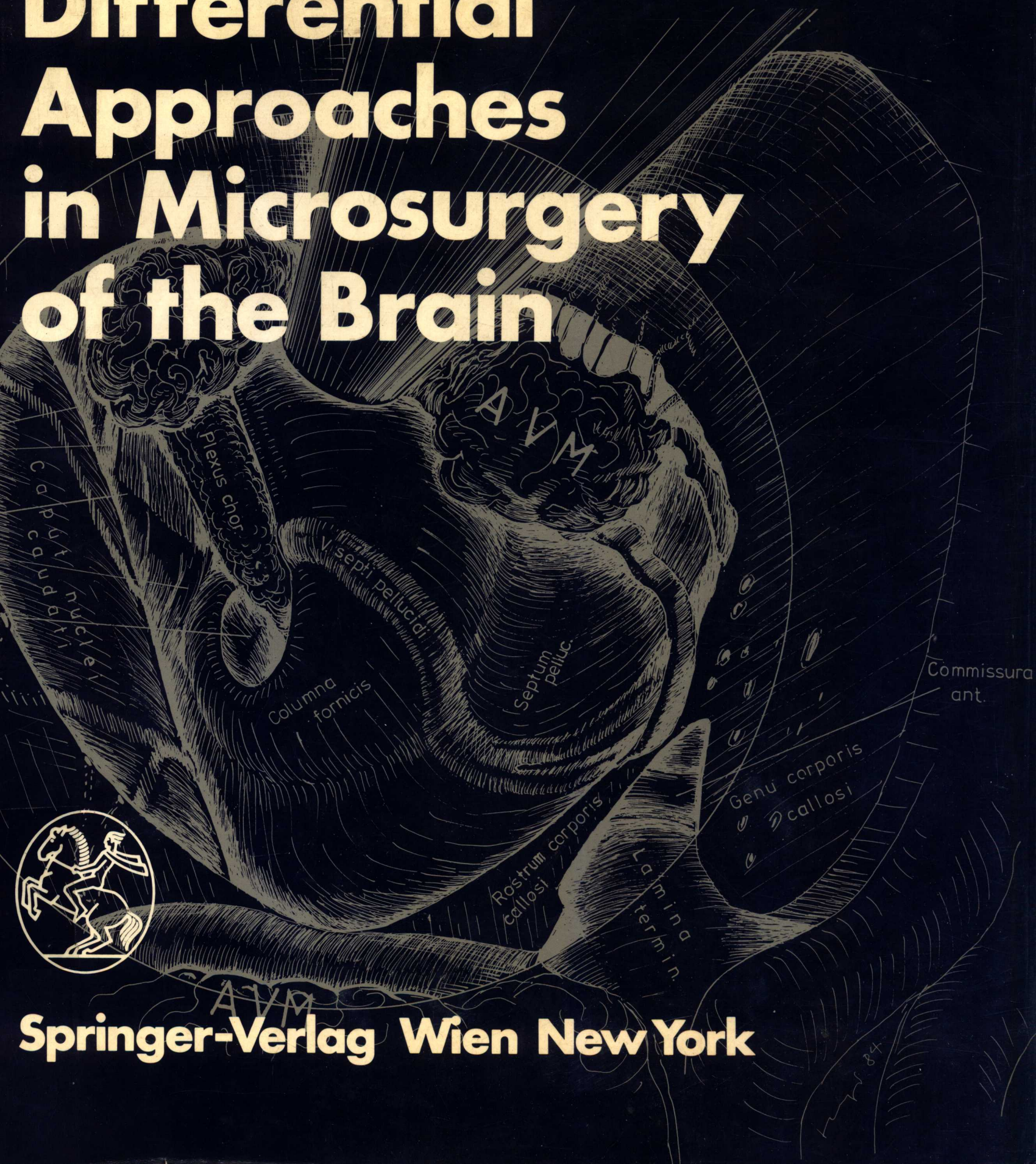


**Wolfgang Seeger**

# **Differential Approaches in Microsurgery of the Brain**



**Springer-Verlag Wien New York**



**Wolfgang Seeger**

**Differential  
Approaches  
in Microsurgery  
of the Brain**

**In Collaboration with W. Mann**



**Springer-Verlag Wien New York**

Prof. Dr. med. WOLFGANG SEEGER  
Medical Director of the Department of General Neurosurgery  
and Chairman of Neurosurgery of the Neurosurgical Clinic

