

Advances in Neurosurgery 20



K. Pisco, M. Klinger, M. Brock (Eds.)

Neurosurgical Standards

Cerebral Aneurysms

Malignant Gliomas

With 164 Figures

Springer-Verlag

Berlin Heidelberg New York London Paris

Tokyo Hong Kong Barcelona Budapest

Proceedings of the 42th Annual Meeting
of the Deutsche Gesellschaft für Neurochirurgie
Bremen, May 5-8, 1991

Prof. Dr. Kurt Pisco
Neurochirurgische Klinik
Zentralkrankenhaus St.-Jürgen-Str.
W-2800 Bremen 1, FRG

Prof. Dr. Margareta Klinger
Neurochirurgische Klinik der Universität Erlangen-Nürnberg
Schwabachanlage 6 (Kopfkrinikum), W-8520 Erlangen, FRG

Prof. Dr. Mario Brock
Neurochirurgische Klinik und Poliklinik
Universitätskrinikum Steglitz, Freie Universität Berlin
Hindenburgdamm 30, W-1000 Berlin 45, FRG

ISBN-13:978-3-540-54838-6 e-ISBN-13:978-3-642-77109-5
DOI:10.1007/978-3-642-77109-5

Library of Congress Cataloging-in-Publication Data. Neurosurgical standards, cerebral aneurysms, malignant gliomas / K. Pisco, M. Klinger, M. Brock (eds.). p. cm. – (Advances in neurosurgery; 20) “Proceedings of the 42th Annual Meeting of the Deutsche Gesellschaft für Neurochirurgie, Bremen, May 5-8, 1991” – T.p. verso. Includes bibliographical references and index.

1. Intracranial aneurysms–Surgery–Standards–Congresses. 2. Gliomas–Surgery–Standards–Congresses. I. Pisco, Kurt. II. Klinger, M. (Margareta), 1943–. III. Brock, M. (Mario), 1938–. IV. Deutsche Gesellschaft für Neurochirurgie. Tagung 42th: 1991 : Bremen, Germany. V. Series. [DNLM: 1. Cerebral Aneurysm–surgery–congresses. 2. Glioma–therapy–congresses. 3. Cerebral Aneurysm–surgery–congresses. 4. Glioma–therapy–congresses. 5. Neurosurgery–standards–congresses. W1 AD684N v.20] RD594.2.N48 1992 617.4’81–dc20 DNLMDLC for Library of Congress 92-2145 CIP

This work is subject to copyright. All rights are reserved, whether the whole or part of the material is concerned, specifically the rights of translation, reprinting, reuse of illustrations, recitation, broadcasting, reproduction on microfilm or in any other way, and storage in data banks. Duplication of this publication or parts thereof is permitted only under the provisions of the German Copyright Law of September 9, 1965, in its current version, and permission for use must always be obtained from Springer-Verlag. Violations are liable for prosecution under the German Copyright Law.

© Springer-Verlag Berlin Heidelberg 1992

The use of general descriptive names, registered names, trademarks, etc. in this publication does not imply, even in the absence of a specific statement, that such names are exempt from the relevant protective laws and regulations and therefore free for general use.

Product liability: The publishers cannot guarantee the accuracy of any information about dosage and application contained in this book. In every individual case the user must check such information by consulting the relevant literature.

Typesetting: Springer T_EX in-house system

11/3130 - 5 4 3 2 1 0 – Printed on acid-free paper

Contents

President's Opening Remarks K. Písciol	1
Fedor Krause Memorial Lecture K.-A. Bushe (With 10 Figures)	3
 Neurosurgical Standards	
Neurosurgical Standards and Quality Assurance W.J. Bock	23
The Concept of Neurosurgical Standards from the Clinician's Perspective R. Wüllenweber	29
Medical Treatment Standards from a Legal Perspective H.L. Schreiber	34
 Cerebral Aneurysms	
Endovascular Treatment of Berry Aneurysms by Endosaccular Occlusion J. Moret, A. Boulin, and L. Castaings (With 1 Figure)	41
Strategies of Endovascular Treatment of Large and Giant Intracranial Aneurysms H.C. Nahser and D. Kühne (With 2 Figures)	45
Endovascular Treatment of Basilar Bifurcation Aneurysms M. Schumacher and W. Radü (With 4 Figures)	52
Embolization of Large Aneurysms with Detachable Balloons F. Brassel, L. Solymosi, E. Lins, J. Wappenschmidt, and W. Becker (With 2 Figures)	58

