

# Vertebrobasilar Ischemia and Hemorrhage

Clinical Findings, Diagnosis, and Management of Posterior Circulation Disease

Second Edition

Cambridge University Press  
978-0-521-76306-6 - Vertebrobasilar Ischemia and Hemorrhage: Clinical Findings, Diagnosis, and Management of Posterior Circulation Disease: Second Edition  
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Frontmatter  
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Second Edition

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CAMBRIDGE  
UNIVERSITY PRESS

University Printing House, Cambridge CB2 8BS, United Kingdom

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[www.cambridge.org](http://www.cambridge.org)  
Information on this title: [www.cambridge.org/9780521763066](http://www.cambridge.org/9780521763066)

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First published 1996 by Blackwell Science

Second edition 2015

Printed in the United Kingdom by Bell and Bain Ltd

*A catalogue record for this publication is available from the British Library*

*Library of Congress Cataloguing in Publication data*

Caplan, Louis R., author.

[Posterior circulation disease]

Vertebrobasilar ischemia and hemorrhage : clinical findings, diagnosis, and management of posterior circulation disease / Louis R. Caplan. – Second edition.

p. ; cm.

Preceded by: Posterior circulation disease : clinical findings, diagnosis, and management / Louis R. Caplan. c1996.

Includes bibliographical references and index.

ISBN 978-0-521-76306-6 (hardback)

I. Title.

[DNLM: 1. Cerebrovascular Disorders. 2. Cerebrovascular Circulation.

3. Vertebrobasilar Insufficiency. WL 355]

RC388.5

616.8’1–dc23 2014043720

ISBN 978-0-521-76306-6 Hardback

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Contents

Foreword to the first edition – C. Miller Fisher xi  
Preface xiii

Section I General Features of Cerebrovascular Disease in the Posterior Circulation

1 **Historical background** 3  
Early history 3  
Anatomy and pathology: the sixteenth, seventeenth, and eighteenth centuries 4  
The nineteenth and early twentieth centuries 5  
Development of knowledge about the causes of stroke 5  
Ischemia 5  
Hemorrhage 7  
The modern era (1975–present) 10  
Advances in diagnostic technology 10  
Stroke data banks and registries 10  
Stroke units, stroke specialists, and stroke nurses 11  
Advances in medical and surgical therapy and randomized trials 11  
Acute reperfusion using thrombolytic drugs, thrombus removal with devices, and direct angioplasty and stenting 12  
Interventional techniques to treat potential bleeding cranial lesions: aneurysms and vascular malformations 13  
Posterior circulation strokes 13  
Hemorrhage 13  
Ischemia 15  
References 21

2 **Basic anatomy and pathology** 29  
Brain anatomy 30  
Brainstem and thalamus 30  
Arterial anatomy 38  
Venous anatomy 49  
Vascular pathology 51  
Large artery atherosclerosis 51  
Penetrating small artery disease 52

Arterial dissections 54  
Embolism 55  
Dolichoectasia (dilatative arteriopathy) 56  
Fibromuscular dysplasia (FMD) 57  
Arterial aneurysms and subarachnoid hemorrhage (SAH) 57  
Vascular malformations 59  
Parenchymal hemorrhage (ICH) 62  
Venous occlusions 64  
Systemic hypotension and hypoperfusion 64  
Other less common vasculopathies 65  
References 67

3 **Signs and symptoms and their clinical localization** 74  
Visual perception and related deficits 75  
Visual field defects 75  
Visual inattention and neglect 80  
Abnormal visual perceptions and distortions 80  
Complex disorders of visual perception 81  
Other cognitive and behavioral abnormalities including agnosias, alexia, and aphasia 85  
Left hemisphere lesions, including the thalamus 85  
Visual agnosia and visual anomia 87  
Right hemispherical lesions including the thalamus 87  
Nonvisual behavioral and cognitive abnormalities most often associated with bilateral cerebral hemispherical or thalamic lesions 88  
Reduced level of consciousness 92  
Anatomy and physiology 92  
Intrinsic brainstem vascular lesions and coma 94  
Extrinsic lesions 94  
Motor abnormalities 95  
Limb abnormalities and gait 95  
Bulbar muscle motor abnormalities 100  
Vestibular and oculomotor abnormalities 105  
The vestibuloocular reflex and its abnormalities 105

