

SUPPLEMENT TO  
NEUROSURGERY

# CLINICAL NEUROSURGERY

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VOLUME 58



*Education and Innovation*

# CLINICAL NEUROSURGERY



*Education and Innovation*



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## Preface

The 60<sup>th</sup> Annual Meeting of the Congress of Neurological Surgeons was held in San Francisco, California, from October 16-21, 2010. Volume 58 of *Clinical Neurosurgery* represents the official compilation of the invited scientific manuscripts from the plenary sessions, The Presidential Address by Dr Gerald E. Rodts, Jr, and biographic and bibliographic information of the Honored Guest, Dr Daniel L. Barrow.

Dr Ali Rezai, Annual Meeting Chairman, and Drs Russell Lonser and Ganesh Rao, Scientific Program Chair and Vice-Chair, respectively, organized a truly outstanding meeting. The theme of this year's Annual Meeting was *A Celebration of Neurosurgery*. The CNS was also honored and delighted to partner with the Korean Neurosurgical Society for this meeting.

Dr Rodts delivered his Presidential address on the history of spinal surgery from ancient Egypt and Greece to the modern era. He highlighted the urgent need to improve the medical evidence for our treatments and current challenges in our ability to deliver care to our patients with spinal disorders. His address ended with the words of his grandfather: "never forget that it is a great privilege" to be a neurosurgeon.

Honored Guest and CNS Past President, Dr Daniel Barrow, Professor and Chairman of Neurosurgery at Emory University, gave three scholarly addresses discussing the evolution of the management of cavernous malformations, complication avoidance in the surgical management of cerebral aneurysms, and the many differences of his own practice from that of his father's as a general practitioner in a different era.

I have really enjoyed serving as Editor of *Clinical Neurosurgery*. I would like to thank my co-editors, Dr Robert Mericle and Dr Todd Hankinson, for volunteering their time and dedication to the peer review. I would like to extend a special thank you to Michele Lengerman and Laurie Behncke from the CNS Headquarters Office for their unparalleled dedication and hard work throughout the year on *Clinical Neurosurgery* and the Congress of Neurological Surgeons.

We welcome Dr Christopher C. Getch as the new President of the Congress of Neurological Surgeons and look forward to seeing you all in Washington, DC in October.

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DANIEL L. BARROW

**Honored Guest**  
**Daniel L. Barrow, MD**  
**MBNA/Bowman Professor and Chairman**  
**Department of Neurological Surgery**  
**Director, Emory Stroke Center**  
**Chief of the Neurological Surgery Service at**  
**Emory University Hospital**

Daniel Louis Barrow graduated magna cum laude from Westminster College and received his MD degree from Southern Illinois University School of Medicine. He completed his general surgery internship and neurosurgical residency at Emory University Affiliated Hospitals and obtained his neurology training at Massachusetts General Hospital. Upon completing his neurosurgical residency, he completed a fellowship in cerebrovascular surgery at the Mayo Clinic in Rochester, Minnesota, and obtained additional training at the Barrow Neurological Institute in Phoenix, Arizona. He is the MBNA/Bowman Professor and Chairman of the Department of Neurosurgery and Director of the Emory Stroke Center at Emory University School of Medicine.

Dr Barrow has authored more than 250 scientific articles and chapters in medical textbooks. He has authored or edited 14 monographs, including a major textbook of neurosurgery, *The Practice of Neurosurgery*. He has been a visiting professor at major universities throughout North America, Europe, Africa, and Asia. His research interests have focused on cerebrovascular disease and stroke. During his career in medicine, he has won many awards, including induction into the honorary medical society, Alpha Omega Alpha. In 1997, Dr Barrow received the Distinguished Alumnus Award from Southern Illinois University School of Medicine, and in 1998, he received the Alumni Achievement Award from Westminster College. He was the 2010 Honored Guest of the Congress of Neurological Surgeons.

Dr Barrow has been active in organized neurosurgery, holding a variety of leadership and editorial positions. He was on the Executive Committee of the CNS from 1989–2001 and served as Scientific Program Committee chairman (1991), Annual Meeting Committee chairman (1992), Secretary (1992-1995), and President (1999-2000). He was President of the Georgia Neurosurgical Society and member of the AANS/CNS Washington Committee. Dr Barrow has been on the editorial boards of *Clinical Neurosurgery*, *NEUROSURGERY*, *Neurosurgical Consultations*, *Neurologia Medico Chirurgica*, *The Journal of the Korean Neurosurgical Society*; has coedited *Contemporary Neurosurgery* (1985-1995); edited *Perspectives in Neurological Surgery* (1989-1992); and chaired the AANS Publications Committee. He is a Director of the American Board of Neurological Surgery and has served as Secretary (2008-2011) and is currently chairman of the ABNS. He is past Vice President and currently Treasurer of the American Academy of Neurological Surgeons.

Dr Barrow is an avid outdoorsman who enjoys hunting, fishing, and other outdoor sporting activities. He is married to Mollie Winston Barrow, a practicing oral and maxillofacial surgeon. They live in Atlanta and have three children—Emily (age 23), Jack (age 21), and Tom (age 18).

## Selected Bibliography for Daniel L. Barrow, MD

Being selected as the Honored Guest of the Congress of Neurological Surgeons was the singular honor of my professional career and the most humbling, considering the company I have joined. If I have had any success in my career, it comes with a debt of gratitude to many. First, I am indebted to my patients who have entrusted me with their health and their lives. I am privileged to have that trust and confidence. I owe a great debt to my teachers and mentors: John Jane, George Tindall, Thoralf Sundt, David Piepgras, and Robert Spetzler. I thank my colleagues in the Department of Neurosurgery at Emory, who have been the most collegial group of professionals one could ever hope to work with. In particular, I want to recognize Rusty Rodts for his support and great work as the President of the CNS. I can never repay the debt I owe my parents, grandparents, and immediate family. My children, Emily, Jack and Tom, have provided me with the greatest rewards in my life. Most of all, I am indebted to my dearest friend and the love of my life, my wife, Mollie. She has made me a better person than I would have been had I not had the great fortune to meet her.