Endovascular Treatment of Internal Carotid Artery Aneurysms V. Olteanu-Nerbe, G. Dürr, A. Piepgras, P. Schmiedek, F. Marguth, and H.-J. Reulen (With 3 Figures)	63
Possibilities and Limitations of Endovascular Techniques for the Treatment of Craniocerebral Aneurysms B. Richling and G. Bavinzski (With 9 Figures)	70
Technical Possibilities and Aids in Treating Aneurysms in Open Surgery H. Meyer, G. Bertram, M. Nadji-Ohl, W. Wagner, A. Henssler, F. Schröder, and K. Pisco (With 4 Figures)	80
Surgical Procedure in Multiple Cerebral Aneurysms W. I. Steudel, R. Lorenz, D. Rosenthal, and A. Ricco	86
Circulatory Arrest and Hypothermia in the Treatment of Cerebral Aneurysms: Preliminary Results A. Brawanski, O.-W. Ullrich, U. Hartung, P. Eigel, and I. Danhauser-Leistner (With 2 Figures)	91
Principles of Aneurysm Surgery in the Acute Stage of Subarachnoid Hemorrhage K. Sano (With 1 Figure)	96
Prognosis of Aneurysmal Subarachnoid Hemorrhage: Prospective Study on 543 Patients N. Freckmann, H.-D. Herrmann, and D. Winkler	103
Early Versus Delayed Aneurysm Surgery in Subarachnoid Hemorrhage in Clinical Grade Hunt-Hess III K. Lukow, W. Köning, and J. Menzel	108
Poor-Grade Patients with Aneurysmal Subarachnoid Hemorrhage: Early or Late Operation? H. A. Trost, V. Seifert, C. Goetz, and H. Dietz	112
Timing and Grading: Problems in Poor-Grade Subarachnoid Hemorrhage R. Laumer, R. Naraghi, C. Nimsky, R. Fahlbusch, and U. Machera (With 4 Figures)	117
Early Operation in the Elderly? A. Laun, C. Eulgem, and O. Hoffmann (With 3 Figures)	123

Management Results of a Series of Predominantly Delayed Operations and Ruptured Aneurysms W. Krupp, W. Heienbrok, and R. Mücke (With 1 Figure)	129
Analysis of Relevant Intervals Between Subarachnoid Hemorrhage and Surgery on Patients with Aneurysm and Its Influence on the Decision for Early or Delayed Surgery W. Pinz, J. Meissner, G. Bertram, J. Janus, P. Assimakopoulos, M. Puschfurosh-Tehrani, and K. Pischol (With 3 Figures)	134
Significance of the History for the Planning of Therapy After Subarachnoid Hemorrhage C. Woertgen, M. Schirmer, and M. Bettag	138
Microsurgical Strategy and Surgical Results in Carotid Ophthalmic Artery Aneurysms A. G. Harders, J. M. Gilsbach, and G. Laborde (With 1 Figure) ..	140
Surgery in Cases of Subarachnoid Hemorrhage Without Definite Angiographic Evidence of Vascular Malformation A. Perneczky, J. C. Mäurer, and W. Müller-Forell	146
Differential Diagnostic Problems and Treatment of Thrombosed Giant Intracranial Aneurysms C. B. Lumenta, J. Kiwit, and M. Sabel (With 3 Figures)	150
Cerebral Artery Aneurysm in Childhood: Surgical Indications and Results S. Vogel, R. Saballus, and A. Heinitz (With 4 Figures)	156
Multiple Intracranial Aneurysms: Considerations in Planning Surgical Management M. Fylaktakis, P. Sakellariou, K. Polyzoidis, N. Baskinis, and J. Magras (With 3 Figures)	162
Psychological Stress During Operations of Aneurysms: A Factor in the Surgical Treatment of Aneurysms. Cardiac Output and Blood Pressure of the Surgeon B. Panning, M. R. Gaab, and H. Dietz (With 3 Figures)	167

