

Cambridge University Press

978-1-107-02664-3 - Pearls and Pitfalls in Head and Neck and Neuroimaging: Variants and Other Difficult Diagnoses

Nafi Aygun, Gaurang Shah and Dheeraj Gandhi

Frontmatter

[More information](#)

Pearls and Pitfalls in HEAD AND NECK AND NEUROIMAGING

Variants and Other
Difficult Diagnoses

Cambridge University Press
978-1-107-02664-3 - Pearls and Pitfalls in Head and Neck and Neuroimaging: Variants and Other Difficult Diagnoses
Nafi Aygun, Gaurang Shah and Dheeraj Gandhi
Frontmatter
[More information](#)

Cambridge University Press

978-1-107-02664-3 - Pearls and Pitfalls in Head and Neck and Neuroimaging: Variants and Other Difficult Diagnoses

Nafi Aygun, Gaurang Shah and Dheeraj Gandhi

Frontmatter

[More information](#)

Pearls and Pitfalls in HEAD AND NECK AND NEUROIMAGING

Variants and
Other Difficult
Diagnoses

Nafi Aygun

Associate Professor of Radiology and Director of the Neuroradiology Fellowship Program, Johns Hopkins University, Baltimore, MD, USA

Gaurang Shah

Associate Professor of Radiology, University of Michigan Health System, Ann Arbor, MI, USA

Dheeraj Gandhi

Professor of Radiology, Neurology and Neurosurgery at the University of Maryland School of Medicine, Baltimore, MD, USA



CAMBRIDGE
UNIVERSITY PRESS

CAMBRIDGE
UNIVERSITY PRESS

University Printing House, Cambridge CB2 8BS, United Kingdom

Published in the United States of America by Cambridge University Press, New York

Cambridge University Press is part of the University of Cambridge.

It furthers the University’s mission by disseminating knowledge in the pursuit of education, learning and research at the highest international levels of excellence.

www.cambridge.org
Information on this title: www.cambridge.org/9781107026643

© Cambridge University Press 2013

This publication is in copyright. Subject to statutory exception and to the provisions of relevant collective licensing agreements, no reproduction of any part may take place without the written permission of Cambridge University Press.

First published 2013

Printed in Spain by Grafos SA, Arte sobre papel

A catalog record for this publication is available from the British Library

Library of Congress Cataloging in Publication data

Aygun, Nafi.
Pearls and pitfalls in head and neck and neuroimaging / Nafi Aygun, Gaurang Shah, Dheeraj Gandhi.
p. ; cm.

Includes bibliographical references.
ISBN 978-1-107-02664-3 (Hardback)
I. Shah, Gaurang. II. Gandhi, Dheeraj. III. Title.
[DNLM: 1. Neuroimaging–methods. 2. Central Nervous System Diseases–diagnosis. 3. Diagnosis, Differential. 4. Otorhinolaryngologic Diseases–diagnosis. WL 141.5.N47] RC349.D52
616.8’04754–dc23 2013010572

ISBN 978-1-107-02664-3 Hardback

Cambridge University Press has no responsibility for the persistence or accuracy of URLs for external or third-party internet websites referred to in this publication, and does not guarantee that any content on such websites is, or will remain, accurate or appropriate.

.....
Every effort has been made in preparing this book to provide accurate and up-to-date information which is in accord with accepted standards and practice at the time of publication. Although case histories are drawn from actual cases, every effort has been made to disguise the identities of the individuals involved. Nevertheless, the authors, editors and publishers can make no warranties that the information contained herein is totally free from error, not least because clinical standards are constantly changing through research and regulation. The authors, editors and publishers therefore disclaim all liability for direct or consequential damages resulting from the use of material contained in this book. Readers are strongly advised to pay careful attention to information provided by the manufacturer of any drugs or equipment that they plan to use.

To my parents, Vrindavan and Vinu Shah, for their love and support; Kinnari, for taking the journey with me; and Sharvil and Sahil, for bringing joy into our lives.

Gaurang Shah

To Bobby, my best friend and life partner and for Shreya and Diya, my beautiful daughters and the love of my life.