Contents

	Vestibular and oculomotor abnormalities at various anatomical loci	107
	<b>Sensory abnormalities</b>	112
	Somatosensory	112
	Hearing	115
	Taste	116
	<b>Pupillary size and reactivity</b>	117
	<b>Autonomic dysfunctions including abnormalities of cardiac and respiratory control and micturition</b>	117
	Anatomy and physiology	117
	Clinical autonomic and cardiorespiratory abnormalities	119
	<b>References</b>	121
4	<b>Diagnosis: clinical, imaging, and laboratory</b>	133
	<b>Method of clinical diagnosis</b>	133
	The sequential steps in diagnosis	134
	The inductive method: sequential hypothesis generation and testing	134
	Pattern matching	135
	Diagnosis of the <i>what</i> and <i>where</i> questions should proceed concurrently	135
	Mimicking a computer	135
	<b>The frequency of various findings in the New England Medical Center Posterior Circulation Registry (NEMC-PCR)</b>	135
	Frequency of the location of infarcts within the posterior circulation territories generally and according to stroke mechanisms and arterial lesions	136
	Frequency of symptoms and signs according to posterior circulation territories	137
	Frequency of risk factors according to the presence and location of occlusive vascular lesions	140
	<b>Common patterns of ischemia/infarction</b>	140
	Patterns within the proximal intracranial posterior circulation territory	142
	Patterns within the middle intracranial posterior circulation territory	142
	Patterns within the distal intracranial posterior circulation territory	143
	<b>Diagnosis in the emergency room</b>	143
	<b>Investigations</b>	143
	Brain imaging	143
	Vascular imaging and functional testing	145
	Blood tests	151
	Evaluation of the heart and aorta	152
	Brainstem reflexes and electrophysiological techniques	154
	<b>Question-driven imaging and laboratory evaluation</b>	155
	<b>References</b>	158
5	<b>Treatment</b>	163
	<b>Introduction</b>	163
	<b>Acute ischemic stroke</b>	163
	Maximizing blood flow	163
	Reperfusion strategies	164
	<b>Stroke prevention</b>	168
	Surgery	168
	Angioplasty and stenting	168
	Surgically bypassing regions of blockage	170
	Prevention of clot formation, propagation, and embolism	170
	<b>References</b>	174
	<b>Section II Posterior Circulation Ischemia: Specific Vascular Sites and Conditions</b>	
6	<b>Extracranial occlusive disease: innominate, subclavian, and vertebral arteries</b>	181
	<b>The development of ideas and information</b>	181
	Subclavian artery occlusive disease	181
	The subclavian steal syndrome	182
	Proximal vertebral artery occlusive disease	183
	<b>Causes, frequency, and epidemiology of arterial lesions at various neck sites</b>	184
	Frequencies and demography	184
	Etiologies	185
	<b>Symptoms, signs, and stroke mechanisms</b>	194
	Innominate artery	194
	Subclavian artery	194
	Proximal vertebral artery lesions	195
	Dissections of the V <sub>2</sub> and V <sub>3</sub> portions of the vertebral artery in the neck	200
	<b>Diagnostic evaluation</b>	201
	Physical examination of the supplying arteries and the upper limbs	201
	Ultrasound	201
	Vascular imaging: CTA and MRA, and catheter angiography	202
	<b>Treatment</b>	203
	Medical treatment	203
	Surgical treatment	205
	Angioplasty and stenting	206
	Summary of present state of therapy	207
	<b>References</b>	207
7	<b>Intracranial vertebral arteries and the proximal intracranial territory</b>	214
	<b>Background and development of ideas</b>	215
	Lateral medullary infarction	215
	Hemimedullary and medial medullary infarction	226
	Cerebellar infarction in PICA territory	229