### JOURNAL ARTICLES

1. Barrow DL, Fleischer AS, Hoffman JC. Complications of detachable balloon catheter technique in the treatment of traumatic intracranial arteriovenous fistulas. *J Neurosurgery*. 1982;56:396-403.
2. Fleischer AS, Barrow DL. Axioms on head injury. *Hospital Medicine*. 1982;March: 66A-66X.
3. Barrow DL, Wood JH, Hoffman JC Jr. Clinical indications for computer-assisted myelography. *Neurosurgery*. 1983;12:47-57.
4. Barrow DL, Nahai F, Fleischer AS. Utilization of free latissimus dorsi musculocutaneous flaps in various neurosurgical disorders. *J Neurosurgery*. 1983;58:252-258.
5. Barrow DL, Tindall GT. The surgical management of prolactin-secreting pituitary tumors (prolactinomas). Part 1. *Contemporary Neurosurgery*. 1983;4(23).
6. Tindall GT, Barrow DL. The surgical management of prolactin-secreting pituitary tumors (prolactinomas). Part 2. *Contemporary Neurosurgery*. 1983;4(24).
7. Barrow DL, Hoffman JC Jr. Spinal cord imaging with computer-assisted myelography. Part 1. *Contemporary Neurosurgery*. 1983;5(22).
8. Barrow DL, Hoffman JC Jr. Spinal cord imaging with computer-assisted myelography. Part 2. *Contemporary Neurosurgery*. 1983;5(22).
9. Barrow DL, Tindall SC, Tindall GT. Management of pituitary adenomas. *J Med Assoc Georgia*. 1983;72:837-844.
10. Horvath E, Scheithauer BW, Kovacs K, et al. Pituitary adenomas producing growth hormone, prolactin, and one or more glycoprotein hormones. A histologic, immunocytochemical and ultrastructural study of four surgically proven tumors. *Ultrastructural Pathology*. 1983;5:171-183.
11. Barrow DL, Tindall GT. Pituitary adenomas. An update on their management with an emphasis on the role of bromocriptine. *J Clin Neuro-ophthalmol*. 1983;3:229-237.
12. Barrow DL, Tindall GT, Kovacs K, Thorner MO, Horvath E, Hoffman JC Jr. Clinical and pathological effects of bromocriptine on prolactin-secreting and other pituitary tumors. *J Neurosurgery*. 1984;60:1-7.
13. Barrow DL, Nahai F, Tindall GT. The use of greater omentum free vascularized flaps for neurosurgical wounds requiring reconstruction. *J Neurosurgery*. 1984;60:305-311.
14. Landman JA, Barrow DL, Braun IF, Hoffman JC Jr. Value of computed tomographic myelography in the recognition of cervical herniated disc. *Am J Neuroradiology*. 1984;5:391-394.
15. Asa SL, Kovacs K, Tindall GT, Barrow DL, Horvath E, Takei Y. Cushing's disease associated with a hypothalamic gangliocytoma producing corticotropin-releasing factor and

- pituitary corticotroph hyperplasia: Evidence for a hypothalamic etiology. *Ann Int Med.* 1984;101:789-793.
16. Tindall GT, Barrow DL. Prolactinomas. In: Wilkins RH, Rengachary SS (eds.). *Neurosurgery*. Vol. 2. New York, NY: McGraw-Hill, 1985:852-858.
  17. Fleischer AS, Barrow DL. Distal anterior cerebral artery aneurysms. In: Wilkins RH, Rengachary SS (eds.). *Neurosurgery*. Vol. 2. New York, NY: McGraw-Hill, 1985: 1383-1385.
  18. Barrow DL, Spector RH, Landman JH, Braun IF, Tindall SC, Tindall GT. Classification and treatment of spontaneous carotid-cavernous sinus fistulas. *J Neurosurgery*. 1985;62:248-256.
  19. Barrow DL, Tindall GT. Acromegaly. *Contemporary Neurosurgery*. 1985;7(1).
  20. Barrow DL, Spector RH, Takei Y, Tindall GT. Symptomatic Rathke's cleft cysts located entirely in the suprasellar region: Review of diagnosis, management and pathogenesis. *Neurosurgery*. 1985;16:766-772.
  21. Prats AR, Barrow DL, Tindall GT. Craniopharyngiomas-Part 1. *Contemporary Neurosurgery*. 1985;7(14).
  22. Prats AR, Barrow DL, Tindall GT. Craniopharyngiomas-Part 2. *Contemporary Neurosurgery*. 1985;7(15).
  23. Bakay RAE, Fiandaca MS, Barrow DL, Schiff A, Collins DC. Preliminary report on the use of fetal tissue transplantation to correct MPTP Parkinson-like syndrome in primates. Proc. 9th Meeting World Soc. Stereotactic and Functional Neurosurgery, Toronto 1985. *Appl Neurophysiol*. 1985;48:358-361.
  24. Hadley MN, Barrow DL, Spetzler RF, Martin NA. Management of extracranial carotid artery disease. Part 1. Asymptomatic carotid atherosclerosis. *BNI Quarterly*. 1987;3(2): 17-26.
  25. Colbassani HJ, Barrow DL. Fluid and electrolyte disorders. *Contemporary Neurosurgery*. 1987;9(10).
  26. Prats AR, Barrow DL. Preoperative management of the aneurysmal subarachnoid hemorrhage patient. Part 1. *Contemporary Neurosurgery*. 1987;9(12).
  27. Barrow DL, Prats AR. Preoperative management of the aneurysmal subarachnoid hemorrhage patient. Part 2. *Contemporary Neurosurgery*. 1987;9(13).
  28. Nishio S, Mizuno J, Barrow DL, Takei Y, Tindall GT. Pituitary tumors composed of adenohypophyseal adenoma and Rathke's cleft cyst elements: A clinicopathological study. *Neurosurgery*. 1987;21:371-377.
  29. Mizuno J, Nishio S, Barrow DL, Tindall GT, Takei Y. Ganglioglioma of cerebellum. Case report. *Neurosurgery*. 1987;21:718-721.
  30. Nishio J, Mizuno J, Barrow DL, Takei Y, Tindall GT. Isolated histiocytosis X of the pituitary gland. Case report. *Neurosurgery*. 1987;21:584-588.
  31. Barrow DL, Mizuno J, Tindall GT. Management of prolactinomas associated with very high serum prolactin levels. *J Neurosurgery*. 1988;68:554-558.
  32. Tindall GT, Barrow DL, Tindall SC. Current management of pituitary tumors. Part 1. *Contemporary Neurosurgery*. 1988;10(2).
  33. Tindall GT, Barrow DL, Tindall SC. Current management of pituitary tumors. Part 2. *Contemporary Neurosurgery*. 1988;10(2).
  34. Nishio S, Mizuno J, Barrow DL, Takei Y, O'Brien MS. Intracranial extradural glioneuronal heterotopia. Case report. *Child's Nerv Syst*. 1988;4:244-248.
  35. Barrow DL, Fiandaca MS. Carotid-cavernous sinus fistulas: Anatomical considerations, diagnosis and management. Part 1. *Contemporary Neurosurgery*. 1988; 10(11).
  36. Barrow DL. Carotid-cavernous sinus fistulas: Anatomical considerations, diagnosis and management. Part 2. *Contemporary Neurosurgery*. 1988;10(12).
  37. Barrow DL. Unruptured cerebral arteriovenous malformations presenting with intracranial hypertension. *Neurosurgery*. 1988;23:484-490.

