

# Contents

<b>1 General Features of Acoustic Neurinomas</b> . . . . .	1	Drills . . . . .	35
Pathogenesis . . . . .	1	Bipolar Coagulation . . . . .	36
Epidemiology . . . . .	1	Microinstruments . . . . .	37
Natural History . . . . .	1	<b>Postoperative Management</b> . . . . .	38
Signs and Symptoms . . . . .	1	Postoperative Medication . . . . .	38
Hearing Loss . . . . .	1	Discharge . . . . .	39
Tinnitus . . . . .	2		
Disequilibrium . . . . .	2	<b>5 Surgery in the Cerebellopontine Angle: General Concepts</b> . . . . .	40
Cerebellar Dysfunction . . . . .	2	<b>Surgical Orientation in the Cerebellopontine Angle</b> . . . . .	40
Trigeminal Nerve Involvement . . . . .	2	Internal Auditory Canal . . . . .	40
Facial Nerve Involvement . . . . .	2	Cerebellopontine Angle . . . . .	41
Lower Cranial Nerve and Brainstem Findings . . . . .	2	Facial Nerve . . . . .	43
Hydrocephalus and Headaches . . . . .	3	<b>Surgical Techniques in the Cerebellopontine Angle</b> . . . . .	44
		General Guidelines for Drilling . . . . .	44
<b>2 Imaging Study of Acoustic Neurinomas</b> . . . . .	4	Management of Bleeding . . . . .	44
<b>Tumor Assessment</b> . . . . .	4	How to Deal with Brain Tissue and Other	
Magnetic Resonance Imaging . . . . .	4	Neurovascular Structures . . . . .	45
Computed Tomography . . . . .	15	How to Obtain Better Access to the Tumor . . . . .	46
<b>Differential Diagnosis</b> . . . . .	15	Techniques of Tumor Dissection and Removal . . . . .	47
Neurofibromatosis Type 2 . . . . .	15		
Other Tumors . . . . .	16	<b>6 Intraoperative Monitoring</b> . . . . .	52
Residual Tumors . . . . .	18	<b>Facial Nerve Monitoring</b> . . . . .	52
<b>Therapeutic Follow-Up</b> . . . . .	22	Introduction . . . . .	52
Postoperative Scans . . . . .	22	Instrumentation . . . . .	52
Wait and Scan . . . . .	22	Techniques . . . . .	53
		Purposes of Intraoperative Facial Nerve Monitoring . . . . .	54
<b>3 Decision Making in Acoustic Neurinoma Surgery</b> . . . . .	25	Localization of the Facial Nerve (Mapping) . . . . .	54
<b>Introduction</b> . . . . .	25	Identification of the Facial Nerve . . . . .	54
<b>Surgical versus Nonsurgical Treatment</b> . . . . .	25	Minimization of Neural Trauma . . . . .	55
Small Neurinomas . . . . .	25	Artifacts . . . . .	55
Acoustic Neurinoma in the Only Hearing Ear . . . . .	25	Confirmation of the Functional Integrity of the Nerve . . . . .	56
Acoustic Neurinoma in Patients with Poor General		Concluding Considerations . . . . .	56
Condition . . . . .	26	<b>Cochlear Nerve Monitoring</b> . . . . .	56
<b>Radiosurgery</b> . . . . .	26	Introduction . . . . .	56
<b>Management of the Patient with Serious</b>		Protocol . . . . .	56
Neurological Disorders . . . . .	26	Concluding Considerations . . . . .	59
<b>Management of Elderly Patients</b> . . . . .	26		
<b>Selecting the Surgical Approach</b> . . . . .	27	<b>7 The Translabyrinthine Approaches</b> . . . . .	60
Translabyrinthine versus Hearing Preservation Surgeries . . . . .	27	<b>The Enlarged Translabyrinthine Approach</b> . . . . .	60
Total versus Subtotal Removal . . . . .	29	Rationale . . . . .	60
		Indications . . . . .	60
<b>4 Operating Room Setup and Patient Care</b> . . . . .	31	Contraindications . . . . .	60
<b>Operation Room Setup</b> . . . . .	31	Surgical Anatomy . . . . .	60
Rationale . . . . .	31	Surgical Technique . . . . .	61
Arrangement . . . . .	31	Clinical Application . . . . .	86
<b>Instruments</b> . . . . .	35	Pearls and Pitfalls . . . . .	89
Suction Irrigation . . . . .	35	Summary . . . . .	92