Prof. Dr. med. WOLF MANN  
Ear, Nose and Throat Clinic

University of Freiburg i. Br., Federal Republic of Germany

With 201 Figures

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Part I

# General Remarks

(Figs. 1 to 5)

## Chapter 1

# **General Remarks** (Figs. 1 to 5)

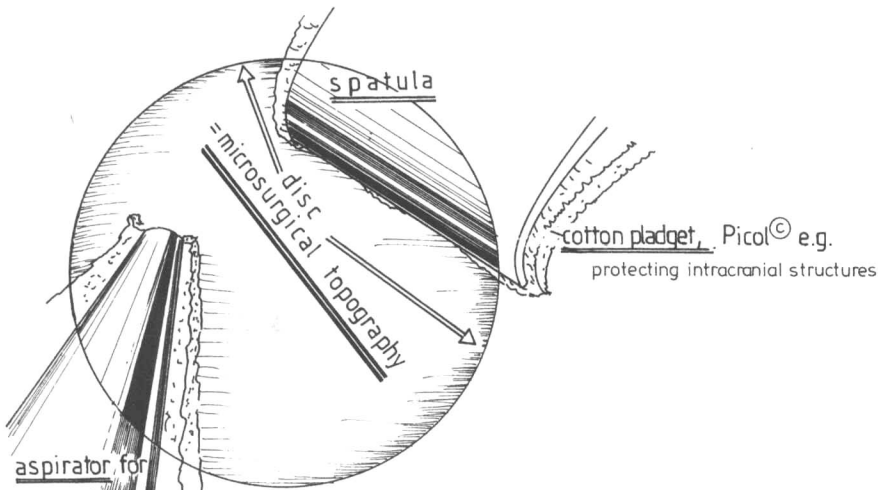
Fig. 1



alternatives A, B, and C  
of surgical approaches

①  
②  
③  
④  
⑤

sequence of operative procedures  
(in microsurgical topography  
+ anatomical models simulating operation)



-retraction  
(brain, tumor,  
AVM, aneurysm,  
nerves, vessels,  
Dura, Arachn.)

low aspiration  
power

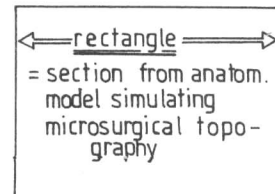
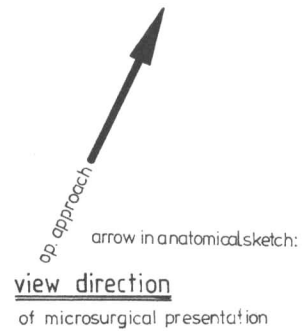
-fixation of  
tumor during  
hollowing

high aspiration  
power

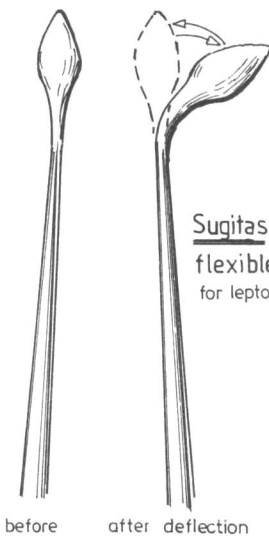
-suction

variable aspiration  
power

be  
careful



84



Sugita  
flexible dissector  
for leptomeninges e.g.