38. Castillo M, Silverstein A, Hoffman JC Jr, Barrow DL. Spontaneous thrombosis of a direct carotid cavernous fistula. Angiographic appearance and confirmation by gadolinium enhanced MR. *Am J Neuroradiol.* 1989;10:S75-S76.
39. Tindall GT, Barrow DL, Tindall SC. Current management of pituitary tumors. *Emory J Med.* 1989;3:197-206.
40. Colbassani H, Barrow DL, Sweeney KM, Bakay RAE, Check IJ, Hunter RL. Modification of acute focal ischemia by poloxamer 188. *Stroke.* 1989;20:1241-1246.
41. Peterman SB, Hoffman JC Jr, Barrow DL. Interventional neuroradiology. *Emory J Med.* 1990;4(4):263-275.
42. Barrow DL, Bakay RAE, Crocker I, McGinley P, Tindall GT. Stereotactic radiosurgery. *J Med Assoc Georgia.* 1990;79:667-676.
43. Barrow DL, Prats AR. Infectious intracranial aneurysms: Comparison of groups with and without endocarditis. *Neurosurgery.* 1990;27:562-573.
44. Barrow DL, Tindall GT. Visual loss following transsphenoidal surgery. *Neurosurgery.* 1990;27:60-68.
45. Barrow DL. Cerebral AVM's. *Neurosurgical Consultations.* 1990;I(4).
46. Oyesiku NM, Barrow DL, Eckman JR, Tindall SC, Colohan ART. Intracranial aneurysms in sickle cell anemia: Clinical features and pathogenesis. *J Neurosurgery.* 1991;75:356-363.
47. Ortiz JR, Newman NJ, Barrow DL. CREST-associated multiple intracranial aneurysms and bilateral optic neuropathies. *J Clin Neuroophthalmology.* 1991;11(4):233-240.
48. Reisner A, Barrow DL. Neurosurgical Aspects of Fibromuscular Dysplasia. *Perspectives in Neurological Surgery.* 1991;2(2):27-54.
49. Barrow DL. Intraoperative angiography. *Neuroscience Forum.* 1992;2(1):10-14.
50. Barrow DL, Boyer KL, Joseph GJ. Intraoperative angiography in the management of neurovascular disorders. *Neurosurgery.* 1992;30:153-159.
51. Heller JG, Levy M, Barrow DL. Odontoid fracture malunion with fixed atlanto-axial subluxation. *Spine.* 1993;18:311-314.
52. Barrow DL, Tindall GT, Tindall SC. Combined transsphenoidal transcranial operative approach to selected sellar tumors. *Perspectives in Neurological Surgery.* 1993;3(2):47-57.
53. Oyesiku NM, Colohan ART, Barrow DL, Reisner A. Cocaine-induced aneurysmal rupture: An emergent factor in the natural history of intracranial aneurysms. *Neurosurgery.* 1993;32:518-526.
54. Barrow DL, Reisner A. Natural History of Intracranial Aneurysms and Vascular Malformations. *Clinical Neurosurgery.* 1993;40:3-39.
55. Morón MA, Barrow DL. CSF galactorrhea after ventriculoperitoneal shunting: Case report. *Surgical Neurology.* 1994;41:1-7.
56. Krisht A, Barnett DW, Barrow DL, Bonner G. The blood supply of the intracavernous cranial nerves: An anatomic study. *Neurosurgery.* 1994;34:275-279.
57. Barnett DW, Barrow DL, Joseph GJ. Combined extracranial-intracranial bypass and balloon occlusion for the treatment of intracavernous and proximal carotid artery aneurysms. Technical report. *Neurosurgery.* 1994;35:92-98.
58. Barrow DL, Colohan ART, Dawson R. Intradural perimedullary arteriovenous fistulas (Type IV spinal cord arteriovenous malformations). *J Neurosurgery.* 1994;81:221-229.
59. Alleyne CH, Barrow DL. Immune response in hosts with cadaveric dural grafts. Report of two cases. *J Neurosurgery.* 1994;81:610-613.
60. Krisht A, Barrow DL, Barnett DW, Bonner GD, Shengelaia G. The microsurgical anatomy of the superior hypophyseal artery. *Neurosurgery.* 1994;35:899-903.
61. Barrow DL, Dawson R. Surgical management of arteriovenous malformations in the region of the ventricular trigone. *Neurosurgery.* 1994;35:1046-1054.
62. Barrow DL, Alleyne CH. What's New in Neurosurgery. *Bulletin of the American College of Surgeons.* 1995;80(1):35-38, 111.

63. Dawson RC, Krisht AF, Barrow DL, Joseph GJ, Shengelaia GG, Bonner G. Permanent therapy of experimental aneurysms using collagen-coated microcoils. *Neurosurgery*. 1995;36:133-140.
64. Cawley CM, Barrow DL, Newman NJ. The surgical management of orbital tumors. *Contemporary Neurosurgery*. 1995;17(5).
65. Batjer HH, Barrow DL, Dacey RG Jr, Hopkins LN, Stieg PE. Expert exchange: Surgical approaches and specific technical problems in aneurysm surgery. *Perspectives in Neurological Surgery*. 1995;6(1):61-68.
66. Barrow DL, Alleyne CH. Natural history of giant intracranial aneurysms and indications for intervention. *Clinical Neurosurgery*. 1995;42:214-244.
67. Friedlander LD, Barrow DL, Bakay RAE. Microsurgical revascularization of the ophthalmic artery. *Skull Base Surgery*. 1995;5:191-198.
68. Cawley CM, Barrow DL. Cavernous sinus dural arteriovenous malformations. In: Awad IA (ed.). *Techniques in Neurosurgery*. Vol. 2, No 1. New York, Raven Press, 1997;2(1):41-52.
69. Krisht AF, Barrow DL, Al-Mefty O, Dawson RC, Shengelaia G, Bonner G. Venous anatomy of the vein of labbe complex. In: Hakuba A (ed.). *Surgery of the Intracranial Venous System*. Tokyo, Japan: Springer-Verlag, 1996.
70. Cawley CM, Dawson RC, Shengelaia G, Barrow DL, Colohan ART. A true arterial saccular aneurysm model in the rabbit. *American Journal of Neuroradiology*. 1996;17:1761-1766.
71. Oyesiku NM, Barrow DL. Distal anterior cerebral artery aneurysms. In: Wilkins RH, Rengachary SS (eds.). *Neurosurgery*. 2nd Edition. New York, NY: McGraw-Hill, 1996:2327-2331.
72. Dodson TB, Bays RA, Pfeffe RC, Barrow DL. Cranial bone grafts to reconstruct the mandibular condyle in Macaca mulatta. *Journal of Oral Maxillofacial Surgery*. 1997;55:260-267.
73. Alleyne CH Jr, Joseph GJ, Dawson RC, Barrow DL. Unusual intracranial transverse-sigmoid arteriovenous fistula mimicking a carotid-cavernous fistula. *Journal of Neurovascular Disease*. 1997;2:145-148.
74. Alleyne CH Jr, Barrow DL. Surgical anatomy of the middle meningeal artery. *Journal of Neurovascular Disease*. 1997;2:193-198.
75. Barrow DL. Classification and natural history of cerebral vascular malformations: Arteriovenous, cavernous and venous. *Journal of Stroke and Cerebrovascular Diseases*. 1997;6:264-267.
76. Alleyne CH Jr, Hunter S, Olson JJ, Barrow DL. Lipomatous glioneurocytoma of the posterior fossa with divergent differentiation: Case report. *Neurosurgery*. 1998;42: 639-643.
77. Alleyne CH Jr, Cawley CM, Barrow DL, Poff B, Sawhney A, Dillehay DL. Efficacy and biocompatibility of a photopolymerized, synthetic, absorbable hydrogel as a dural sealant in a canine craniotomy model. *Journal of Neurosurgery*. 1998;88:308-313.
78. Barrow DL. Avoidance of complications in the surgical resection of arteriovenous malformations of the brain. *Japanese Journal of Neurosurgery*. 1998;7:141-149.
79. Barrow DL. Ten most commonly asked questions about dural arteriovenous malformations. *The Neurologist*. 1998;4:105-110.
80. Alleyne CH Jr, Cawley CM, Shengelaia GG, Barrow DL. Microsurgical anatomy of the artery of Adamkiewicz. *Journal of Neurosurgery*. 1998;89:791-795.
81. Alleyne CH Jr, Cawley CM, Barrow DL, Bonner GD. Microsurgical anatomy of the dorsal cervical nerve roots and the cervical dorsal root ganglion/ventral root complexes. *Surgical Neurology*. 1998;50:213-218.
82. Dawson RC III, Joseph GJ, Owens DS, Barrow DL. Transvenous embolization as the primary therapy for arteriovenous fistulas of the lateral and sigmoid sinuses. *AJNR*. 1998;19:571-576.

