

Contents

1 Operating Room Setup	1	5 The Translabyrinthine Approaches	34
Operating Room Arrangement	1	The Enlarged Translabyrinthine Approach	34
The Patient Position and the Operating Room	2	Rationale	34
Monitoring	2	Indications	34
Preparation of the Operative Site	2	Contraindications	34
Surgeon's Position	3	Surgical Anatomy	34
Microscope	3	Surgical Technique	34
Instruments	3	Clinical Application	41
Suction Irrigation	3	Pearls and Pitfalls	44
Drills	3	Advantages	44
Bipolar Coagulation	4	Disadvantages	44
Microinstruments	5	The Enlarged Translabyrinthine Approach with	
Postoperative Care	6	Transapical Extension	47
2 Special Considerations in Skull Base Surgery	8	Rationale	47
Introduction	8	Indications	47
General Guidelines for Drilling	8	Limitations	47
Management of Bleeding	8	Surgical Technique	47
Monopolar Coagulation	8	Clinical Applications	50
Bipolar Coagulation	8	Pearls and Pitfalls	71
Bleeding from Bony Surfaces	9	Advantages	71
Gelatin Sponge	9	Disadvantages	71
Oxidized Cellulose and Oxidized Regenerated Cellulose ...	9	Brainstem Implantation	72
How to Deal with Brain Tissue and Other		Absolute Indications	72
Neurovascular Structures	9	Relative Indications	72
Techniques of Tumor Dissection and Removal	10	Clinical Application	72
How to Widen the Access to the Tumor	11	6 The Transcochlear Approaches	80
3 Radiology of the Lateral Skull Base	13	Introduction	80
Introduction	13	The Transotic Approach	80
Intradural Lesions (Cerebellopontine Angle)	13	Rationale	80
Extra-axial Lesions	13	Indications	80
Intra-axial Lesions	19	Surgical Technique	80
Skull Base Tumors Extending into the Cerebellopontine		Surgical Anatomy after Opening the Dura	80
Angle	21	Clinical Application	84
Extradural Lesions	21	Pearls and Pitfalls	88
Petrous Apex Lesions	21	Advantages	88
Clival Lesions	23	Disadvantages	88
Jugular Foramen Tumors	24	The Modified Transcochlear Approaches	89
4 Introduction to Lateral Skull Base Surgery	30	Classification	89
Classification of the Lateral Skull Base Approaches	30	Type A Modified Transcochlear Approach	
Surgical Anatomy	30	(The Basic Type)	89
Surgical Anatomy of the Temporal Bone as Related to		Indications	89
Lateral Skull Base Surgery	30	Surgical Technique (Right Side)	89
Surgical Anatomy of the Posterior Cranial Fossa	32	Surgical Anatomy after Opening the Dura	92
		Closure	92
		Clinical Applications	93
		Pearls and Pitfalls	115
		Advantages	115
		Disadvantages	115

Type B Modified Transcochlear Approach	117	Disadvantages	202
Indications	117	Combinations with the POTS Approach	203
Surgical Steps	117	Clinical Application	203
Clinical Application	119		
Pearls and Pitfalls	119	9 Approaches to the Infratemporal Fossa	206
The Type C Modified Transcochlear Approach	120	Infratemporal Fossa Approach Type B	206
Indications	120	Rationale	206
Surgical Steps	120	Indications	206
Clinical Application	122	Surgical Anatomy	206
The Type D Modified Transcochlear Approach	125	Surgical Technique (Left Side)	207
Indications	125	Clinical Applications	210
Surgical Steps	125	Advantages	216
Clinical Application	126	Disadvantages	216
		Limitations	216
		Infratemporal Fossa Approach Type C	217
7 The Middle Fossa Approaches	130	Rationale	217
Classification	130	Indications	217
Indications	131	Surgical Anatomy	217
Surgical Anatomy	131	Surgical Technique	218
Special Positioning	133	Clinical Applications	220
Surgical Technique	133	Pearls and Pitfalls	228
Surgical Anatomy after Opening of the Dura	137	Advantages	229
Closure	137	Disadvantages	229
Clinical Applications	138	Limitations	229
Pearls and Pitfalls	145	The Group of Preauricular Transzygomatic Approaches	230
		Type D Infratemporal Fossa Approach	230
		Preauricular Infratemporal Transzygomatic Approach	230
		Preauricular Frontotemporal Orbitozygomatic Approach ..	230
		Indications for the Preauricular Infratemporal Transzygomatic Approaches	230
		Surgical Anatomy	230
		Surgical Technique	231
		Clinical Applications	235
		Pearls and Pitfalls	246
		Advantages	246
		Disadvantages	246
		10 The Retrosigmoid Retrolabyrinthine Approach	248
		Rationale	248
		Indications	248
		Surgical Anatomy	248
		Surgical Technique	249
		Surgical Anatomy after Opening the Dura	252
		Clinical Applications	253
		Pearls and Pitfalls	263
		Advantages	264
		Disadvantages	264
		11 The Extreme Lateral Approach (Far Lateral, Transcondylar)	265
		Rationale	265
		Indications	265
		Surgical Anatomy	265
		Surgical Technique	268
		Surgical Anatomy after Opening the Dura	271
		Closure	271
		Clinical Application	272
		Pearls and Pitfalls	275
8 Approaches to the Jugular Foramen	147		
Infratemporal Fossa Approach Type A	147		
Rationale	147		
Indications	147		
Surgical Anatomy	148		
Surgical Technique	148		
Special Considerations	156		
Removal of a Left Tumor with Invasion of the Inner Ear	156		
Sacrifice of the Internal Carotid Artery	157		
Removal of Tumors with Invasion of the Left Internal Auditory Canal	158		
Facial Nerve Involvement	158		
Presence of Ipsilateral Carotid Body Tumor	160		
Single-stage Removal of Tumor with Small Intradural Extension (C3Di1)	160		
Staged Removal of Tumors with Intradural Extension	160		
Petro-occipital Transsigmoid Approach for Second-stage Removal of Intradural Glomus Tumors	161		
Staged Removal of C3Di2 Glomus Tumor (Right Side) ..	166		
Pearls and Pitfalls	176		
The Petro-Occipital Transsigmoid (POTS) Approach	179		
Rationale	179		
Indications	179		
Contraindications	179		
Surgical Anatomy	179		
Surgical Technique	182		
Surgical Anatomy after Opening the Dura	186		
Clinical Applications	187		
Pearls and Pitfalls	199		
Results	202		
Advantages	202		

