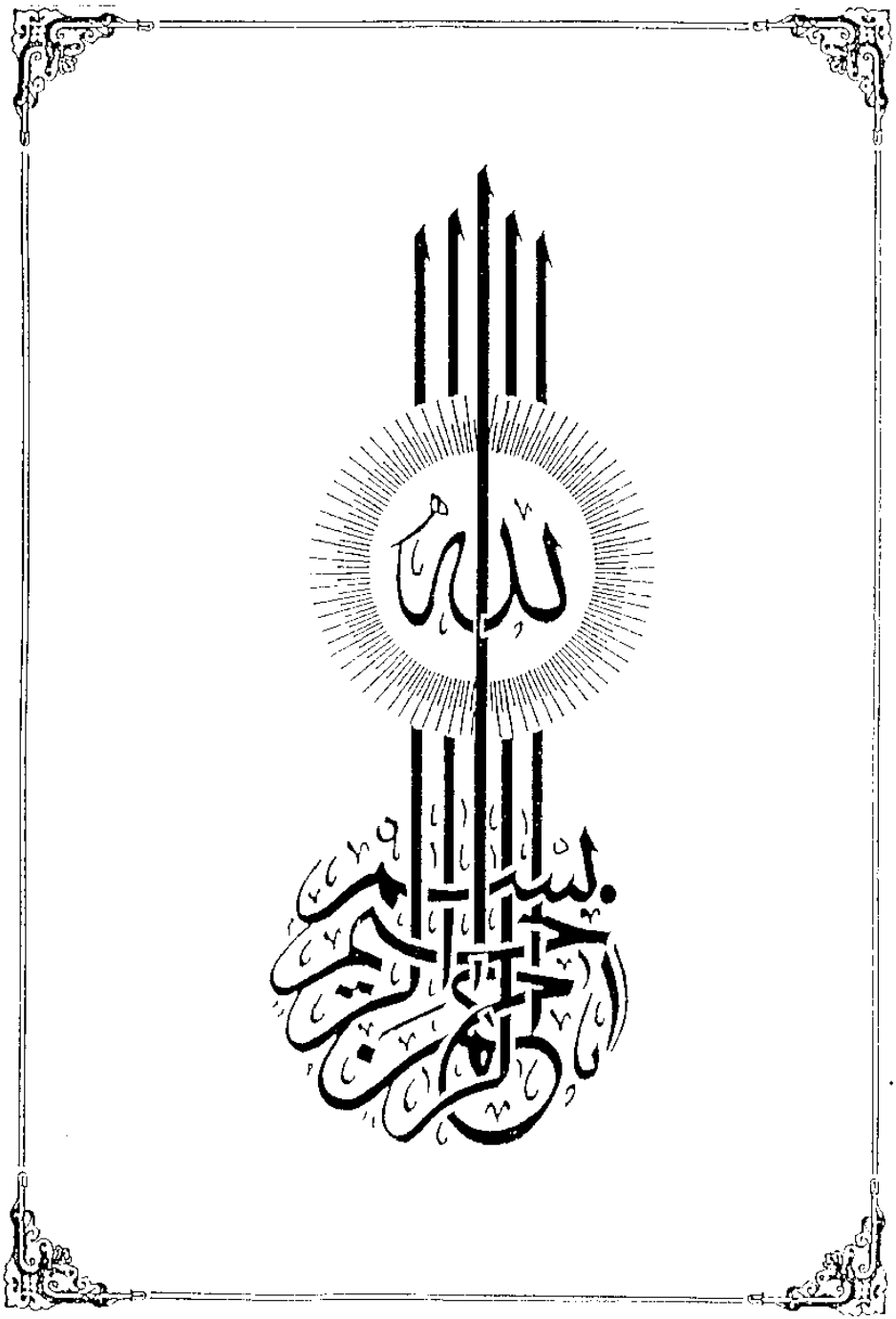

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INTRODUCTION

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Infections of the CNS represent a group of life threatening diseases which present a formidable challegne to the physician. Prior to the introduction of the modern therapeutics precise differential diagnosis of the CNS diseases was largely academic. The developement of the effective antimicrobial agents and modern surgical techniques appeared to provide the panaceas for the clinician previously faced with hopeless disease. However despite these advances in therapeutics, there remains a very significant mortality and morbidity with CNS infections. It appears that further prevention of death and lessening of sequelae cann't be left to the microbiolagists or to new antibiotics but must be the task of the physician who canaccomplish earlier and more accurate diagnosis, initiate appropriate therapy and provide attention to the details of the supportive care. We will not only emphasize specific therapy which have received excellent coverage in recent reviews. But also we have chosen to stress principles and clinical anatomical correlations which may aid the physician in the earlier suspicion of central nervous system infection and its differential diagnosis, in hopes of quickening the pace of therapeutic intervention (Butler, 1973).

AIM OF ESSAY

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Focal infections of the C.N.S. are potenially life threatening and are capable of producing severe neuorologic deficits.

Modern antibiotic therapy has somewhat reduced the perils from these infections but still there is a very significant mortality and morbidity which can be greatly avoided by rapid and accurate diagnosis and rapid institution of therapy and that is the real aim of this subject.

C L I N I C O - A N A T O M I C A L

C O R R E L A T I O N

CLINICO-ANATOMICAL CORRELATIONS

In evaluating a child with suspected infection of the CNS it is helpful to keep in mind the relationship of the brain and the spinal cord with their surrounding protective layers (Fig I). The brain and the spinal cord are present in bony envelope formed by the cranium and the vertebral canal. The dura forms the internal periosteum of the cranial bones with very firm attachement, but in the spinal cord there is true.epidural space and is most prominent posteriorly in the thoracic and lower lumar regions. That is why epidural abscess, if occurs in the skull it tends to be very localized but it is not the same for the vertebral canal.

The outer arachnoid lie in direct contact with the dura but they are not attached to each other. So the infection at this potential space tends to spread forming empyema (subdural) rather than to form abscess but it tends not to cross to the opposite side due to reflection of the meningies under the flax cerebri, flax cerbelli, the tentorium and the base of the skull. Next to the dura there is the subarachnoid space. This is the only open space with communications