83. Friedlander LW, Barrow DL, Crenshaw SM, Haygood WF, Wood JH. Binocular fundus reflectometry as an indicator of ocular perfusion. System design and experimental results. *Journal of Neurovascular Disease, Prime National Publishing.* 1998;3(2):81-87.
84. Barrow DL. Controversies in neurosurgery. Microsurgery versus radiosurgery for arteriovenous malformations: The case for microsurgery. *Clinical Neurosurgery.* 1999;45: 13-17.
85. Alleyne CH Jr, Barrow DL, Joseph G. Surgical management of angiographically occult spinal dural arteriovenous fistulae (Type I spinal arteriovenous malformations): Three technical case reports. *Neurosurgery.* 1999;44:891-895.
86. Abruzzo T, Joseph GJ, Owens DS, Dawson RC, Reid J, Barrow DL. Prevention of complications resulting from endovascular carotid sacrifice: A retrospective assessment. *Neurosurgery.* 2000;46:910-917.
87. Barrow DL, Cawley CM. Therapeutic carotid occlusion: Indications and potential complications. *Clinical Neurosurgery.* 2000;46:392-409.
88. Barrow DL. Controversies in neurosurgery: Microsurgery versus radiosurgery for arteriovenous malformations-The case for microsurgery. *Clinical Neurosurgery.* 2000;46: 285-294.
89. Barrow DL, Cawley CM. Extended skull base approaches for intracranial aneurysms. *Clinical Neurosurgery.* 2000;47:139-177.
90. Barrow DL, Hadley MN. Fifty years of the Congress of Neurological Surgeons: Foundations, objectives and legacies. *Neurosurgery.* 2000;47:261-267.
91. Zhang YJ, Barrow DL, Day AL. Extracranial-intracranial vein graft bypass for giant intracranial aneurysm surgery in pediatric patients. Two technical case reports. *Neurosurgery.* 2002;50:663-668.
92. Barrow DL. Reaching for Utopia and slouching towards Gomorrah. Presidential Address of the 50<sup>th</sup> Annual Meeting of the Congress of Neurological Surgeons. *Neurosurgery.* 2002; 50:1181-1189.
93. Tang G, Cawley CM, Dion JE, Barrow DL. Intraoperative angiography for aneurysm surgery: A prospective evaluation of efficacy. *Journal of Neurosurgery.* 2002;96:993-999.
94. Narayan P, Samuels OB, Barrow DL. Stroke and pediatric human immunodeficiency virus infection: Case report and review of literature. *Pediatric Neurosurgery.* 2002;37:158-163.
95. Cloft HJ, Tong FC, Joseph GJ, Dion JE, Barrow DL. Early Intracerebral hemorrhage complicating the successful occlusion of a carotid-cavernous fistula. *Interventional Neuroradiology.* 2002;8:209-212.
96. Barrow DL. Reaching for Utopia and slouching towards Gomorrah. 2000 Congress of Neurological Surgeons Presidential Address. *Clinical Neurosurgery.* 2002;49:562-579.
97. Johnston SC, Higashida RT, Barrow DL, et al. Recommendations for endovascular treatment of intracranial aneurysms. A statement for healthcare professionals from the committee on Cerebrovascular Imaging of the American Heart Association Council on Cardiovascular Radiology. *Stroke.* 2002;33:2536-2544.
98. Barnes B, Cawley CM, Barrow DL. Intracerebral hemorrhage secondary to vascular lesions, in spontaneous intracranial hemorrhage. Rasmussen PA (ed). *Neurosurgery Clinics of North America.* 13(3):289-297, 2002, Jul.
99. Alleyne CH Jr, Barrow DL, Oyesiku NM. Combined transsphenoidal and pterional craniotomy approach to giant pituitary tumors. *Surgical Neurology.* 2002;57:380-390.
100. Narayan P, Barrow DL. Intramedullary spinal cavernous malformation following spinal irradiation. Case report and review of the literature. *Journal of Neurosurgery (Spine).* 2003;98:68-72.
101. Zhang J, Barrow DL, Cawley CM, Dion JE. Neurosurgical management of intracranial aneurysms previously treated with endovascular therapy. *Neurosurgery.* 2003;52:283-294.
102. Tomak PR, Cloft HJ, Kaga A, Cawley CM, Dion J, Barrow DL. Evolution of the management of tentorial dural arteriovenous malformations. *Neurosurgery.* 2003;52: 750-762.