12 Combined Approaches	277	Nonsurgical Lesions	345
Introduction	277	Meckel's Cave Area	346
Retrolabyrinthine Subtemporal Transapical and Retrolabyrinthine Transtentorial Approaches	277	Special Considerations	348
Rationale	277	Staging	348
Indications	277	Total vs. Subtotal Removal	349
Surgical Anatomy	278	When Not To Do Surgery	349
Surgical Technique	279		
Retrolabyrinthine Subtemporal Transapical (Transpetrous Apex) Approach	279	14 General Principles of Embolization in Skull Base Tumors	350
Retrolabyrinthine Subtemporal Transtentorial Approach	281	Introduction	350
Clinical Applications	283	Embolization of Juvenile Nasopharyngeal Angiofibroma	351
Pearls and Pitfalls	292	Embolization of Glomus Tumors of the Temporal Bone	353
Combined Transpetrous Orbitozygomatic Approaches .	295	Embolization of Meningiomas of the Skull Base	354
Rationale	295		
Indications	295	15 Management of the Internal Carotid Artery in Skull Base Surgery	357
Approaches and Clinical Applications	295	Introduction	357
Combined Transcochlear Orbitozygomatic Approach ...	295	Surgical Anatomy	357
Combined Retrolabyrinthine Subtemporal Orbitozygomatic Approach	306	Pathologies	358
Combined Translabyrinthine Transapical Orbitozygomatic Approach	314	Normal Angiographic Anatomy of the Internal Carotid Artery and of the Circle of Willis	359
Combined Infratemporal Transzygomatic Approach	321	The Internal Carotid Artery	359
Pearls and Pitfalls for the Combined Transpetrous Orbitozygomatic Approaches	329	The Circle of Willis	360
Advantages of the Combined Transpetrous Orbitozygomatic Approaches	329	Preoperative Neuroradiological Assessment of the Internal Carotid Artery	362
Disadvantages	329	Interventional Neuroradiological Management of the Internal Carotid Artery	363
		Permanent Balloon Occlusion of the Internal Carotid Artery	363
13 Decision Making in Skull Base Surgery	330	Preoperative Stenting of the Internal Carotid Artery	368
Introduction	330	Surgical Management Modalities of the Internal Carotid Artery	372
Surgical Management	330	Skeletonization	372
Jugular Foramen Tumors	331	Displacement	372
Glomus Jugular Tumors (Chemodectomas)	331	Subperiosteal/Subadventitial Dissection	373
Lower Cranial Nerve Schwannoma	333	Dissection and Resection after Permanent Balloon Occlusion of the Internal Carotid Artery	373
Jugular Foramen Meningioma	333	Subadventitial Dissection after Reinforcement with Stenting	373
Cerebellopontine Angle Tumors	335	Clinical Application of Carotid Artery Stenting	375
Acoustic Neurinoma	335		
Meningioma	335	Literature	379
Epidermoids	338		
Clival and Petroclival Tumors	339	Index	387
Intradural Lesions	340		
Extradural Lesions	343		
Petrous Apex Lesions	344		
Cholesterol Granuloma	344		
Cholesteatoma	345		
Chordomas, Chondromas, and Chondrosarcomas	345		