Multimodal Monitoring of Evoked Potentials in Subarachnoid Hemorrhage Following a Ruptured Aneurysm P. Christophis, K. Roosen, A. Hüfner, and J. Dings (With 2 Figures)	171
Necessity of Control Angiography After Aneurysm Surgery J. Schmitt and A. Spring (With 1 Figure)	179
Magnetic Resonance Angiography of Cerebral Artery Aneurysms: Present Capabilities and Limitations B. Ostertun, L. Solymosi, H. Wassmann, and M. Reiser (With 4 Figures)	185
Differential Disturbances of Memory and Mood Following Striatum and Basal Forebrain Lesions in Patients with Ruptures of the Anterior Communicating Artery E. Irle, B. Wowra, J. Kunert, M. Peper, J. Hampl, and S. Kunze (With 4 Figures)	191
Treatment of Cerebral Vasospasm with Hypervolemia and Hypertension A. Unterberg, J. Gethmann, A. von Helden, G.-H. Schneider, and W. Lanksch (With 1 Figure)	198
Value of Transcranial Doppler Sonography in Patients Treated with Nimodipine R. Laumer, R. Steinmeier, F. Gönner, and T. Vogtmann (With 4 Figures)	202
Correlation Between Cerebral Blood Flow Velocity in Basal Cerebral Arteries and Nimodipine Concentration in Serum and Plasma After Acute Subarachnoid Hemorrhage D. Rosenthal, M. Carvi y Nievas, W.I. Steudel, A. Ricco, and R. Lorenz (With 2 Figures)	208
Laser Irradiation of Experimental Carotid Aneurysms: Long-term Results and Histological Alterations F. Ulrich, S. Dohle, and R. Schober (With 2 Figures)	214
Effects of Intrathecal Thrombolysis on CSF Absorption After Experimental Subarachnoid Hemorrhage T. Brinker, V. Seifer, and H. Dietz (With 2 Figures)	218

Malignant Gliomas

The Neurosurgical Treatment of Malignant Gliomas W. Seeger (With 21 Figures)	225
Stereotactic Interstitial Brachycurietherapy (Iridium-192 and Iodine-125) in Nonresectable Low-Grade Gliomas F. Munding	236
Perspectives of Glioma Treatment with Boron Neutron Capture Therapy in Europe D. Gabel (With 1 Figure)	242
Clinical Investigations in Boron Neutron Capture Therapy (BNCT): Pharmacokinetic, Biodistribution, and Toxicity of $\text{Na}_2\text{B}_{12}\text{H}_{11}\text{SH}$ (BSH) in Patients with Malignant Glioma D. Haritz, D. Gabel, H. Klein, and K. Pisco (With 2 Figures)	247
Laser-Induced Interstitial Thermoetherapy of Malignant Gliomas M. Bettag, F. Ulrich, R. Schober, M. Sabel, T. Kahn, S. Hessel, and W.J. Bock (With 4 Figures)	253
Interstitial Laser-Assisted Thermal Therapy of Central Brain Tumors: Preliminary Report P. W. Ascher, O. Schröttner, F. Ebner, and R. Kleinert (With 3 Figures)	258
Transforming Growth Factors- β in Malignant Glioma: Preliminary Studies on Inhibition by Antisense Oligodeoxynucleotides J. A. Koeppen, L. Owen-Schaub, E. A. Grimm, and R. P. Moser (With 4 Figures)	262
Local Adjuvant Adoptive Immunotherapy of Patients with Malignant Gliomas F. Weber, A. Klein-Struckmeyer, J. Menzel, and U. Pohl	267
Intratumoral Administration of Interferon- α in Malignant Gliomas B. Klun, B. Jereb, J. Petrič, I. Tekavčič, and A. Popadić (With 4 Figures)	270

A Preliminary Study of Superselective Intra-Arterial Cisplatin Infusion in the Treatment of Recurrent Malignant Gliomas L. Cristante, G. Siepmann, M. Westphal, and H.-D. Hermann (With 2 Figures)	276
MTT Assay for In Vitro Chemosensitivity Testing of Malignant Intracranial Tumors J.-C. Tonn, G. Nikkhah, K. Roosen, and W. Schachenmayr (With 3 Figures)	281
Radical Resection of Midline Gliomas in Children A. Sepehrnia, M. Tatagiba, and M. Samii (With 2 Figures)	286
Glioma Surgery Within a General Concept: Ultrasonic Aspiration, Laser Coagulation, Radiotherapy, Relapse Operation, Hyperthermia J. Schöche	292
Local Administration of Chemo- and Radiopharmaceuticals H. W. Pannek, F. Oppel, and R. Schnabel	295
Combined Radiotherapy of High-Grade Gliomas with Stereotactic Implanted Iodine-125 Seeds and Fractionated Low-Dose Rate Beam Irradiation: Preliminary Results J. Voges, H. Treuer, W.J. Schlegel, O. Pastyr, and V. Sturm (With 3 Figures)	298
Malignant Glioma of the Brain: Not in Every Case a Poor Prognosis? S. Victor and G. Lausberg (With 2 Figures)	304
Microsurgery of Malignant Gliomas of the Temporal Lobes: Cognitive Deficits Depend on the Extent of Lost Tissue M. Peper, B. Wowra, E. Irle, and S. Kunze (With 2 Figures)	310
Multiple Primary and Multiple Recurrent Gliomas G. Hildebrandt, I. Reuter, J.C. Tonn, and K. Roosen (With 1 Figure)	316
Relationship Between the Recurrence of Intracranial Ependymomas and the Grade of Malignancy R.-I. Ernestus, R. Schröder, and N. Klug (With 1 Figure)	321

