



Thrombus Characteristics Are Related to Collaterals and Angioarchitecture in Acute Stroke

Emmad M. Qazi, Sung Il Sohn, Sachin Mishra, Mohammed A. Almekhlafi, Muneer Eesa, Christopher D. d'Esterre, Abdul A. Qazi, Josep Puig, Mayank Goyal, Andrew M. Demchuk, Bijoy K. Menon

Original Article – Can J Neurol Sci. 2015; 42: 383

Figure: Clot length depends on the extent of pial collaterals and on angio-architecture (branching pattern) around the original clot. (A) Panel A depicts a typical ICA MCA cerebral arterial tree. (C-F) Panel C-F show varying clot lengths according to variability in pial collateral status and angioarchitecture around original clot (B; legends). (C) Panel C depicts a short overall clot length with minimal stasis around original clot (blue) from good collaterals and efficient branching patterns. (D) Panel D depicts longer clot resulting from inefficient angio-architecture (see absence of branching arteries around original clot; dotted vessels) despite good collaterals. (E) Panel E shows a longer clot predominantly because of poor collaterals. (F) Panel F shows very long clots because of poor collaterals and inefficient angio-architecture (absence of branching arteries around original clot).

AN INTERNATIONAL JOURNAL PUBLISHED BY THE CANADIAN NEUROLOGICAL SCIENCES FEDERATION

The official Journal of: The Canadian Neurological Society, The Canadian Neurosurgical Society, The Canadian Society of Clinical Neurophysiologists, The Canadian Association of Child Neurology

Our Major Supporters



The CNSF's relationship with all its sponsors, exhibitors and supporters is an excellent one; based on honesty, integrity and transparency.

Industry supports the CNSF throughout the year; at our Congress, through our Journal and in our other CPD activities. Industry is very generous year after year in their provision of unrestricted and unconditional grants to the CNSF.

The CNSF's major supporters are listed below, none of whom have had any input into the CNSF's CPD programs, nor the Congress sessions they support. Our supporters are not involved in the selection of any of the Congress courses, program content or speakers.

THANK YOU.

The CNSF values the support it has received in 2015 from...

PLATINUM



BIOGEN IDEC which includes support of the Lunch 'n Learn on Multiple Sclerosis, the Co-developed session on Multiple Sclerosis, the Delegate Gift, the purchase of 2 Exhibit booths and advertising in Neuro|News.

GOLD



BIOCODEX which includes support of the Lunch 'n Learn on Dravet's Syndrome, the purchase of 2 booths, support of the Congress Course Notes website and advertising in Neuro|News.

NOVARTIS which includes support of the Grand Plenary, the purchase of 2 Exhibit booths and advertising in Neuro|News.

SILVER



ALLERGAN which includes support of the Headache SIG, the Headache Course, the Lunch 'n Learn on chronic migraine and the purchase of an Exhibit booth.

EISAI which includes support of the Epilepsy Video Sig and the Course Epilepsy Through the Years: from Childhood to Adult, Neuro |News Advertising and the purchase of an Exhibit Booth.

GRIFOLS which includes the sponsorship of the Neuromuscular SIG and Neuromuscular Course and the purchase of an Exhibit booth and for provided funding for an EMG fellowship to the CSCN.

SCOTIABANK which includes support of the Lunch 'n Learn on financial planning and the Residents' Social.

UCB CANADA INC. which includes support of the Fairmont branded key cards, the Exhibitors Reception and the purchase of an Exhibit booth.

BRONZE



EMD SERONO which includes support of the Multiple Sclerosis Course.



GENZYME which includes support of the Lanyards and the purchase of 2 Exhibit booths.



SUNOVION which includes support of the Sudden Death Related to Epilepsy Course and the purchase of an Exhibit booth.



TEVA CANADA INNOVATION which includes the purchase of 2 Exhibit booths and advertising in Neuro|News.