ICVA disease	230
<b>Clinical findings in patients with proximal posterior circulation intracranial territory infarcts</b>	238
Lateral medullary infarcts	238
Medial medullary infarcts	243
Cerebellar infarction in PICA distribution	244
<b>Findings in the New England Medical Center Posterior Circulation Registry</b>	245
ICVA vascular lesions	245
Proximal intracranial posterior circulation territory infarcts	252
Conclusions from NEMC-PCR data	253
<b>Diagnosis and treatment</b>	253
Diagnosis	253
Treatment	255
<b>References</b>	257
<b>8 Basilar artery</b>	263
<b>Development of ideas</b>	264
Early clinico-anatomical necropsy-based reports of basilar artery occlusion	264
Kubik and Adams's classical report on the pathology and syndrome of basilar artery occlusion and subsequent series of cases	267
Transient prodromal symptoms: "vertebrobasilar insufficiency" and its management with anticoagulants	272
"Top-of-the-basilar" embolism	275
Improved brain and vascular imaging allowed safer and more rapid clinical diagnosis	277
Posterior circulation stroke registries	279
<b>Pathology, pathophysiology, and frequency of vascular lesions</b>	279
Atherosclerosis	279
Embolism	281
Dissection	282
Aneurysms and dilatative arteriopathy	283
<b>Other, less common causes</b>	285
<b>Symptoms and signs</b>	287
Pontine ischemia and the middle posterior circulation intracranial territory	287
Upper brainstem ischemia as part of the "top-of-the-basilar" syndrome	293
<b>Reports of outcomes in patients with basilar artery disease before the NEMC-PCR and the BASICS studies</b>	297
<b>Basilar artery lesions in the NEMC Posterior Circulation Registry</b>	298
Summary conclusions from NEMC posterior circulation data	304
<b>The Basilar Artery International Cooperative Study (BASICS) registry</b>	304
<b>Clinical and laboratory diagnosis</b>	305
<b>Treatment</b>	306
Reperfusion after acute basilar artery occlusion	306
Antithrombotic treatment	309
<b>References</b>	312
<b>9 Posterior cerebral arteries</b>	320
<b>Background and development of ideas</b>	321
Occipital lobe anatomy and physiology	321
Anatomy of the cerebral arterial supply	323
Clinical studies	325
<b>Pathology and frequency of vascular lesions and stroke mechanisms</b>	343
<b>Clinical symptoms and signs</b>	345
Unilateral PCA stenosis and occlusion	346
Bilateral PCA territory infarcts	351
Frequency of various symptoms and signs	353
<b>PCA and PCA territory vascular lesions in the New England Medical Center Posterior Circulation Registry</b>	354
Distribution and location of infarctions	354
Stroke mechanisms	355
<b>Diagnosis</b>	358
<b>Treatment</b>	361
<b>References</b>	363
<b>10 Penetrating arteries</b>	369
<b>Development of ideas about the pathology that causes small deep infarcts</b>	369
Lacunes	369
Intracranial branch atheromatous disease	373
<b>Development of knowledge about the anatomy of posterior circulation branches</b>	375
<b>Signs, symptoms, and syndromes in penetrating branch artery disease at various brainstem sites</b>	377
Medulla oblongata	377
Pons	381
Midbrain	389
Thalamus	395
<b>The New England Medical Center Posterior Circulation Registry experience</b>	410
<b>Diagnosis</b>	412
<b>Treatment of patients with branch artery occlusive disease</b>	413
<b>References</b>	414
<b>11 Cerebellar infarcts</b>	421
<b>Essential cerebellar brain and vascular anatomy and physiology</b>	422
Brain anatomy and functions	422

Contents

Vascular anatomy 424

**Development of ideas about cerebellar lesions and infarcts 427**

**Cerebellar infarcts: distribution, general clinical signs, outcome, and etiologies 433**

**Posterior inferior cerebellar artery (PICA) territory cerebellar infarcts 436**

**Anterior inferior cerebellar artery (AICA) territory cerebellar infarcts 440**

**Superior cerebellar artery (SCA) territory cerebellar infarcts 444**

**Multiple cerebellar artery territory infarcts 448**

**Small, nonterritorial cerebellar infarcts 451**

**Pseudotumoral space-occupying cerebellar infarcts 452**

**Hemorrhagic cerebellar infarcts 456**

**Concluding comments 457**

**References 458**

12 **Migraine 462**

**Background information about migraine 462**

**Migraine “auras” and accompaniments 464**

**Basilar artery migraine 467**

**Vascular and hematological abnormalities 469**

**Migrainelike conditions 470**

Reversible cerebral vasoconstriction syndrome 470

Bartleson syndrome 471

Strokelike migraine attacks after radiation therapy 471

Cerebral autosomal dominant arteriopathy with subcortical infarcts and leukoencephaly 471