3 types of  
forceps

- for dissection
- for bipolar coagulation

techniques  
and symbolic presentations  
often used in this book

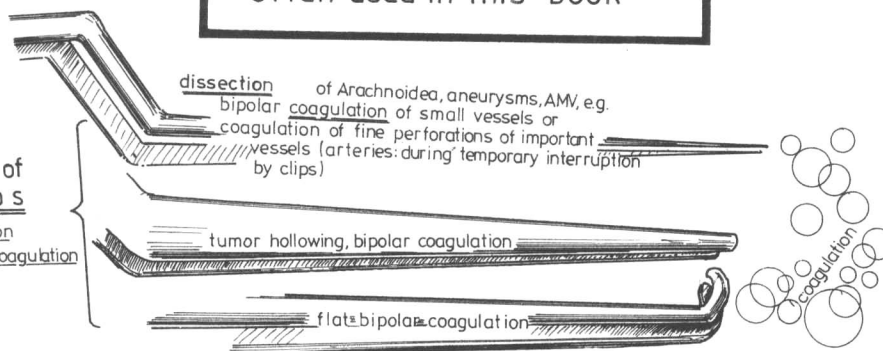


Fig. 2

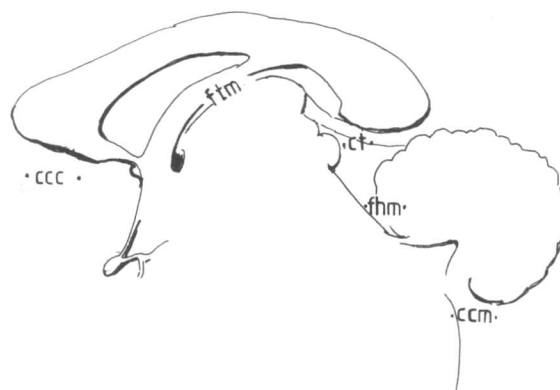


## dorsal CSF – spaces close to the brainstem

anterior segment: Cisterna corporis callosi (rostral area) •ccc•  
- Chapter 2 -

middle segment: Fiss. transversa (medial area) •ftm•  
Cisterna tecti •ct•  
Fiss. horizontalis (medial area) •fhm•  
- Chapter 3 -

posterior segment: Cisterna cerebellomedull. •ccm•  
- Chapter 4 -

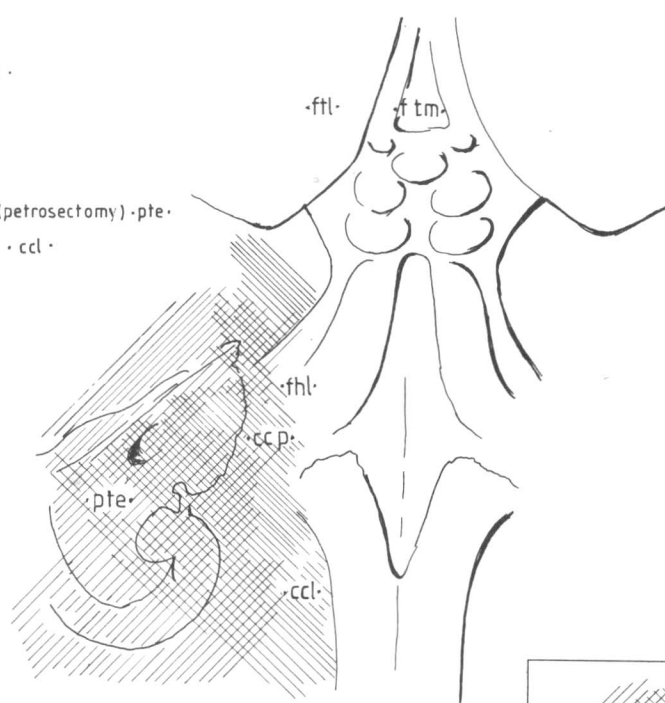


## lateral CSF-spaces

(anterior segment: Sylvian fissure)

middle segment: Fiss. transversa (lateral area) •ftl•  
Cisterna ambiens •cam•  
Fiss. horizontalis lateral area •fhl•  
- Chapter 5 -

posterior segment: Cisterna cerebellopontina •ccp•  
neurosurgical + otological aspects (petrosectomy) •pte•  
Cisterna cerebellomedullaris lat. •ccl•  
- Chapter 6 -



