



KEMENTERIAN PENDIDIKAN DAN KEBUDAYAAN
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NO. 261 /UN3.1.1/KP/2020**

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Demikian surat keterangan ini dibuat untuk dapat dipergunakan sebagaimana mestinya.

Surabaya, 13 April 2020
Dekan



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**UNIVERSITAS AIRLANGGA
FAKULTAS KEDOKTERAN**

LAMPIRAN : Surat Keterangan Dekan Fakultas Kedokteran Universitas Airlangga No. 261 /UN3.1.1/KP/2020 Tanggal 13 April 2020
Tentang Staf Pengajar Departemen Ilmu Bedah Saraf yang diberi tugas melaksanakan kegiatan Pembimbing Tugas Akhir Skripsi S1 Pendidikan Dokter dan Program Pendidikan Dokter Spesialis 1 (PPDS-1) Ilmu Bedah Saraf Fakultas Kedokteran Universitas Airlangga Tahun 2018.

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THESIS

NEUROANGIOGRAPHY PATTERNS AND ANOMALIES OF THE
MIDDLE CEREBRAL ARTERY FROM 554 CEREBRAL ANGIOGRAPHY
RESULTS IN Dr. SOETOMO ACADEMIC MEDICAL CENTER HOSPITAL



Yunus Kuntawi Aji

MASTER'S DEGREE IN CLINICAL MEDICAL SCIENCE

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MASTER'S DEGREE IN CLINICAL MEDICAL SCIENCE

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SURABAYA

2019

A THESIS

Submitted in fulfilment of the requirements for the degree of

Master's Degree In Clinical Medical Science

In

MASTER'S DEGREE IN CLINICAL MEDICAL SCIENCE

FACULTY OF MEDICINE

UNIVERSITAS AIRLANGGA

By

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MASTER'S DEGREE IN CLINICAL MEDICAL SCIENCE

FACULTY OF MEDICINE

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SURABAYA

2019

STATEMENT OF ORIGINALITY

I confirm that this thesis is all my own work. Any work taken from other sources have been appropriately referenced and acknowledged.

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Date : January 7, 2019

STATEMENT OF VALIDATION

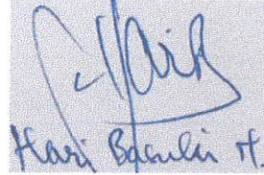
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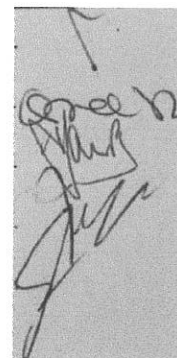
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Title : Neuroangiography Patterns and Anomalies of The Middle
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FOREWORD

This thesis is written as completion to the Master's Degree in Clinical Medical Science at Universitas Airlangga. Since February 2018 I have been conducting research on this topic. I have experienced this period as very interesting and instructive. My research question was formulated together with my supervisor. At the beginning I had little knowledge of the patterns and anomalies of the Middle Cerebral Artery. This research process was difficult and tiresome. However, I have been able to achieve a result I am very satisfied with.

I would like to thank my supervisors, Dr. Asra Al Fauzi, dr., Sp.BS(K) and Dr. Hari Basuki Notobroto, dr., M.Kes, and the board of examiners, Prof. Dr. Abdul Hafid Bajamal, dr., Sp.BS(K), Dr. Muhammad Arifin Parenrengi, dr., Sp.BS(K), and Dr. Sri Andreani Utomo, dr., Sp.Rad(K), for valuable input to this research. Their valuable insights and directions gave me needful guidance to complete the research and write this thesis.

I also wish to thank all the subjects, without whose cerebral angiography I would not have been able to conduct this research. To Institute of Research and Innovation (LPI) Universitas Airlangga and Endowment Fund for Education (LPDP) Ministry of Finance Republic of Indonesia for their financial support. To my colleagues, all the neurosurgery residents for their help and support. To all my teachers in Department of Neurosurgery Faculty of Medicine Universitas Airlangga for their excellent guidance and support during my residency program. Last but not least, my parents, Bapak Sugeng Tarwiji and Ibu Sri Wardani, my

wife, Mutia Prawitasari, and my daughter, Yassira Husna Kuntawiaji, deserve a particular note of thanks.

Surabaya, January 7, 2019

A square box containing a handwritten signature in black ink. The signature is stylized and appears to be 'Yunus Kuntawi Aji'.

Yunus Kuntawi Aji

LETTER OF APPROVAL FOR PUBLICATION

I am the student of Universitas Airlangga who signed below:

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ABSTRACT

NEUROANGIOGRAPHY PATTERNS AND ANOMALIES OF THE MIDDLE CEREBRAL ARTERY FROM 554 CEREBRAL ANGIOGRAPHY RESULTS IN Dr. SOETOMO ACADEMIC MEDICAL CENTER HOSPITAL

Yunus Kuntawi Aji

Objective: As the largest and most complex of cerebral arteries, Middle Cerebral Artery (MCA) patterns and anomalies are not thoroughly reported. Moreover, there is still some confusion on the criteria of these different subtypes. The study of MCA patterns and anomalies is important as their variants such as accessory branches or duplications represent a substantial risk for misadventure during endovascular embolization or blind navigation during treatment of ischemic stroke. The aim of this study is to review the neuroangiography patterns and anomalies of the MCA which have never been done in Indonesia.

Methods: Total 554 cerebral angiography data from 300 subjects were included in the study from dr. Soetomo Academic Medical Center Hospital during 2014-2018 period. Analysis and interpretation regarding the MCA patterns and variations/anomalies were done. Estimation of MCA patterns and anomalies in the population and association between MCA patterns/anomalies and aneurysm/AVM as well as between MCA patterns and anomalies also were described.

Results: The mean diameter and length of the MCA (M1) from our study was 2.39 mm and 15.56 mm, respectively. The proportion of early branching from our study was 6%. The most frequent length type of the MCA was short segment

(40.6%). The most frequent branching pattern of the MCA was medial bifurcation (46%). There were only two MCA anomalies found in this study, MCA accessory (1.1%) and duplication (3.1%).

Conclusions: The proportion of length types, branching patterns, accessory subtypes, and duplication subtypes of the MCA which, according to the best of our knowledge, never have been published in the english literature were described in this study.

Keywords: middle cerebral artery, neuroangiography, pattern, anomaly