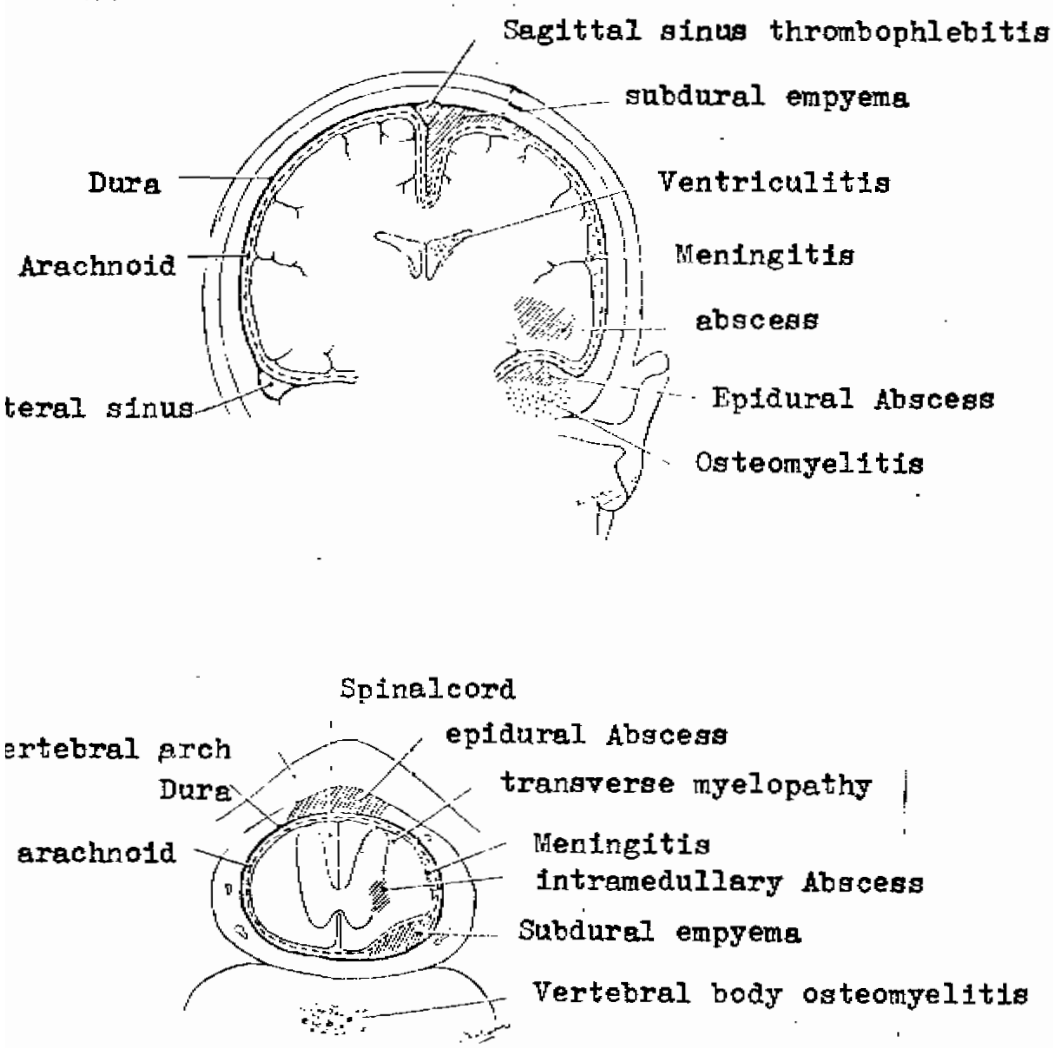

Fig 1. Relationships of the brain and spinal cord with their surrounding protective layers. (C ted from Butler 1973).

to the cavities of the neuraxis through two foramena, which are called the foramena of Lushka and Majendi. This space is filled by the CSF. The CSF is formed by choroid plexuses inside the ventricles mainly the lateral ones and passes through these foramena to the subarachnoid space to pass over the lateral surfaces of the two hemispheres and around the spinal cord where it is drained. So the CSF will show the evidence of inflammation in case of meningitis but only reflects a reactive inflammatory response if deeper structures are affected and even may be sterile. (Butler 1973).

E P I D E M I O L O G Y

EPIDEMIOLOGY

Focal Infections of the CNS includes :

1) Brain abscess and intramedullary abscess of the spinal cord.
2) Subdural empyema .
3) Epidural empyema.
4) Septic intracranial venous sinus thrombosis .

"See figure I" P.4

I. Causative Agents :

The most common organisms isolated from brain abscess are streptococci, staphylococci and pneumococci (Wright and Ballantine, 1967).

But gram negative bacilli should be considered as one of these common causes (Hoffman, et al, 1970).

In the series of 64 children having brain abscess at "The Hospital for Sick Children" the most common organisms revealed were as shown in table I.

Bacteria isolated from 64 children with brain abscess.

Organism	No
Microaerophilic streptococci	20
S. pneumoniae	8
Staph. epidermidis	7
Staph. aureus	6
E. coli	5
Proteus	5
Bacteroides	5
Klebsiella	3

Table I (Edward Brett, 1983).

Other organisms which can cause brain abscess are Listeria monocytogenes (Crocker and Leicester , 1976) and Mycobacterium TB (Whitener, 1978).

Fungal infections can cause brain abscess especially multiple abscesses. The most common types are candida