Dheeraj Gandhi

Cambridge University Press
978-1-107-02664-3 - Pearls and Pitfalls in Head and Neck and Neuroimaging: Variants and Other Difficult Diagnoses
Nafi Aygun, Gaurang Shah and Dheeraj Gandhi
Frontmatter
[More information](#)

Contents

Preface ix

Section 1 Cerebrovascular diseases

- Case 1 Dense basilar artery sign 1
- Case 2 Global anoxic brain injury 4
- Case 3 Acute infarction 8
- Case 4 Vertebral artery dissection 10
- Case 5 Subacute infarct 13
- Case 6 Subarachnoid hemorrhage 17
- Case 7 Intracranial aneurysms 21
- Case 8 Giant aneurysms 23
- Case 9 Acute intracerebral hematoma 26
- Case 10 Cerebral amyloid angiopathy 30
- Case 11 Primary CNS vasculitis 34
- Case 12 Reversible cerebral vasoconstriction syndrome 37
- Case 13 Moyamoya disease/syndrome 40
- Case 14 Cortical venous thrombosis 43
- Case 15 Developmental venous anomalies 46
- Case 16 Dural arteriovenous fistula 49
- Case 17 Cavernous malformation 52

Section 2 Demyelinating and inflammatory diseases

- Case 18 Tumefactive demyelinating lesion 55
- Case 19 Acute disseminated encephalomyelitis 58
- Case 20 Progressive multifocal leukoencephalopathy 62
- Case 21 Osmotic myelinolysis 65
- Case 22 Neurosarcoidosis 72

Section 3 Tumors

- Case 23 Posterior fossa masses in children 80
- Case 24 Low-grade glioma 92
- Case 25 Diffuse intrinsic pontine glioma 105
- Case 26 Pseudoprogression of GBM 109
- Case 27 Pseudoresponse in treatment of GBM 112
- Case 28 Low-grade oligodendroglioma 114
- Case 29 Primary CNS lymphoma 116
- Case 30 Pineal region tumors 125
- Case 31 Intraventricular masses 140
- Case 32 Colloid cyst 153
- Case 33 Primary intraosseous meningioma 161
- Case 34 Suprasellar meningioma 171
- Case 35 Pituitary macroadenoma 180

Section 4 Infectious diseases

- Case 36 Brain abscess 191
- Case 37 Neurocysticercosis 194
- Case 38 Tuberculosis 198
- Case 39 Creutzfeldt–Jakob disease 207
- Case 40 Herpes encephalitis 210

Section 5 Metabolic and neurodegenerative conditions

- Case 41 Wernicke’s encephalopathy 213
- Case 42 Hypertrophic olivary degeneration 217
- Case 43 Adrenoleukodystrophy 219

Section 6 Trauma

- Case 44 Mild traumatic brain injury 224
- Case 45 Isodense subdural hematoma 227

Section 7 Miscellaneous

- Case 46 Posterior reversible encephalopathy syndrome 229
- Case 47 Late-onset adult hydrocephalus secondary to aqueductal stenosis 232
- Case 48 Intracranial hypotension 234
- Case 49 Idiopathic intracranial hypertension 238
- Case 50 Rathke’s cleft cyst 240

Section 8 Artifacts and anatomic variations

- Case 51 FLAIR sulcal hyperintensity secondary to general anesthesia 245
- Case 52 Virchow–Robin spaces 250
- Case 53 Arachnoid granulations 255
- Case 54 Benign external hydrocephalus 257
- Case 55 Pitfalls in CTA 260
- Case 56 Asymmetric pneumatization of the anterior clinoid process 264

Section 9 Skull base

- Case 57 Fibrous dysplasia of skull base 267
- Case 58 Sphenoid bone pseudolesion 271
- Case 59 Clival lesions 276
- Case 60 Perineural spread 282

Contents

Section 10 Temporal bone

- Case 61 Cochlear dysplasia 285
- Case 62 Labyrinthitis ossificans 289
- Case 63 Superior semicircular canal dehiscence 292
- Case 64 Fluid entrapment in the petrous apex cells 294
- Case 65 Acquired cholesteatoma 299
- Case 66 Malignant otitis externa 304
- Case 67 Temporal bone fractures 307