<b>Enlarged Translabyrinthine Approach with Transapical Extension</b> . . . . .	93	<b>10 Transcochlear Approaches</b> . . . . .	205
Rationale . . . . .	93	Introduction . . . . .	205
Indications . . . . .	94	Transotic Approach . . . . .	205
Limitations . . . . .	94	Rationale . . . . .	205
Surgical Anatomy (Right Ear) . . . . .	94	Indications . . . . .	205
Surgical Technique . . . . .	94	Contraindications . . . . .	205
Clinical Application . . . . .	98	Surgical Anatomy (Right Ear) . . . . .	206
Pearls and Pitfalls . . . . .	113	Surgical Steps of the Blind-Sac (Cul-de-Sac) Closure (Left Ear) . . . . .	208
Summary . . . . .	113	Surgical Techniques . . . . .	210
<b>Special Considerations in the Translabyrinthine Approach</b> . . . . .	114	Clinical Application . . . . .	213
Anatomical Variations . . . . .	114	Pearls and Pitfalls . . . . .	231
Management of Surgical Mishaps . . . . .	123	Summary . . . . .	232
Management of Nerves and Vessels around the Tumor . . . . .	124	<b>Modified Transcochlear Approach</b> . . . . .	232
Specific Characteristics of the Tumor . . . . .	136	Rationale . . . . .	232
Pearls and Pitfalls . . . . .	140	Indication . . . . .	232
<b>8 Combined Retrosigmoid–Retrolabyrinthine Approach</b> . . . . .	142	Contraindications . . . . .	232
Rationale . . . . .	142	Surgical Anatomy (Right Ear) . . . . .	232
Indications . . . . .	142	Surgical Technique . . . . .	235
Contraindications . . . . .	143	Clinical Application . . . . .	236
Surgical Anatomy . . . . .	143	Pearls and Pitfalls . . . . .	243
Surgical Dissection Demonstrating the Combined Retrosigmoid–Retrolabyrinthine Approach (Left Ear) . . . . .	143	Summary . . . . .	243
Surgical Techniques . . . . .	148	<b>11 Management in Special Situations</b> . . . . .	244
Access to the Tumor (Right Ear) . . . . .	148	<b>Current Strategy for Neurofibromatosis Type 2: Total Removal with a Concomitant Cochlear or Brainstem Implant</b> . . . . .	244
Tumor Removal (Left Ear) . . . . .	150	Neurofibromatosis Type 2 . . . . .	244
Clinical Application . . . . .	155	Clinical Diagnosis . . . . .	244
Pearls and Pitfalls . . . . .	172	Clinical Manifestations of Disease . . . . .	245
Summary . . . . .	175	Management . . . . .	245
Advantages . . . . .	175	Decision Making . . . . .	247
Disadvantages . . . . .	175	Brainstem Implantation in Neurofibromatosis Type 2 . . . . .	248
Limitations . . . . .	175	Clinical Application . . . . .	251
<b>9 Enlarged Middle Cranial Fossa Approach</b> . . . . .	176	<b>Management of Acoustic Neurinoma in the Only Hearing Ear</b> . . . . .	263
Rationale . . . . .	176	Strategy . . . . .	263
Indications . . . . .	176	Clinical Application . . . . .	264
Contraindications . . . . .	176	<b>Summary of Auditory Brainstem Implants</b> . . . . .	266
Surgical Anatomy . . . . .	176	Pearls and Pitfalls . . . . .	266
Technique for Identification of the Internal Auditory Canal . . . . .	178	<b>12 Facial Nerve Reanimation</b> . . . . .	268
House's Method . . . . .	178	Introduction . . . . .	268
Fisch's Method (Meatal Plane Approach) . . . . .	178	Indications . . . . .	268
Garcia-Ibanez's Method . . . . .	179	End-to-End Anastomosis . . . . .	268
Our Method . . . . .	179	Keys to Successful Results . . . . .	268
Surgical Dissection Demonstrating the Middle Cranial Fossa Approach (Left Ear) . . . . .	180	Interposition Graft . . . . .	270
Surgical Techniques . . . . .	184	Clinical Application . . . . .	270
Special Positioning . . . . .	184	Harvesting the Sural Nerve Graft . . . . .	282
Surgical Steps up to the Internal Auditory Canal (Right Ear) . . . . .	184	<b>Hypoglossofacial Nerve Anastomosis</b> . . . . .	283
Exposure of the Internal Auditory Canal (Right Ear) . . . . .	187	Anatomy of the Hypoglossal Nerve . . . . .	283
Tumor Removal (Right Ear) . . . . .	189	Surgical Approach . . . . .	283
Closure (Right Ear) . . . . .	190	Pearls and Pitfalls . . . . .	285
Clinical Application . . . . .	192		
Pearls and Pitfalls . . . . .	201		
Summary . . . . .	204		
Advantages . . . . .	204		
Disadvantages . . . . .	204		
Limitations . . . . .	204		

<b>13 The Role of Endoscopy in Acoustic Neurinoma Surgery</b> . . . . .	286	Cerebrospinal Fluid Leakage . . . . .	298
<b>Introduction</b> . . . . .	286	Meningitis . . . . .	299
<b>Instruments</b> . . . . .	286	Brain Edema . . . . .	299
<b>Sterilization</b> . . . . .	286	Cranial Nerve Defects . . . . .	299
<b>Endoscopic Surgical Anatomy</b> . . . . .	286	Ataxia . . . . .	300
From the Posterior Aspect of the Temporal Bone:		Hydrocephalus . . . . .	300
Retrosigmoid Approach . . . . .	286	Air Embolism . . . . .	300
Through the Superior Surface of the Temporal Bone:		Pneumocephalus . . . . .	300
Middle Fossa Approach . . . . .	288	Headaches . . . . .	300
<b>The Technique of Endoscopy</b> . . . . .	289	Postoperative Unsteadiness . . . . .	300
<b>Applications</b> . . . . .	289	Tinnitus . . . . .	300
Translabyrinthine Approach . . . . .	289	<b>Nonspecific Complications</b> . . . . .	300
Retrosigmoid Approach . . . . .	293	Atelectasis and Pneumonia . . . . .	300
Enlarged Middle Fossa Approach . . . . .	293	Deep Venous Thrombosis and Pulmonary Embolism . . . . .	301
<b>Risks of Cerebellopontine Angle Endoscopy</b> . . . . .	294	Wound Infection and Hematoma . . . . .	301
		Transfusion . . . . .	301
 <b>14 Complications and Management</b> . . . . .	295	 <b>Bibliography</b> . . . . .	303
<b>Introduction</b> . . . . .	295	 <b>Index</b> . . . . .	305
<b>Postoperative Complications Specific to Cerebellopontine</b>			
<b>Angle Surgery</b> . . . . .	295		
Hemorrhage . . . . .	295		
Infarction . . . . .	296		