**Differentiation of migrainous accompaniments from atherostenosis-related brain ischemia 472**

**“Migrainous strokes” 473**

**Summary and conclusions 478**

**References 479**

13 **Venous and dural sinus thrombosis 484**

**Anatomy 484**

**Development of ideas 486**

**Etiologies 487**

Infections 487

Hormonal factors: pregnancy, postpartum, oral contraceptives 487

Hematological conditions and coagulopathies 487

Intracranial tumors 488

Systemic inflammatory conditions 488

Dural fistulas 488

Idiopathic (cause not identified) 488

**Distribution of the venous structures involved 488**

**General clinical features 489**

Demography 489

Mode of onset 490

Headache 490

Seizures 491

Decreased level of consciousness 491

Focal neurological symptoms/signs and focal brain imaging lesions 491

Outcomes 492

**Thrombosis of venous structures that drain the structures within the posterior circulation 492**

Lateral sinus thrombosis 492

Deep vein occlusions 493

Cortical and cerebellar vein occlusions 495

**Diagnosis 496**

Clinical 496

D-dimer measurements 498

Computed tomography 498

Magnetic resonance imaging 498

Transcranial Doppler 500

**Treatment 500**

**References 502**

Section III Posterior Circulation Hemorrhage

14 **Parenchymatous hemorrhage 511**

**General considerations 511**

Causes 511

Growth of hematomas 515

Clinical course and general symptoms and signs 515

**Historical background 516**

**Hemorrhages at various posterior circulation sites 517**

Pontine hemorrhages 517

Cerebellar hemorrhages 522

Thalamic hemorrhages 527

Midbrain hemorrhages 533

Medullary hemorrhages 536

**References 537**

15 **Subarachnoid hemorrhage, aneurysms, and vascular malformations 542**

**Subarachnoid hemorrhage and intracranial aneurysms 542**

Development of ideas 542

Distribution of posterior circulation aneurysms and SAH 546



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Louis R. Caplan  
Frontmatter  
[More information](#)

Contents

Clinical findings 550  
Clinical and imaging diagnosis 552  
Treatment 554  
**Vascular malformations 556**  
Development of ideas 556  
Types and locations of malformations 557  
Cavernous angiomas 559  
Developmental venous anomalies 563

Telangiectasias 565  
Arteriovenous malformations 565  
Dural arteriovenous fistulas 571  
**References 575**

*Index* 587

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# Foreword to the first edition

Until the 1950s there was no therapy for the stroke patient and accuracy in diagnosis mattered not at all. A stroke was a stroke. With the introduction of anticoagulants and vascular surgery, medicine was for the first time faced with the task of investigating the pathology and pathophysiology of the many types of cerebrovascular disease and laying down rules for diagnosis and management. Knowledge burgeoned spearheaded by angiography, CT, and MRI, and more recently, neurosonography, MRA, and MR diffusion. The specialty of **stroke neurology** has become extremely intricate and in no aspect is this more true than in the vertebral-basilar territory.

This volume is eloquent testimony to the very special talents of Dr. Caplan. From his vast practical experience, he has

composed the complete document, wherein is recorded in lucid, fluent prose, virtually every known detail about strokes involving the brainstem, cerebellum, and thalami. It is *the* authoritative statement of Dr. Caplan and will be required reading for the stroke neurologist who would be compleat.

There are different levels of endeavor in clinical medicine; only the top rank have particular appeal. Alas many physicians practice out their careers, mediocre. In these pages, Dr. Caplan's disciples will be guided to the profound satisfaction of practicing near-perfect neurology.