Prognostic and Biological Significance of Gross Residual Tumor Following Extirpation of High-Grade Gliomas: Clinical Study Based on Early Postoperative MR Imaging F. K. Albert, M. Forsting, G. Schackert, J. Hamer, J. Hampl, H. H. Steiner, B. Wowra, K. Sartor, and S. Kunze (With 2 Figures)	327
Malignancy-Dependent Formation of Cysteinyl-Leukotrienes in Human Brain Tumor Tissues and Its Detection in Urine M. Winking, G. Lausberg, and T. Simmet.....	334
Immunohistochemical Expression of Epidermal Growth Factor Receptor in Human Gliomas J. Behnke, J. Bayer, H. Ludwig, and B. Rama.....	336
 Winning Poster and Lecture Presentations	
Pituitary Microcirculation Measured by Laser Doppler Flowmetry: Physiological and Clinical Aspects R. Steinmeier, A. Dötterl, and R. Fahlbusch (With 4 Figures)	341
Can Motor Evoked Potentials Contribute to the Indication for Surgery in Cervical Spondylotic Disease? B. Meyer, J. Zentner, and C. Ozdoba (With 3 Figures)	350
Is the Hunt and Hess Scale Outdated? A. Aschoff, J. Hampl, E. Hund, J. Raety, W. Hacke, and S. Kunze	357
Monocyte Killing of Malignant Brain Tumor Cells M. Kirsch and G. Schackert (With 3 Figures)	363
Temporary Middle Cerebral Artery Clipping: Pathophysiological Investigation on the Effect of Mannitol and Nimodipine: A Model for Aneurysm Surgery E. Rickels, M. R. Gaab, and H. E. Heissler (With 4 Figures)	371
Experimental Peripheral Nerve Regeneration: Interposition of Placenta-Amnion Membrane and Umbilical Cord Versus Autologous Transplantation H. Müller, T. Dombert, and H. Arnold (With 4 Figures)	376

Growth Characteristics and Proliferation Parameters of Invasive Pituitary Adenomas M. Buchfelder, R. Fahlbusch, E. F. Adams, M. Roth, and P. Thierauf (With 4 Figures)	381
Intraoperative Antibiotic Prophylaxis in Neurosurgery: A Prospective Randomized Trial in 840 Patients J. Zentner, J. Gilsbach, and T. Gaillard	387
Subject Index	393

List of Contributors

- Adams, E.F. 381
Albert, F.K. 327
Arnold, H. 376
Ascher, P.W. 258
Aschoff, A. 357
Assimakopoulos, P. 134
Baskinis, N. 162
Bavinzski, G. 70
Bayer, J. 336
Becker, W. 58
Behnke, J. 336
Bertram, G. 80, 134
Bettag, M. 138, 253
Bock, W.J. 23, 253
Boulin, A. 41
Brassel, F. 58
Brawanski, A. 91
Brinker, T. 218
Buchfelder, M. 381
Bushe, K.-A. 3
Carvi y Nievas, M. 208
Castaings, L. 41
Christophis, P. 171
Cristante, L. 276
Danhauser-Leistner, I. 91
Dietz, H. 112, 167, 218
Dings, J. 171
Dohle, S. 214
Dombert, T. 376
Dötterl, A. 341
Dürr, G. 63
Ebner, F. 258
Eigel, P. 91
Ernestus, R.-I. 321
Eulgem, C. 123
Fahlbusch, R. 117, 341, 381
Forsting, M. 327
Freckmann, N. 103
Fylaktakis, M. 162
Gaab, M.R. 167, 371
Gabel, D. 242, 247
Gaillard, T. 387
Gethmann, J. 198
Gilsbach, J.M. 140, 387
Goetz, Ch. 112
Gönner, F. 202
Grimm, E.A. 262
Hacke, W. 357
Hamer, J. 327
Hampl, J. 191, 327, 357
Harders, A.G. 140
Haritz, D. 247
Hartung, U. 91
Heienbrok, W. 129
Heinitz, A. 156
Heissler, H.E. 371
Henssler, A. 80
Herrmann, H.-D. 103, 276
Hessel, S. 253
Hildebrandt, G. 316
Hoffmann, O. 123
Hüfner, A. 171
Hund, E. 357
Irl, E. 191, 310
Janus, J. 134
Jereb, B. 270
Kahn, T. 253
Kirsch, M. 363
Kiwit, J. 150
Klein, H. 247