103. Narayan P, Workman M, Barrow DL. Surgical treatment of lenticulostriate aneurysm. Case report. *J Neurosurgery*. 2004;100:340-342.
104. Barrow D. Bad science ISAT: The impact on neurosurgical practice. *Clinical Neurosurgery*. 2004;51:126-131.
105. Barrow DL, Cawley CM. Surgical management of complex intracranial aneurysms. *Neurology India*. 2004;52(2):156-162.
106. Scarbrough TJ, Crocker IR, Ting JY, Davis LW, Barrow DL, Oyesiku NM. Intracranial arteriovenous malformations (AVMs) treated utilizing a linear accelerator-base patient rotator or commercially available radiosurgery system. *Stereotactic and Functional Neurosurgery*. 2005;83:91-100.
107. Dhall SS, Tumialán LM, Brat D, Barrow DL. Spinal intradural clear cell meningioma after resection of a suprasellar clear cell meningioma: Case report and recommendations for management. *J Neurosurg*. 2005;103(3):559-563.
108. Tumialán LM, Cawley CM, Barrow DL. Arachnoid cyst with associated arachnoiditis developing after subarachnoid hemorrhage. *J Neurosurg*. 2005;103:1088-1091.
109. Tumialán LM, Dhall SS, Tomak PR, Barrow DL. Alagille syndrome and aneurysmal subarachnoid hemorrhage. *Pediatric Neurosurgery*. 2006;42(1):57-61.
110. Mizuno J, Mummaneni PV, Rodts GE, Barrow DL. Recurrent subdural hematoma caused by cerebrospinal fluid leakage. Case report. *J Neurosurg (Spine)*. 2006;4:183-185.
111. Tumialán LM, Brat DJ, Fountain AJ, Barrow DL. Astroblastoma mimicking a cavernous malformation: Case report. *Neurosurgery*. 2007;60:569-570.
112. Tumialán LM, Lin MJ, Fountain J, Barrow DL. CT venography used for preoperative planning of foreign body extraction in penetrating craniocerebral trauma: Technical case report. *J Trauma*. 2009 Feb, 66(2):567-569.
113. Tumialán LM, Zhang J, Cawley CM, Dion JE, Tong FC, Barrow DL. Intracranial hemorrhage associated with stent-assisted coil embolization of cerebral aneurysms: a cautionary report. *J Neurosurg*. 2008;108:1122-1129.
114. Tumialán LM, Barrow DL, Tindall SC. The history of neurosurgery at Emory University in Atlanta, Georgia. *Neurosurgery*. 2008;62:1361-1369.
115. Elliott-Lewis EW, Mason AM, Barrow DL. Evaluation of a new bipolar coagulation forceps in a thermal damage assessment. *Neurosurgery*. 2009;65:1182-1187.
116. Mason AM, Cawley CM, Barrow DL. Surgical management of intracranial aneurysms in the endovascular era: review article. *J Korean Neurosurg Soc*. 2009;45:133-142.
117. Schuette AJ, Cawley CM, Barrow DL. The current role of microsurgical clip ligation for intracranial aneurysms. *Contemporary Neurosurgery*. 2009;31(17):1-8.
118. Menon VM, LaBorde DV, Brat DJ, Barrow DL. Primary intracranial fibrosarcoma in a patient with a remote history of chest wall liposarcoma: case report and review of the literature. *Int J Neurol Neurosurg*. 2009;1(4):197-205.
119. Hadjipanayis CG, Schuette AJ, Boulis N, Hao C, Barrow DL, Teo C. Full scope of options. *Neurosurgery*. 2010;67(1):197-204.
120. Giannotta SL, Barrow DL. Cavernous malformations introduction. *Neurosurgical Focus*. 2010;29:3.
121. Schuette AJ, Cawley CM, Barrow DL. Indocyanine green videoangiography in the management of dural arteriovenous fistulae. *Neurosurgery*. 2010;67:3, 658-662.
122. Barrow DL, Spetzler RF. Cotton-clipping technique to repair intraoperative aneurysm neck tear: A technical note. *Neurosurgery*. 68:ons294-299, 2010.
123. Samuels O, Webb A, Culler S, Martin K, Barrow DL. Impact of a dedicated neurocritical care team in treating patients with aneurysmal subarachnoid hemorrhage in a neuroscience intensive care unit. *Neurocritical Care*. 2011;3:334-340.

ACCEPTED FOR PUBLICATION

1. LaBorde DV, Mason AM, Riley J, Dion JE, Barrow DL. Aneurysm of a duplicate middle cerebral artery: case report and review of the literature. *World Neurosurg*.

2. Selden NR, Origitano TC, Burchiel KJ, et al. A systematic, national fundamentals curriculum of incoming neurosurgery PGY1 residents: The 2010 Society of Neurological Surgeons Bootcamp Courses. *Neurosurgery*.
3. Hui FK, Schuette AJ, Moskowitz SI, et al. Microsurgical and endovascular management of pericallosal aneurysms. *J Neurointerventional Surg.*
4. Schuette AJ, Dannenbaum MJ, Cawley CM, Barrow DL. Indocyanine green videoangiography for confirmation of bypass graft patency. *J Korean Neurosurg Soc.*
5. Hui FK, Schuette AJ, Lieber M, et al. Epsilon aminocaproic acid in angiographically negative subarachnoid hemorrhage is safe: A retrospective review of 83 consecutive patients. *Neurosurgery*.
6. Schuette AJ, Blackburn SL, Bain MD, Cawley CM, Barrow DL. Pial arteriovenous fistula resulting from ventriculostomy. *Neurosurgery*.

#### BOOK CHAPTERS

1. Barrow DL, Wood JH. Cerebral resuscitation. In: Chernow B, Lake CR (eds.). *Pharmacologic Approach to the Critically-Ill Patient*. Baltimore, MD: Williams & Wilkins, 1983:159-181.
2. Tindall GT, Barrow DL, Tindall SC. The surgical treatment of prolactinomas. In: Uozumi T, Sakoda K (eds.). *Functioning Pituitary Adenomas*. Osaka, Japan: Proceedings of the Fourth Workshop on Pituitary Tumors, 1984:51-68.
3. Bakay RAE, Fiandaca MS, Barrow DL. Laminar and circumferential alterations in inhibitory neurotransmitter receptor density in the development of an epileptic focus using the alumina primate model. In: Nistico G, Morselli PL, Lloyd KG, Fariello RG, Engel J (eds.). *Neurotransmitters, Seizures, and Epilepsy III*. New York, NY: Raven Press, 1986:303-318.
4. Barrow DL, Tindall GT. Neuroendocrine physiology, pathophysiology, and management. In: Wirth FP, Ratcheson RA (eds.). *Concepts in Neurosurgery, Vol. 1, Neurosurgical Critical Care*. Baltimore, MD: Williams & Wilkins, 1987:109-131.
5. Barrow DL. Neurologic functions. In: Davis JH, Drucker WR, Foster RF, et al (eds.). *Clinical Surgery, The C.V. St. Louis, MO: Mosby Co.*, 1987:119-142.
6. Bakay RAE, Barrow DL, Fiandaca MS, Iuvone PM, Schiff A, Collins DC. Biochemical and behavioral correction of MPTP Parkinson-like syndrome following fetal cell transplantation. In: Azmitia EF, Bjorkland A (eds.). *Cell and Tissue Transplantation into the Adult Brain. Annals of the New York Academy of Sciences, Vol.495*. New York, NY: The New York Academy of Sciences, 1987:623-640.
7. Tindall GT, Sweeney KM, Barrow DL. Management of prolactin-secreting pituitary macroadenomas. In: Blackwell RE, Chage RJ (eds.). *Prolactin-related Disorders. Proceedings of a Symposium*. Florham Park, NJ: Macmillan Healthcare Information, Inc., 1988:123-129.
8. Colbassani H, Barrow DL. Intracranial aneurysms. In: Lubin MF, Walker HK, Smith RB (eds.). *Medical Management of the Surgical Patient*, 2nd edition. Woburn, MA: Butterworth Publishers, 1988:620-621.
9. Barrow DL, Tindall GT. Transsphenoidal surgery. In: Lubin MF, Walker HK, Smith RB (eds.). *Medical Management of the Surgical Patient*, 2nd edition. Woburn, MA: Butterworth Publishers, 1988:625-627.
10. Friedlander LD, Barrow DL, Bakay RAE. New methods of diagnosis and treatment of ischemic visual loss. In: Blodi F, Brancato R, Christini G, et al. *Alta XXV Concilium Ophthalmologicum. Scuderi GN (eds.). Proceedings of the International Congress of Ophthalmology*. Rome, Italy: Kugler & Ghedini, 1988:384-403.
11. Barrow DL, Tindall GT. Giant pituitary tumors. In: Long DM (ed.). *Current Therapy in Neurological Surgery*, 2nd edition. Burlingon, Ontario, Canada B.C.: Decker, Inc., 1989:127-131.