## basal CSF-spaces

anterior segment: Cisterna opt. + frontal base/Cavum nasi •cof• / •can•  
neurosurgical + otorhinological aspects  
- Chapter 7 -

middle segment: Cisterna interpeduncularis •cip•  
Cisterna pontis (rostral area) •cpr•  
neurosurgical + otorhinological aspects •fca•  
(faciocranial approach)  
- Chapter 8 -

posterior segment: Cisterna pontis (caudal area) •cpc•  
Cisterna praemedullaris •cpm•



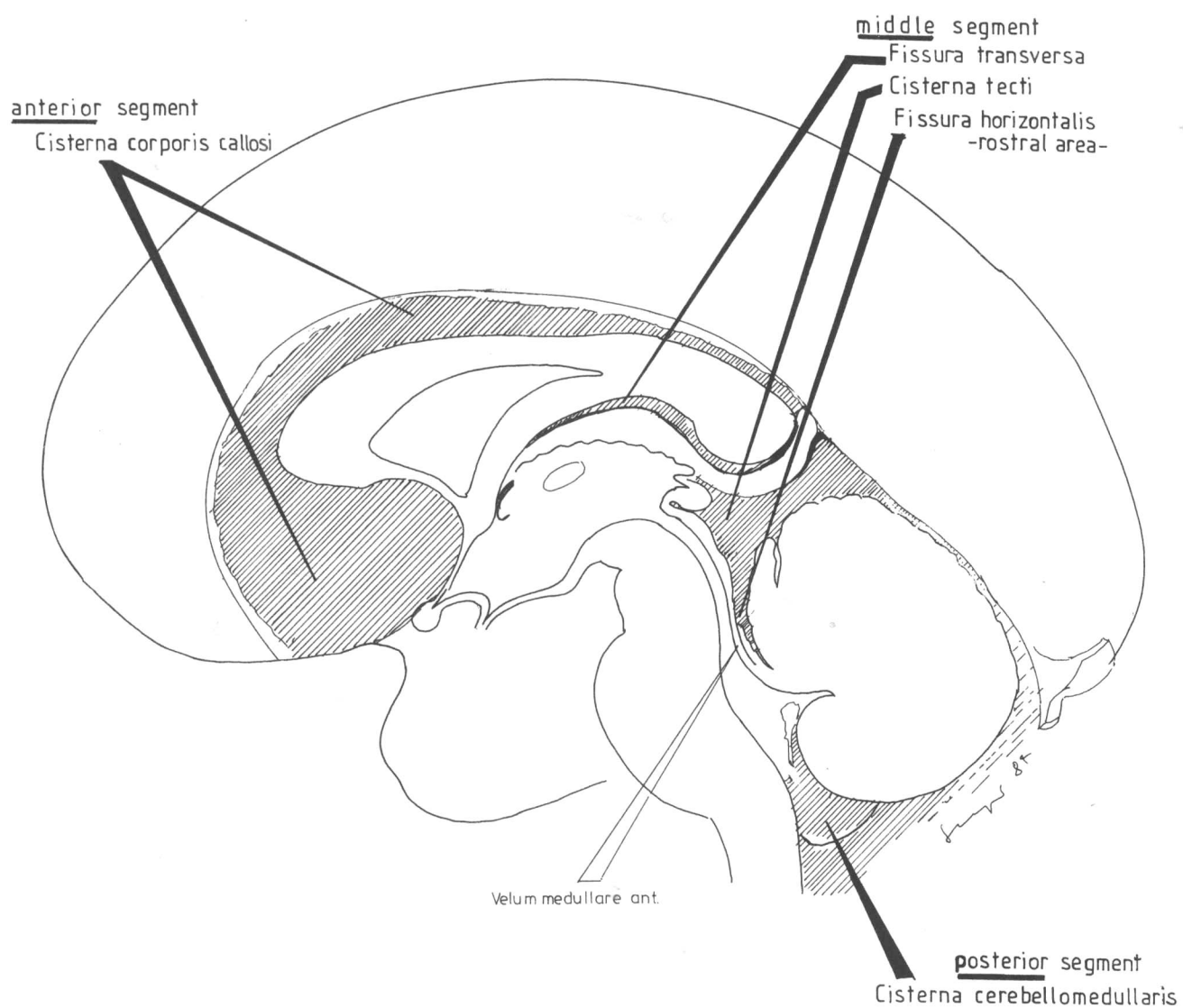
Otorhinology  
+ Neurosurgery  
combined