- Klein-Struckmeyer, A. 267
Kleinert, R. 258
Klug, N. 321
Klun, B. 270
Koeppen, J. A. 262
Köning, W. 108
Krupp, W. 129
Kühne, D. 45
Kunze, S. 191, 310, 327, 357
Laborde, G. 140
Lanksch, W. 198
Laumer, R. 117, 202
Laun, A. 123
Lausberg, G. 304, 334
Lins, E. 58
Lorenz, R. 86, 208
Ludwig, H. 336
Lukow, K. 108
Lumenta, C.B. 150
Machera, U. 117
Magras, J. 162
Marguth, F. 63
Mäurer, J.C. 146
Meissner, J. 134
Menzel, J. 108, 267
Meyer, B. 350
Meyer, H. 80
Moret, J. 41
Moser, R.P. 262
Müke, R. 129
Müller, H. 376
Müller-Forell, W. 146
Mundinger, F. 236
Nadji-Ohl, M. 80
Nahser, H.C. 45
Naraghi, R. 117
Nikkhah, G. 281
Nimsky, C. 117
Olteanu-Nerbe, V. 63
Oppel, F. 295
Ostertun, B. 185
Owen-Schaub, L. 262
Ozdoba, C. 350
Pannek, H. W. 295
Panning, B. 167
Pastyr, O. 298
Peper, M. 191, 310
Perneczky, A. 146
Petrič, J. 270
Piepgras, A. 63
Pinz, W. 134
Piscol, K. 1, 80, 134, 247
Pohl, U. 267
Polyzoidis, K. 162
Popadič, A. 270
Pusfurosh-Tehrani, M. 134
Radü, W. 52
Raety, J. 357
Rama, B. 336
Reiser, M. 185
Reulen, H.-J. 63
Reuter, I. 316
Ricco, A. 86, 208
Richling, B. 70
Rickels, E. 371
Roosen, K. 171, 281
Rosenthal, D. 86, 208
Roth, M. 381
Saballus, R. 156
Sabel, M. 150, 253
Sakellariou, P. 162
Samii, M. 286
Sano, K. 96
Sartor, K. 327
Schachenmayr, W. 281
Schackert, G. 327, 363
Schirmer, M. 138
Schlegel, W.J. 298
Schiedek, P. 63
Schmitt, J. 179
Schnabel, R. 295
Schneider, G.-H. 198
Schober, R. 214, 253
Schöche, J. 292
Schreiber, H.L. 34
Schröder, F. 80
Schröder, R. 321
Schröttner, O. 258
Schumacher, M. 52
Seeger, W. 225

- Seifert, V. 112, 218
Sepehrnia, A. 286
Siepmann, G. 276
Simmet, T. 334
Solymosi, L. 58, 185
Spring, A. 179
Steiner, H. H. 327
Steinmeier, R. 202, 341
Steudel, W. I. 86, 208
Sturm, V. 298
Tatagiba, M. 286
Tekavičič, I. 270
Thierauf, P. 381
Tonn, J.-C. 281
Treuer, H. 298
Trost, H. A. 112
Ullrich, O.-W. 91
Ulrich, F. 214, 253
Unterberg, A. 198
Victor, S. 304
Vogel, S. 156
Voges, J. 298
Vogtmann, T. 202
von Helden, A. 198
Wagner, W. 80
Wappenschmidt, J. 58
Wassmann, H. 185
Weber, F. 267
Westphal, M. 276
Winking, M. 334
Winkler, D. 103
Woertgen, C. 138
Wowra, B. 191, 310, 327
Wüllenweber, R. 29
Zentner, J. 350, 387



First Sculpture of a Neurosurgeon working with Microscope, created by the famous sculptor Prof. Bernd Altenstein, Academy of Arts Bremen, on the occasion of the 42nd Annual meeting of the German Society for Neurosurgery, Bremen: 5–8 May 1991. Bronze; 34.0 × 30.5 × 8.5 cm. Edition: 1–8 with number and signature (Information: Congress President)