Volume 42 / Number 6 / November 2015

EDITORIAL

- 357** Treatment of Cervicogenic Headache: New Insights on the Treatment of Pain in the Neck

Prin Chitsantikul, Werner J. Becker

REVIEW ARTICLE

- 360** The Utility of Positron Emission Tomography in Epilepsy

Jorge G. Burneo, Raymond Poon, Sarah Kellett, O. Carter Snead 3rd

COMMENTARY

- 372** Use of Natalizumab in Patients with Multiple Sclerosis: 2015 Update

Paul W. O'Connor, Marcelo Kremenchutzky

ORIGINAL ARTICLES

- 381** Thrombus Characteristics Are Related to Collaterals and Angioarchitecture in Acute Stroke

Emmad M. Qazi, Sung Il Sohn, Sachin Mishra, Mohammed A. Almekhlafi, Muneer Eesa, Christopher D. d'Esterre, Abdul A. Qazi, Josep Puig, Mayank Goyal, Andrew M. Demchuk, Bijoy K. Menon

- 389** Trajectories of Behavioural Disturbances Across Dementia Types

Alexandra B. Linds, Alana B. Kirstein, Morris Freedman, Nicolaas P.L.G. Verhoeff, Uri Wolf, Tiffany W. Chow

- 395** Cognitive and Motor Aspects of Parkinson's Disease Associated with Dysphagia

Ji Sun Kim, Jinyoung Youn, Mee Kyung Suh, Tae-Eun Kim, Juhee Chin, Suyeon Park, Jin Whan Cho

- 401** Motor Cortex Stimulation for Neuropathic Pain: A Randomized Cross-over Trial

Julia A.E. Radic, Ian Beauprie, Paula Chiasson, Zelma H.T. Kiss, Robert M. Brownstone

- 410** Diagnosis and Management of Spinal Metastasis of Glioblastoma

Patricia Tai, Arbind Dubey, Muhammad Salim, Khanh Vu, Rashmi Koul

- 414** Lidocaine for Status Epilepticus in Pediatrics

Frederick A. Zeiler, Kaitlin J. Zeiler, Jeanne Teitelbaum, Lawrence M. Gillman, Michael West, Colin J. Kazina

- 427** Comparison of Intracranial Neuroendoscopic Procedures in Children versus Adults

Fady Girgis, Roberto Diaz, Walter Hader, Mark Hamilton

- 436** Significance of Non-phase Locked Oscillatory Brain Activity in Response to Noxious Stimuli

Raphaël Duport Rouleau, Lydia Lagrandeur, Kathya Daigle, Dominique Lorrain, Guillaume Léonard, Kevin Whittingstall, Philippe Goffaux

NEUROIMAGING HIGHLIGHTS

- 444** Diplopia and Ptosis as the Initial Manifestations of Acquired Hepatocerebral Degeneration

Jiguo Gao, Xiaoke Wang, Wei Wu, Xiujuan Wu, Hongliang Zhang

- 446** Pituitary Infarct Masquerading as a Pituitary Abscess

Hyun Seok Choi, Bom-yi Kim, Yong-Kil Hong

- 448** Damage to the Median and Ulnar Nerves After a Snake Bite

Giampietro Zanette, Matteo Francesco Lauriola, Stefano Tamburin

BRIEF COMMUNICATIONS

- 450** Spasticity Health Literacy Among Canadian Family Physicians

Joshua Goldstein, Chetan P. Phadke, Farooq Ismail, Chris Boulias

- 454** Fourth Ventricle Choroid Plexus Xanthogranuloma Causing Hydrocephalus

Craig Ferguson, Simon Walling, Alexander Easton, Jai Jai Shiva Shankar

- 457** Cerebral Metastasis Presenting after Complete Primary Resection of Atrial Myxoma: Case Report

Ian Côté, John Sinclair, John Woulfe, Rafael Glikstein, John Veinot

Volume 42 / Number 6 / November 2015

- 461** Dissecting Aneurysm of the Recurrent Artery of Heubner in a Patient With Osteogenesis Imperfecta

Kevin Mansfield, Ralph Rahme

CLINICAL NEUROPATHOLOGICAL CONFERENCE

- 466** Acute Myelopathy in a 68-Year-Old Male

Murad Altukustani, Jennifer Mandzia, Chris Watling, Paul Cooper, Basem Bahakeem, Andrew Leung, Irene Gulka, Christopher Howlett, Robert Hammond

