

# Contents

## 1 Basics and Evolution of Endoneurosurgery

Introduction .....	1
Evolution of Neurosurgery.....	1
Imaging of Individual Anatomy .....	2
Planning an Individual Approach.....	3
Technical Solution Steps.....	4
Ergonomic Problems in Neurosurgery.....	5
History of Transendoscopic Sonography .....	5
Endoscopy .....	5
Neurosonography .....	7
Transendoscopic Sonography .....	7
Technique and Equipment .....	7
3D Sonography .....	11
Artifacts.....	11
Imaging Problems .....	13
Safety .....	13

## 2 Anatomy

Laboratory Work .....	15
Effect of Imaging Characteristics on Anatomical Representation .....	16
Zoom Effect and Change of Volume .....	21
Illustrative Anatomical Cases .....	21
Summary Remarks on ENS Anatomy .....	45

---

### **3 Clinical Application**

Objective .....	47
Materials and Methods .....	47
Results .....	48
Ergonomics in the Operating Room .....	48
General Remarks and List of Lesions .....	49
Cystic Lesions .....	68
Colloid Cyst.....	72
Tumors.....	74
Sellar Region .....	76
Transnasal Approach to Sellar Region .....	82
Posterior Fossa .....	87
Vascular Lesions .....	94
Lesions Examined.....	102
Resection Control, Targeting and Navigation ..	102
Summary and Final Reflections .....	105
Indications.....	106
Conclusions .....	109

---

### **4 ENS Clips**

Laboratory Work: Setting .....	111
Anatomical Cases (with PIP) .....	112
Ventriculoscopy .....	112
Suprasellar Space.....	112
Fourth Ventricle.....	112
3-D Reconstructions .....	113
Clinical Cases 1-11 .....	113

## **5 Future Concepts for Minimally Invasive Techniques in Neurosurgery**

Theoretical environment of ENS .....	119
Intelligent Interface:	
Human-Technical System .....	119
Ergonomic Trauma and Ergonomic Zones ..	124
Intuitive Operability .....	126
Interactive Operability .....	130
Intelligent Human-Machine Interfaces with Consistent Ergonomic Realization .....	131
Precision Integrated with Complexity .....	131
Microtechnique $\Rightarrow$ Microsystem Technique (Miniaturization) .....	132
Final Reflections .....	134

<b>Contents</b>	
<b>References</b>	139
<b>Subject Index</b>	145

## Contents

Introduction .....	1
Evolution of Neurosurgery.....	1
Imaging of Individual Anatomy .....	2
Planning an Individual Approach.....	3
Technical Solution Steps.....	4
Ergonomic Problems in Neurosurgery.....	5
History of Transendoscopic Sonography.....	5
Endoscopy.....	5
Neurosonography .....	7
Transendoscopic Sonography .....	7
Technique and Equipment.....	7
3D Sonography.....	11
Artifacts.....	11
Imaging Problems .....	13
Safety.....	13

## **Contents**

Laboratory Work .....	15
Effect of Imaging Characteristics on Anatomical Representation .....	16
Zoom Effect and Change of Volume .....	21
Illustrative Anatomical Cases .....	21
Summary Remarks on ENS Anatomy .....	45

## **Contents**

Objective.....	47
Materials and Methods.....	47
Results.....	48
Ergonomics in the Operating Room .....	48
General Remarks and List of Lesions .....	49
Cystic Lesions.....	68
Colloid Cyst .....	72
Tumors .....	74
Sellar Region .....	76
Transnasal Approach to Sellar Region .....	82
Posterior Fossa .....	87
Vascular Lesions .....	94
Lesions Examined .....	102
Resection Control, Targeting and Navigation .....	102
Summary and Final Reflections .....	105
Indications .....	106
Conclusions .....	109

## Contents

Laboratory Work: Setting.....	111
Anatomical Cases (with PIP).....	112
Ventriculoscopy .....	112
Suprasellar Space.....	112
Fourth Ventricle.....	112
3-D Reconstructions .....	113
Clinical Cases 1–11 .....	113

## Contents

Theoretical environment of ENS .....	119
Intelligent Interface: Human–Technical System .....	119
Ergonomic Trauma and Ergonomic Zones .....	124
Intuitive Operability .....	126
Interactive Operability .....	130
Intelligent Human–Machine Interfaces with Consistent Ergonomic Realization .....	131
Precision Integrated with Complexity .....	131
Microtechnique $\Rightarrow$ Microsystem Technique (Miniaturization) .....	132
Final Reflections .....	134