*C. Miller Fisher  
Boston, Mass,  
May, 1995*

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Disease: Second Edition  
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# Preface

My interest in posterior circulation vascular disease was stimulated early during my stroke fellowship in 1969, by an encounter with a patient who developed cortical blindness, severe agitation, and loss of memory while in the hospital. Later during that year, under the tutelage of Dr. C. Miller Fisher I thoroughly studied and reported eye movement abnormalities in patients with midbrain and thalamic infarcts and ptosis among stroke patients. Ever since then I have been fascinated by the plethora of symptoms and signs that develop in patients with lesions within the brain structures fed by posterior circulation vessels, a territory that makes up less than a quarter of the volume of the brain. I have made the study of neurological phenomena attributable to vascular-related injury to this territory and to clinical posterior circulation disease the focus of my life's work. This monograph on disease of the posterior circulation represents my "magnum opus."

I am a devotee of medical history. I do not believe that one can conjure up a path to the future, or even estimate where one is now, without knowing the past developments and ideas and how they evolved. For that reason I have included a chapter on history, and began each chapter with historical developments in the topic covered by the chapter. The first edition was published in 1996, at a time when I did not have available some of the final results in the New England Medical Center – Posterior Circulation Registry (NEMC-PCR). This registry included over 400 thoroughly studied patients and was and is the largest accumulation of patients with ischemic posterior circulation disease. I included in the first edition ideas, events, findings, and opinions about posterior circulation disease that preceded the NEMC-PCR as well as the preliminary results in this registry. Since then, there have been major advances in brain imaging, more clinical-anatomical and clinical-pathological reports, and more interest and results of treatment. I have attempted to bring the topic up-to-date (a process which took 3 years of effort) by including a thorough reporting of my own work and that of others that followed the 1996 publication of the first edition.

I and this volume owe much to others. I am heavily indebted to Dr. C. Miller Fisher, my mentor. It was he that set me along

the path and guided me during the subsequent 40 years. My other mentors in Neurology – Dr. Derek Denny-Brown, the Neurology department chair during my neurology residency, and Drs. Flaviau Romanul, Raymond Adams, and E.P. Richardson were also wise physicians that heavily influenced my early training. My colleagues on the various stroke services also merit my thanks – Drs. Chaim Mayman, Arthur Rosenbaum, and Nick Zervas at the Beth Israel Hospital in Boston during 1970–1978; Dr. J.P. Mohr who worked with me on the Harvard Stroke Registry during that time; Drs. Dan Hier, Phil Gorelick, Robert Stein, and Cathy Helgason at the Michael Reese Hospital in Chicago during 1978–1984; Drs. Michael Pessin, Sam Wolpert, and Dana DeWitt at the New England Medical Center during 1984–1998; and Drs. Robert Edelman, Steve Warach, Magdy Selim, Sandeep Kumar, Ajith Thomas, and Gottfried Schlaug at the Beth Israel Deaconess Medical Center in Boston during 1998–2014. Many former stroke fellows also took an active part in the registry and in publications thereafter, especially Drs. Barbara Tettenborn, Conrado Estol, Hui-Meng Chan, Ching Sang-Chung, Robert Wityk, Axel Rosengart, Pierre Amarenco, Claudia Chaves, Joan Breen, Kostantino Vemmos, and Ladislav Pazdera. During the writing of the first edition, I spent time in the medical libraries in Mannheim, Germany with the help of Dr. Michael Hennerici, and in Utrecht, Netherlands with the help of Dr. Jan van Gijn. I am grateful to Drs. Ajith Thomas and Christopher Ogilvy, Neurosurgery colleagues at Beth Israel Deaconess Medical Center who reviewed the chapter on subarachnoid hemorrhage, aneurysms, and vascular malformations and offered suggestions.

My long-term very loyal secretary Pauline Dawley typed the first edition and helped greatly with the update. Nick Dunton and his Cambridge University Press colleagues deserve thanks for making the material into a first-rate publication. Loretta Baron, the Nurse who shepherded the NEMC-PCR patients, was extremely helpful in ensuring that the registry got done in the best fashion. Neurology residents and stroke fellows at the various hospitals have always helped with data accumulation, ideas, and recovering images for publication. My wife Brenda has been a loyal supporter

Preface

despite my many hours away from home while working on this volume. My children Laura, Daniel, Jonathan, David, Jeremy, and Benjamin have always been supportive of their father. Most of all I owe an enormous debt to the patients whose disease represents the matter of this volume – I hope in some way their illnesses have helped with understanding posterior circulation disease and will be some guidance for care for future patients.