12. Bierbrauer K, Barrow DL, O'Brien M. Review of seventeen patients with medulloblastoma under the age of four years. In: Marlin AE (ed.). *Concepts in Pediatric Neurosurgery*, Vol. 9. Basel, Switzerland: Karger Publishing, 1989:110-121.
13. Tindall GT, Barrow DL. Tumors of the sellar and parasellar area in adults. In: Youmans JR (ed.). *Neurological Surgery*, 3rd edition. Philadelphia, PA: W.B. Saunders, 1989: 3447-3498.
14. Woodard EJ, Barrow DL. Clinical presentation of arteriovenous malformations. In: Barrow DL (ed.). *Intracranial Vascular Malformations*. Park Ridge, IL: American Association of Neurological Surgeons, 1990:53-61.
15. Tindall GT, Barrow DL, Tindall SC. Prolactinomas: operative management. In: Cooper PR (ed.). *Contemporary Diagnosis and Management of Pituitary Adenomas*. Park Ridge, IL: American Association of Neurological Surgeons, 1991:73-82.
16. Tindall GT, Woodard EJ, Barrow DL. Transsphenoidal excision of macroadenomas of the pituitary gland. In: Rengachary SS, Wilkins RH (eds.). *Neurosurgical Operative Atlas*, Vol. 1. Baltimore, MD: William & Wilkins, 1991:287-298.
17. Barrow DL, Nahai F. Omental and musculocutaneous free flaps for coverage of difficult neurosurgical wounds. In: Rengachary SS, Wilkins RH (eds.). *Neurosurgical Operative Atlas*, Vol. 1. Baltimore, MD: William & Wilkins, 1991:287-297.
18. Barrow DL, Clare CE. Carotid endarterectomy. In: Rengachary SS, Wilkins RH (eds.). *Neurosurgical Operative Atlas*, Vol. 2. Baltimore, MD: William & Wilkins, 1991:275-285.
19. Harris ME, Barrow DL. Carotid-cavernous sinus fistulas. In: Barrow DL (ed.). *Complications and Sequelae of Head Injury*. Park Ridge, IL: American Association of Neurological Surgeons, 1992:13-30.
20. Barrow DL, Mizuno J. Carotid endarterectomy: technical aspects and perioperative management. In: Awad IA (ed.). *Cerebrovascular Occlusive Disease and Brain Ischemia*. Park Ridge, IL: American Association of Neurological Surgeons, 1992:167-185.
21. Clare CE, Barrow DL. Infectious intracranial aneurysms causing intracerebral hemorrhage. In: Batjer HH (ed.). *Spontaneous Intracerebral Hemorrhage*. *Neurosurgical Clinics of North America*. Philadelphia, PA: W.B. Saunders, 1992:551-566.
22. Hoffman JC Jr, Barrow DL. Imaging in neuroendocrine disorders. In: Barrow DL, Selman WR (eds.). *Neuroendocrinology*. *Concepts in Neurosurgery*. Baltimore, MD: Williams & Wilkins, 1992:237-257.
23. Barrow DL. Ophthalmic segment aneurysms. In: Rengachary SS, Wilkins RH (eds.). *Neurosurgical Operative Atlas*, Vol. 2. Baltimore, MD: Williams & Wilkins, 1992:331-341.
24. Barrow DL, Tindall GT. Tumors of the pituitary gland. In: Morantz RA, Walsh J (eds.). *Handbook of Brain Tumors*. New York, NY: Marcel Dekker Inc., 1993:367-386.
25. Harris ME, Barrow DL. Neuroendocrine physiology and management. In: Andrews BT (ed.). *Neurosurgical Intensive Care*. New York, NY: McGraw-Hill, 1993:179-199.
26. Barrow DL, Krisht A. Cavernous malformations and hemorrhage. In: Awad IA, Barrow DL (eds.). *Cavernous Malformations*. Park Ridge, IL: American Association of Neurological Surgeons, 1993:65-80.
27. Barrow DL, Awad IA. Conceptual overview and management strategies. In: Awad IA, Barrow DL (eds.). *Cavernous Malformations*. Park Ridge, IL: American Association of Neurological Surgeons, 1993:205-213.
28. Tindall GT, Woodard EJ, Barrow DL. Pituitary adenomas: general commentary. In: Apuzzo MLJ (ed.). *Brain Surgery. Complication Avoidance and Management*, Vol. 1. New York, NY: Churchill Livingstone, 1993:269-276.
29. Barrow DL. Intraoperative angiography. In: Loftus CM, Traynelis VC (eds.). *Intraoperative Monitoring Techniques in Neurosurgery*. New York, NY: McGraw-Hill, 1993: 77-94.
30. Barrow DL, Krisht A. Cavernous sinus dural arteriovenous malformations. In: Awad IA, Barrow DL (eds.). *Dural Arteriovenous Malformations*. Park Ridge, IL: American Association of Neurological Surgeons, 1993:117-130.