Section 11 Paranasal sinuses

- Case 68 Allergic fungal sinusitis 310
- Case 69 Invasive fungal sinusitis 316
- Case 70 Spontaneous CSF leaks and sphenoid cephaloceles 324
- Case 71 Juvenile nasal angiofibroma 328

Section 12 Orbits

- Case 72 Idiopathic orbital pseudotumor 331
- Case 73 Optic neuritis 336

Section 13 Salivary glands

- Case 74 Intraparotid lymph nodes 342
- Case 75 Benign mixed tumor 344
- Case 76 First branchial cleft cyst 350

Section 14 Neck

- Case 77 Nasopharyngeal cysts 354
- Case 78 Cystic nodal metastasis 357
- Case 79 Low-flow vascular malformations 360
- Case 80 Parapharyngeal masses 364

Section 15 Thyroid and parathyroid

- Case 81 Third branchial apparatus anomaly 370
- Case 82 Parathyroid adenoma 372
- Case 83 String sign 378

Section 16 Vessels

- Case 84 Carotid artery dissection 381
- Case 85 Traumatic arterial injury 384

Section 17 Spinal column

- Case 86 Craniovertebral junction injuries 387
- Case 87 Odontoid fractures 390
- Case 88 Vertebral compression fractures 398
- Case 89 Sacral insufficiency fracture 401
- Case 90 Paget’s disease of the spine 405
- Case 91 Renal osteodystrophy 409
- Case 92 Calcific tendinitis of the longus colli 414

Section 18 Intervertebral discs

- Case 93 T2 hyperintense disc herniation 419
- Case 94 Disc herniation and cord compression 424
- Case 95 Postoperative disc herniation versus postsurgical scarring 427
- Case 96 Degenerative endplate alterations 430

Section 19 Spinal canal contents

- Case 97 Spinal dysraphism 434
- Case 98 Tethered spinal cord 445
- Case 99 Chiari I malformation 449
- Case 100 Spinal vascular malformations 455
- Case 101 Cord compression 458
- Case 102 Demyelinating/inflammatory spinal cord lesion 466
- Case 103 Subacute combined degeneration 469
- Case 104 Intradural cyst 471
- Case 105 Spinal CSF leaks 475
- Case 106 Leptomeningeal drop metastases 478

Index 486

Preface

“A teacher is one who makes himself progressively unnecessary.”
– Thomas Carruthers

It is with a great sense of pride that we introduce our endeavor entitled *Pearls and Pitfalls in Head and Neck and Neuroimaging*. We hope that this book will be fun to read and foster the understanding of difficult diagnoses and common pitfalls in Neuroimaging.

The three authors have different backgrounds and sub-specialty Neuroimaging expertise, but have one thing in common – the love and passion for teaching the residents and fellows. This has resulted in accumulation of thousands of teaching files in our respective libraries. Years spent with the trainees in the reading room in wonderful academic institutions have given us an understanding of diagnoses that are commonly missed and imaging findings that are likely to be misinterpreted.

While a number of excellent books exist on the subject and practice of Neuroradiology, a book like this is unique. It aims to cover the lacunae that commonly exist in the knowledge of Neuroimaging and gives clarity to diagnoses that are difficult to make with certainty.

After deciding to proceed with this project, the three of us brainstormed and came up with 106 topics that we wanted to

cover. These topics were divided into 19 sections. Each chapter is concise, yet gives a comprehensive overview of the subject matter.

We understand that time is precious and therefore wanted to create a resource that is precise and trustworthy. It is our hope that this treatise is easy to follow, unpretentious, and helpful.

The authors would like to thank all the Cambridge University Press staff who helped us tremendously every step of the way. In particular, we express our gratitude to Nisha Doshi and Beata Mako. Gaurang would also like to express his gratitude to Suresh Mukherji, Mark Shiroishi, Sanjay Jain, Prasan Rao, Jayant Narang and Mohammad Arabi for sharing their images and wisdom.

Our sincere thanks to the clinicians working with us for providing ever so important clinical feedback and learning that comes with it. Last but not the least, we thank our families for their unconditional support and patience during the writing of this project.

We hope that the readers will enjoy reading this book. We are open to any suggestions or criticism that the readers may have for its improvement and look forward to hearing from you.

Nafi, Gaurang, and Dheeraj