preformed CSF-spaces for approaches  
described in this book

Fig. 3. Dorsal CSF spaces of brainstem. The basal portions of the **cisterns of the Corpus callosum** are also considered dorsal, since they are situated dorsal from the Chiasma and Lamina terminalis and thus dorsal from the 3rd ventricle

**The anterior and middle cistern** regions merge into one another. The middle region (Fissura horizontalis cerebelli, rostral area) and the **posterior region** (Cisterna cerebello-medullaris) are separated by the 4th ventricle. The 4th ventricle connects with the Cisterna cerebello-medullaris over the Apertura mediana (Magendi). The 4th ventricle is **separated** from the Fissura horizontalis cerebelli and the Cisterna tecti only by the very thin Velum medullare ant., which pathological processes can destroy. In such cases, contact is produced during surgery between the Cisterna tecti, the Fissura horizontalis cerebelli (rostral area), the 4th ventricle, and the Cisterna cerebello-medullaris

**Tumors and vascular deformations can spread from one CSF area into the other and frequently do not respect the boundaries between the anterior, middle, and posterior cranial fossa**



d o r s a l CSF - spaces close to the brainstem  
- cisterns and fissures -

Fig. 4. Comparison of the lateral and dorsal CSF spaces

**Anterior segment:** Only the dorsal (and basal) CSF spaces are present

**Middle segment:** Fissura transversa in the area of the Trigonum is very wide

The Cisterna ambiens extends from the Cisterna tecti to the basal cistern area

The Fissura horizontalis cerebelli extends from the N. trigeminus to the midline and surrounds the middle and superior cerebellar peduncle (Brachium pontis and Brachium conjunctivum), as well as the Velum medullare ant. Because of the various operative approaches possible, a medial and lateral region had to be differentiated.\*

**Posterior segment:** The lateral cistern region is formed dorsolateral from the Cisterna cerebellopontina and basolateral from the Cisterna ponto-medullaris lateralis. A double-layered arachnoid membrane between the two cisterns covers the cranial nerves IX to XI. This arachnoid membrane has to be preserved in cases of acoustic neurinomas. The membrane adheres to the Plexus chor. of the Recessus lateralis with the so-called Foramen Luschkae (which may be closed)

**The exact knowledge of the construction of the Arachnoidea of the brain is an essential condition for operating in the vicinity of the brainstem**

---

\* For some authors, only the Fissura horizontalis in its posterior portion, which lies between the Lobulus semilunaris sup. and the Lobulus biventer and which laterally extends to the Flocculus. The Fissura, however, continues on up in front and becomes deepest between the Velum medullare ant. and the Lobulus centralis cerebelli.