31. Awad IA, Barrow DL. Conceptual overview and management strategies for dural arteriovenous malformations. In: Awad IA, Barrow DL (eds.). *Dural Arteriovenous Malformations*. Park Ridge, IL: American Association of Neurological Surgeons, 1993: 231-241.
32. Oyesiku NM, Barrow DL. Infectious, traumatic, and other unusual aneurysms. In: Awad IA (ed.). *Current Management of Cerebral Aneurysms*. Park Ridge, IL: American Association of Neurological Surgeons, 1993:243-275.
33. Barrow DL, Martin NA. Intraoperative imaging. In: Sebel PS, Fitch W (eds.). *Monitoring the Central Nervous System*. Oxford, England: Blackwell Scientific, 1994:330-355.
34. Barrow DL, Garcia-Bengochea J. Anterior communicating artery aneurysms. In: Carter LP, Spetzler RF (eds.). *Neurovascular Surgery*. New York, NY: McGraw-Hill, 1995: 701-715.
35. Barrow DL, Cawley CM. Clinical manifestations of giant intracranial aneurysms. In: Awad IA, Barrow DL (eds.). *Giant Intracranial Aneurysms*. Park Ridge, IL: American Association of Neurological Surgeons, 1995:35-49.
36. Barrow DL. Cavernous segment giant aneurysms. In: Awad IA, Barrow DL (eds.). *Giant Intracranial Aneurysms*. Park Ridge, IL: American Association of Neurological Surgeons, 1995:117-130.
37. Barrow DL, Awad IA. Conceptual synthesis and future outlook. In: Awad IA, Barrow DL (eds.). *Giant Intracranial Aneurysms*. Park Ridge, IL: American Association of Neurological Surgeons, 1995:277-282.
38. Barrow DL, Garcia-Bengochea J. Intracranial aneurysm surgery. In: Lubin MF, Walker HK, Smith RB (eds.). *Medical Management of the Surgical Patient, 3rd Edition*. Philadelphia, PA: J.B. Lippincott Co., 1995:599-601.
39. Dawson RC, Owens D, Barrow DL. A multidisciplinary approach to recalcitrant arteriovenous malformations of the brain. In: Maciunas R (ed.). *Endovascular Neurological Intervention*. Park Ridge, IL: American Association of Neurological Surgeons, 1995:201-216.
40. Tindall GT, Barrow DL. Tumors of the sellar and parasellar area in adults. In: Youmans JR (ed.). *Neurological Surgery, 4th edition*. Philadelphia, PA: W.B. Saunders, 1996: 2935-2969.
41. Barrow DL, Alleyne C. Aneurysms of the intracavernous carotid artery. In: Tindall GT, Cooper P, Barrow DL (eds.). *The Practice of Neurosurgery*. Baltimore, MD: Williams & Wilkins, 1996:2173-2210.
42. Barrow DL. Surgical management of arteriovenous malformations of the brain. In: Tindall GT, Cooper P, Barrow DL (eds.). *The Practice of Neurosurgery*. Baltimore, MD: Williams & Wilkins, 1996:2013-2032.
43. Harris ME, Barrow DL. Arterial dissection. In: Tindall GT, Cooper PC, Barrow DL (eds.). *The Practice of Neurosurgery*. Baltimore, MD: Williams & Wilkins, 1996:1899-1906.
44. Barrow DL. Spinal vascular malformations. In: Welch KMA, Caplan L, Reis D, Weir B, Siesjo B (eds.). *Primer on Cerebrovascular Diseases*. San Diego, CA: Academic Press, 1997:556-566.
45. Barrow DL, Cawley CM. Surgical techniques for lobar arteriovenous malformations: frontal temporal, parietal, occipital. In: Batjer HH (ed.). *Cerebrovascular Disease*. New York, NY: Lippincott-Raven Press, 1997:765-787.
46. Cawley CM, Barrow DL. Cavernous sinus dural arteriovenous malformations. In: Awad IA (ed.). *Techniques in Neurosurgery*. New York, NY: Raven Press, 1997:21(1):41-52.
47. Barrow DL, Clare CE, Fazel I. Penetrating vascular injuries of the head and neck. In: Aarabi B, Kaufman HH (eds.). *Missile Wounds of the Head and Neck, Volume II*. Park Ridge, IL: American Association of Neurological Surgeons, 1999:315-342.
48. Barrow DL, Frankel R. Microsurgical resection of arteriovenous malformations of the ventricular trigone. Rengachary SS, Wilkins RH (eds.). *Neurosurgical Operative Atlas, Volume VIII*. Park Ridge, IL: American Association of Neurological Surgeons, 1999:47-56.

49. Cawley CM, Barrow DL. Perimedullary arteriovenous fistulas. In: Barrow DL, Awad IA (eds.). *Spinal Cord Vascular Malformations*. Park Ridge, IL: American Association of Neurological Surgeons, 1999:147-160.
50. Barrow DL, Johnson WD. Historical perspective and classification of spinal arteriovenous malformations. In: Barrow DL, Awad IA (eds.). *Spinal Cord Vascular Malformations*. Park Ridge, IL: American Association of Neurological Surgeons, 1999:1-7.
51. Barrow DL, Awad IA. Conceptual overview and management strategies. In: Barrow DL, Awad IA (eds.). *Spinal Cord Vascular Malformations*. Park Ridge, IL: American Association of Neurological Surgeons, 1999:169-179.
52. Barrow DL, Alleyne CH Jr. Surgical approaches: deep and intraventricular lesions. In: Awad IA, Jafar JJ, Rosenwasser RH (eds.). *Vascular Malformations of the Central Nervous System*. Philadelphia, PA: Lippincott-Raven Publications, 1999:309-325.
53. Barrow DL, Alleyne CH Jr. Surgical approaches: spinal lesions. In: Awad IA, Jafar JJ, Rosenwasser RH (eds.). *Vascular Malformations of the Central Nervous System*. Philadelphia, PA: Lippincott-Raven Publishers, 1999:339-345.
54. Tang G, Barrow DL. Spina bifida. In: Morris PJ, Wood WC (eds.). *Oxford Textbook of Surgery, Second edition*. Oxford, UK: Oxford University Press, 2001:2749-2754.
55. Olson JJ, Barrow DL, Gilbert MR, Oyesiku NM. Intracranial tumours. In: Morris PJ, Wood WC (eds.). *Oxford Textbook of Surgery, Second edition*. Oxford, UK: Oxford University Press, 2001:2801-2828.
56. Barrow DL. Hydrocephalus. In: Morris PJ, Wood WC (eds.). *Oxford Textbook of Surgery, Second edition*. Oxford, UK: Oxford University Press, 2001:2845-2848.
57. Barrow DL. Commentary on stereotactic radiosurgery for dural arteriovenous fistulae. In: Pollock BE (ed.). *Contemporary Stereotactic Radiosurgery. Technique and Evaluation*. Armonk, NY: Futura Publishing Company, 2002:109-138.
58. Tang G, Cawley CM, Barrow DL. Intraoperative monitoring techniques during aneurysm surgery. I. LeRoux PD, Winn HR, Newell DW (eds.). *Management of Cerebral Aneurysms*. Philadelphia, PA: Saunders, 2003:583-591.
59. Zhang YJ, Dion JE, Barrow DL, Cawley CM. Endovascular therapy for cavernous sinus vascular lesions. *Techniques in Neurosurgery*. 2003;8(4):238-250.
60. Cawley CM, Barrow DL, Dion JE. Treatment of lateral-sigmoid and sagittal sinus dural arteriovenous malformations. In: Winn R (ed.). *Youman's Neurological Surgery, 5<sup>th</sup> edition*. Philadelphia, PA: W.B. Saunders, 2004:2283-2291.
61. Barrow DL. Giant internal carotid artery-superior hypophyseal artery aneurysm. In: Kobayashi S (ed.). *Neurosurgery of Complex Vascular Lesions and Tumors*. New York, NY: Thieme, 2005:26-31.
62. Narayan P, Barrow DL. Minimally invasive techniques in vascular neurosurgery. In: Black P McL, Proctor MR (eds.). *Minimally Invasive Neurosurgery*. Totowa, NJ: Humana Press, 2005:331-344.
63. Zhang YJ, Barrow DL, Cawley CM, Dion JE. Surgical management of intracranial dural arteriovenous fistulas. In: Lawton MT (ed). *Controversies in Neurological Surgery*. New York, NY: Thieme, 2006.
64. Zhang YJ, Barrow DL, Cawley CM. Intracranial aneurysm surgery. In: Smith RB III, Lubin MF, Dodson TF, Spell N, Walker HR (eds.). *Medical Management of Surgical Patients, 4<sup>th</sup> ed.* New York: Cambridge University Press, 2006.
65. Cawley CM, Dion JE, Oyesiku NM, Barrow DL. Combined treatment: the team approach. In: Stieg P, Batjer HH, Samson D (eds.). *Intracranial Arteriovenous Malformations*. New York, NY: Informa Healthcare, 2006:139-200.
66. Alleyne CH Jr, Barrow DL. Internal carotid aneurysms-supraclinoid. In: Sekhar L, Fessler R (eds.). *Atlas of Neurosurgical Techniques*. New York, NY: Theime, 2007.
67. Zhang YJ, Cawley CM, Dion JE, Barrow DL. Surgical treatment of Intracranial Dural Arteriovenous Fistulas. In: Lawton MT, Gress D, Higashida R (eds). *Controversies in Neurological Surgery*. New York, NY: Thieme, 2006:150-156.