HISTORICAL ARTICLE

- 472** The Canadian Management of Bovine Spongiform Encephalopathy in Historical and Scientific Perspective, 1990-2014
Alexandra E. Quimby, Michel C.F. Shamy

LETTER TO THE EDITOR

- 482** Biceps Brachii Botulinum Toxin Injections: To Be or Not to Be
Farooq Ismail, Chetan P. Phadke, Chris Boulias

Editor-in-Chief/Rédacteur en chef

Robert Chen TORONTO, ON

Associate Editors/Rédacteurs associés

Mary Connolly VANCOUVER, BC

Edward Fon MONTREAL, QC

Robert Hammond LONDON, ON

Hans Katzberg TORONTO, ON

Mahendranath Moharir TORONTO, ON

Tejas Sankar EDMONTON, AB

Jeanne Teitelbaum MONTREAL, QC

Past Editors/Anciens rédacteurs en chef

G. Bryan Young LONDON, ON

Douglas W. Zochodne CALGARY, AB

James A. Sharpe TORONTO, ON

Robert G. Lee CALGARY, AB

Robert T. Ross WINNIPEG, MB

(Emeritus Editor, Founding Editor)

Editorial Board/Comité éditorial

Jorge Burneo LONDON, ON

Richard Desbiens QUEBEC CITY, QC

David Fortin SHERBROOKE, QC

Mark Hamilton CALGARY, AB

Hans-Peter Hartung DUSSELDORF, GERMANY

Michael Hill CALGARY, ON

Alan C. Jackson WINNIPEG, MB

Daniel Keene OTTAWA, ON

James Perry TORONTO, ON

Oksana Suchowersky EDMONTON, AB

Brian Toyota VANCOUVER, BC

Brian Weinshenker ROCHESTER, MN, USA

Samuel Wiebe CALGARY, AB

Elaine Wirrell ROCHESTER, MN, USA

SECTION EDITORS/CONSEIL DE RÉDACTION

**Neuroimaging Highlights /
Neuroimagerie**

Manas Sharma LONDON, ON

**Neuropathological Conference/
Conférence sur la neuropathologie**

Robert Hammond LONDON, ON

Book Review/Critiques de livres

Reflections/Reflets

Andrew Kirk SASKATOON, SK

**Critically Appraised Topic Summaries
(CATS)**

Jorge Burneo LONDON, ON

Mary Jenkins LONDON, ON

Editorial Review Board/Comité de lecture

Donald Brunet KINGSTON, ON

Jodie Burton CALGARY, AB

Lionel Carmant MONTREAL, QC

Colin Chalk MONTREAL, QC

K. Ming Chan EDMONTON, AB

Joseph Dooley HALIFAX, NS

Paolo Federico CALGARY, AB

Daryl Fourney SASKATOON, SK

Hannah Glass SAN FRANCISCO, CA, USA

Alan Goodridge ST. JOHNS, NL

Ian Grant HALIFAX, NS

Alan Gruberman OTTAWA, ON

John Hurlbert CALGARY, AB

Manouchehr Javidan VANCOUVER, BC

Patrick McDonald WINNIPEG, MB

Martin McKeown VANCOUVER, BC

Joseph Megyesi LONDON, ON

Vivek Mehta EDMONTON, AB

Steven Miller TORONTO, ON

Neelan Pillay CALGARY, AB

Christopher Power EDMONTON, AB

Alex Rajput SASKATOON, SK

Jean Raymond MONTREAL, QC

Gary Redekop VANCOUVER, BC

Harvey Sarnet CALGARY, AB

John Stewart VANCOUVER, BC

Jeanne Teitelbaum MONTREAL, QC

Eve Tsai OTTAWA, ON

Shannon Venance LONDON, ON

Matt Whetley EDMONTON, AB

Jerome Yager EDMONTON, AB

Journal Staff/Effectif du Journal

Dan Morin CALGARY, AB

Chief Executive Officer

The official journal of: / La Revue officielle de:

The Canadian Neurological Society

La Société Canadienne de Neurologie

The Canadian Neurosurgical Society

La Société Canadienne de Neurochirurgie

The Canadian Society of Clinical Neurophysiologists

La Société Canadienne de Neurophysiologie Clinique

The Canadian Association of Child Neurology

L'Association Canadienne de Neurologie Pédiatrique

The permanent secretariat for the four societies and the Canadian Neurological Sciences Federation is at:

Le secrétariat des quatre associations et de la Fédération des sciences neurologiques du Canada est situé en permanence à :

7015 Macleod Trail SW, Suite 709

Calgary, Alberta, Canada T2H 2K6

CNSF (403) 229-9544 / CJNS (403) 229-9575

Fax (403) 229-1661

The Canadian Journal of Neurological Sciences is published bi-monthly. The annual subscription rate for Individuals (electronic) is £111/\$184. The annual subscription rate for Institutions (electronic) is £125/\$207. See <www.journals.cambridge.org/cjn> for full details including taxes; e-mail: subscriptions_newyork@cambridge.org. The Canadian Journal of Neurological Sciences is included in the Cambridge Journals Online service, which can be accessed at www.journals.cambridge.org. For information on other Cambridge titles, visit www.cambridge.org. For advertising rates contact M. J. Mrvica Associates, 2 West Taunton Avenue, Berlin, NJ 08009; Phone: 856-768-9360; Fax: 856-753-0064; Email: mjmrvica@mrvica.com.

Le Journal Canadien des Sciences Neurologiques est publié tous les deux mois. Le prix d'abonnement annuel pour les individus (électronique) est 111£/184\$. Le prix d'abonnement annuel pour les établissements (électronique) est 125£/207\$. Veuillez consulter <www.journals.cambridge.org/cjn> pour tous les détails, y compris les taxes; email: subscriptions_newyork@cambridge.org. Le Journal canadien des sciences neurologiques est inclus dans le service Cambridge Journals Online, accessible à www.journals.cambridge.org. Pour plus d'informations sur les titres disponibles chez Cambridge, veuillez consulter www.cambridge.org. Pour les tarifs de publicité, contacter M. J. Mrvica Associates, 2 West Taunton Avenue, Berlin, NJ 08009; Téléphone: (1)856-768-9360; Email: mjmrvica@mrvica.com.

This journal is indexed by / Cette revue est indexée par:
Adis International, ArticleFirst, BIOBASE, BioLab, BiolSci, BIOSIS Prev, Centre National de la Recherche Scientifique, CSA, CurAb, CurCont, De Gruyter Saur, E-psyche, EBSCO, Elsevier, EMBASE, FRANCIS, IBZ, Internationale Bibliographie der Rezensionen Geistes- und Sozialwissenschaftlicher Literatur, MEDLINE, MetaPress, National Library of Medicine, OCLC, PE&ON, Personal Alert, PsycFIRST, PsycINFO, PubMed, Reac, RejZh, SCI, SCOPUS, Thomson Reuters, TOCprem, VINITI RAN, Web of Science.

ISSN: 0317-1671

EISSN: 2057-0155

COPYRIGHT © 2015 by THE CANADIAN JOURNAL OF NEUROLOGICAL SCIENCES INC. All rights reserved. No part of this publication may be reproduced, in any form or by any means, electronic, photocopying, or otherwise, without permission in writing from Cambridge University Press. Policies, request forms and contacts are available at: <http://www.cambridge.org/about-us/rights-permissions>. Permission to copy (for users in the U.S.A.) is available from Copyright Clearance Center: <http://www.copyright.com>, email: info@copyright.com.

COPYRIGHT © 2015 du THE CANADIAN JOURNAL OF NEUROLOGICAL SCIENCES INC. Tous droits réservés.
 Aucune partie de cette publication ne peut être reproduite, sous quelque forme ou par quelque procédé que ce soit, électronique ou autre, y compris la photocopie, sans l'accord écrit de Cambridge University Press. Les politiques, les formulaires de demande et les contacts sont disponibles à: <http://www.cambridge.org/about-us/rights-permissions>. La permission de copier (pour les utilisateurs aux États-Unis) est disponible auprès Copyright Clearance Center: <http://www.copyright.com>, email: info@copyright.com.