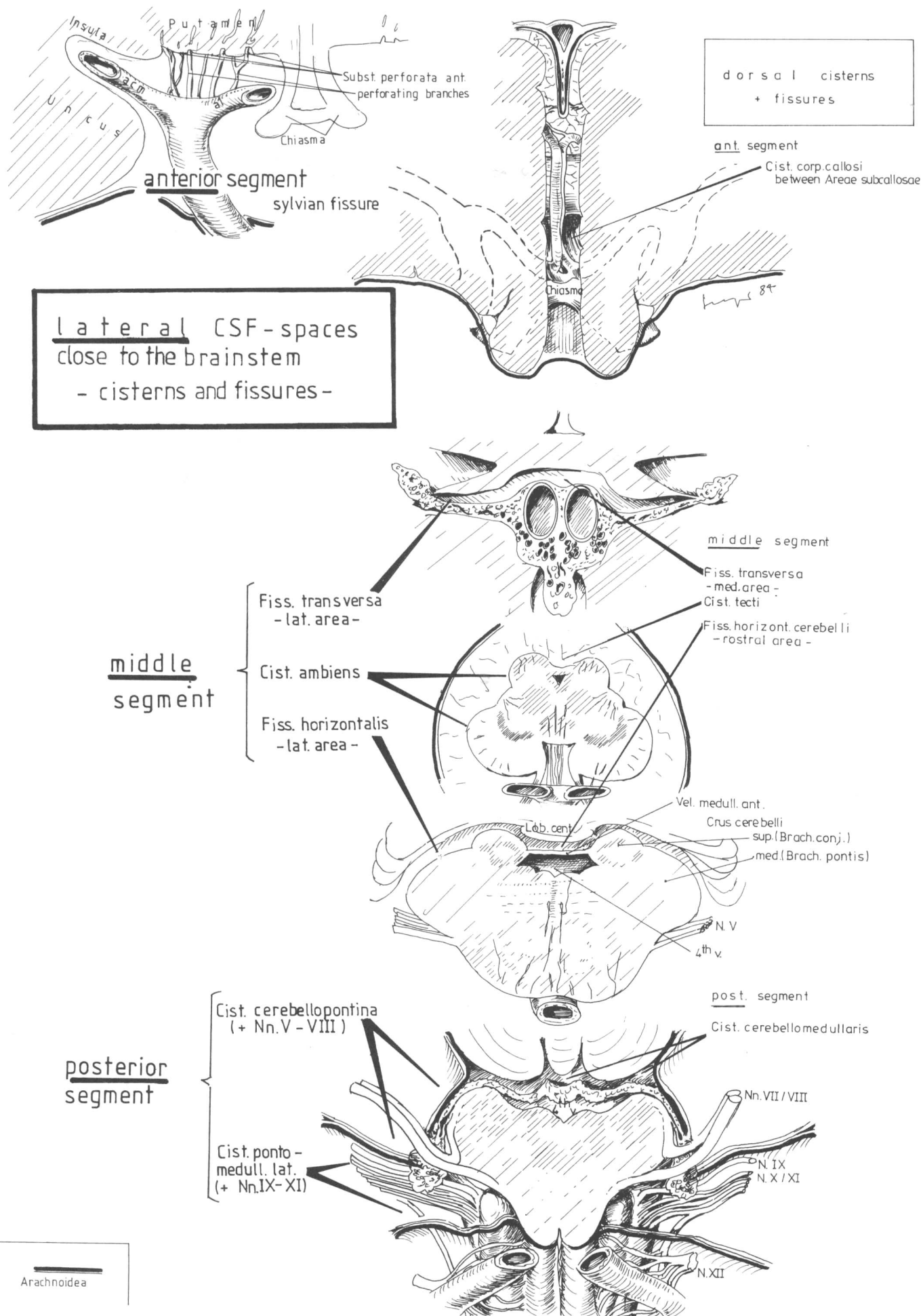




Fig. 5. Comparison of dorsal and basal cisterns

**Dorsal CSF spaces:**

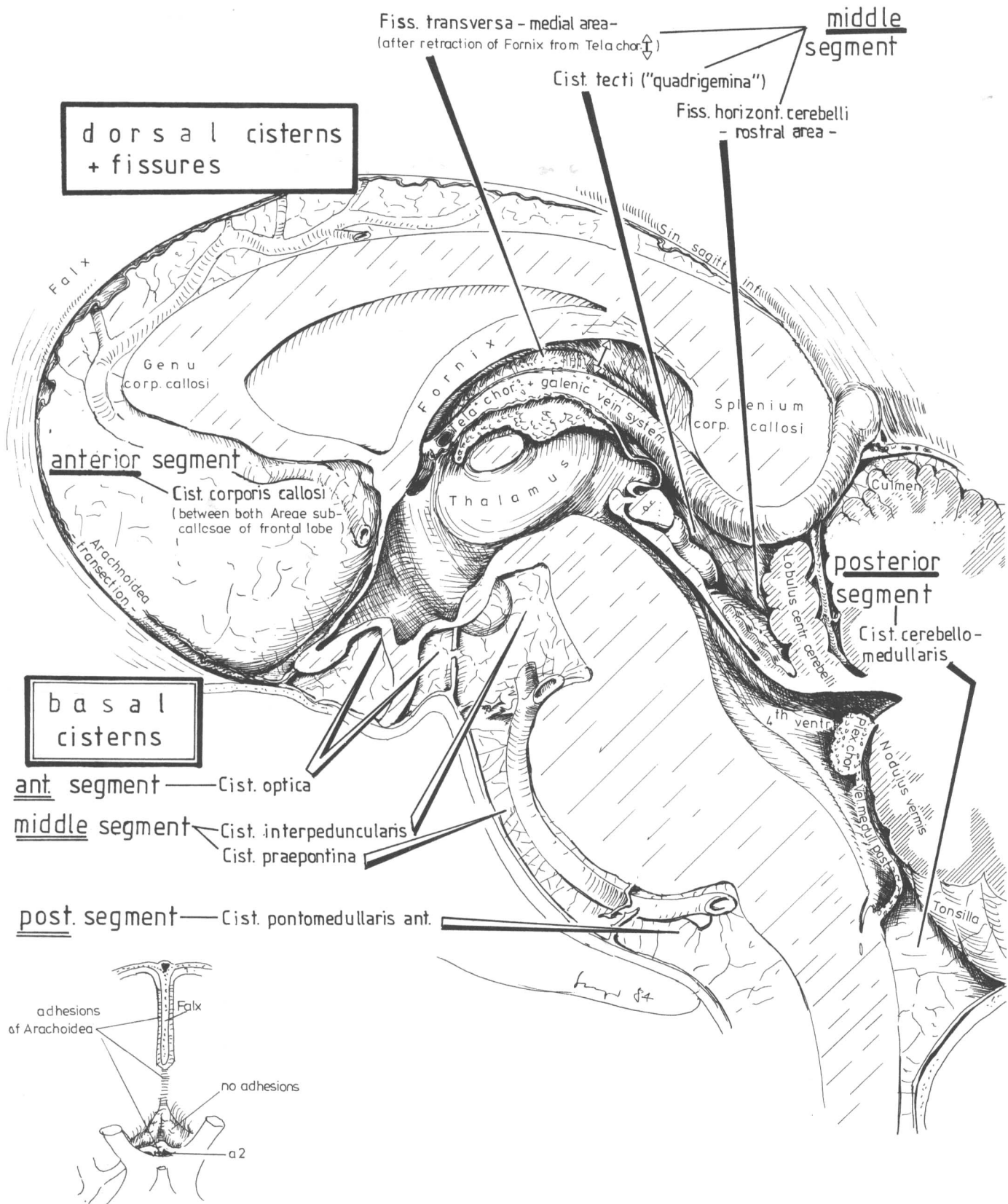
**Anterior segment** = Cisterna corporis callosi.

Adhesions may severely restrict the CSF fissure up to as far as the margin of the Falx

**Middle segment:** The Fissura transversa is usually narrow. Whenever this CSF space is opened, the Fornix and the Tela chorioidea are pushed away from each other, as is shown in the illustration (see double-pointed arrow). The Tela chorioidea of the 3rd ventricle is covered by a thin arachnoid layer, which guards the hypervascularized surroundings of the inner cerebral veins from surgical manipulation. There are no or only few vessels between the Tela chorioidea and the Fornix. On both sides of the V. magna Galeni there are small connections between the Fissura transversa and the Cisterna tecti

**Posterior segment** = Cisterna cerebello-medullaris

**Basal cisterns:** This cistern region is the most familiar, since most operations are performed there. All of the cisterns are separated from one another by gappy arachnoid membranes. For this reason, the arachnoid membranes between the various cisterns always have to be covered with cotton wool during surgery (if the operation is not extended to a neighboring cistern) to minimize the blood admixtures of the cisternal CSF





Part II

# **Special Microsurgical Aspects**

(Figs. 6 to 201)