68. Barrow DL, Samuels O. Ischemic and hemorrhagic stroke. In (Laws, ER, ed.). *Comprehensive Review of Neurosurgery*. Birmingham, AL: CMEinfo/Oakstone Publishing, 2010.
69. Dannenbaum MJ, Rahimi S, Schuette AJ, Cawley CM, Barrow DL. Natural history of giant intracranial aneurysms. In: Abdulrauf S (ed.). *Cerebral Revascularization: Techniques in Extracranial-to-Intracranial Bypass Surgery*. Philadelphia, PA: Elsevier, 2011:225-230.
70. Mason AM, Cawley CM, Barrow DL. Surgical management of middle cerebral artery aneurysms. Chapter 370. In: Winn R (ed.). *Youman's Neurological Surgery*, 6th edition. Philadelphia, PA: W.B. Saunders, 2011.

#### IN PRESS

71. Rahimi SY, Cawley CM, Dannenbaum M, Barrow DL. Surgical techniques of terminal basilar and posterior cerebral artery aneurysm. In: Quinones-Hinojosa A (ed.). *Schmidke and Sweet Operative Neurosurgical Techniques: Indications, Methods and Techniques*. Philadelphia, PA: Elsevier.
72. Zhang J, Dion JE, Cawley CM, Barrow DL. Carotid cavernous fistulas. In: McDonald C (ed.). *Neurosurgical Operative Atlas: Vascular Neurosurgery*. New York, NY: Thieme.
73. Schuette AJ, Cawley CM, Barrow DL. Spinal dural fistulas—natural history, risk factors, decision analysis, endovascular, radiosurgical and surgical techniques. In: Bendok BR, Naidich AM, Walker MT, Batjer HH (eds.). *Hemorrhagic and Ischemic Stroke: Surgical, Interventional, Imaging and Medical Approaches*. New York: Thieme.
74. Schuette AJ, Cawley CM, Barrow DL. CNS vascular malformations. In: Biller J (ed.). *Evidence Based Management of Stroke/CNS Vascular*. Shropshire, UK: TFM Publishing.
75. Howard B, Schuette AJ, Barrow DL: Cavernoma Surgery Pearls and Pitfalls. In, Jabbour P (ed.), *Neurovascular Surgical Techniques*. Maryland Heights, MO: Jaypee Brothers Medical Publishers.

#### BOOKS AND MONOGRAPHS

1. Tindall GT, Barrow DL. *Disorders of the Pituitary*, The C.V. St. Louis, MO: Mosby Co., 1986.
2. Barrow DL. *Intracranial Vascular Malformations. Neurosurgical Topics*. Park Ridge, IL: American Association of Neurological Surgeons, 1990.
3. Barrow DL. *Complications and Sequelae of Head Injury. Neurosurgical Topics*. Park Ridge, IL: American Association of Neurological Surgeons, 1992.
4. Barrow DL, Selman WR. *Neuroendocrinology. Concepts in Neurosurgery*. Baltimore, MD: Williams & Wilkins, 1992.
5. Barrow DL. *Surgery of Cranial Nerves of the Posterior Fossa. Neurosurgical Topics*. Park Ridge, IL: American Association of Neurological Surgeons, 1993.
6. Awad IA, Barrow DL. *Dural Arteriovenous Malformations*. Park Ridge, IL: American Association of Neurological Surgeons, 1993.
7. Awad IA, Barrow DL. *Cavernous Malformations*. Park Ridge, IL: American Association of Neurological Surgeons, 1993.
8. Awad IA, Barrow DL. *Giant Intracranial Aneurysms*. Park Ridge, IL: American Association of Neurological Surgeons, 1995.
9. Hadley MN, Barrow DL. *Dialogues in Neurological Surgery*. St. Louis, MO: Quality Medical Publishing, 1995.
10. Tindall GT, Cooper P, Barrow DL. *The Practice of Neurosurgery*. Baltimore, MD: Williams & Wilkins, 1996.
11. Alleyne CH, Barrow DL: *Neurosurgery Board Review: Questions and Answers for Self-Assessment*. Tindall SC, Oyesiku NM, Washington TM, Hunter S, Owens DS, Harper FN (eds.). New York, NY: Thieme Medical Publishers, Inc., 1997.

12. Barrow DL, Awad IA. *Spinal Cord Vascular Malformations*. Park Ridge, IL: American Association of Neurological Surgeons, 1999.
13. Barrow DL, Kondziolka D, Laws E, Traynelis V. *Fifty Years of Neurosurgery. The Golden Anniversary of the Congress of Neurological Surgeons*. Baltimore, MD: Lippincott, Williams and Wilkins, 2000.
14. Barrow DL. *The Cavernous Sinus, Techniques in Neurosurgery*. Philadelphia, PA: Lippincott, Williams and Wilkins, 2003.

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