

CHAPTER 1

INTRODUCTION

1.1 Study Background

Middle cerebral artery (MCA) is the largest and most complex of cerebral arteries, because the cerebral neocortex has significantly developed in humans.^{1,2} MCA covers a large part of the cerebral hemispheres and is therefore exposed during surgical intervention in this area. Aspects of cerebral branches tend to vary, different branching patterns can be described, and several anomalies can be observed. In the past, surgical interest in the MCA has been directed at avoiding damage to its branches during surgery performed within its territory. Microsurgical techniques have made reconstruction and bypass to the MCA, surgical approaches to MCA aneurysms, and resection of arteriovenous malformations (AVMs) related to MCA branches common procedures in vascular neurosurgery.²

The vascular territory of the MCA includes some of the most eloquent cortical areas for motor and sensory functions. It encompasses the receptive and expressive components of language, abstract thought, and other faculties of higher cognitive functioning. In addition, perforating branches of the proximal MCA supply the basal ganglia and important descending and corticospinal tracts.³

Knowledge of variations and anomalies is important and can be helpful to neurosurgeons and clinicians. Anatomical variations of the MCA have to be recognized when planning interventions to avoid damage or occlusion of

perforating vessels that arise from the MCA and to assess their contribution to the perfusion of the deep MCA territory.⁴

The diameter, length, absence and duplication of the MCA cortical branches are not thoroughly reported. Furthermore, descriptions of the origins and possible common trunks of these branches are still lacking in the literature. Bifurcation and trifurcation branching types are usually described, while most studies fail to mention the different subtypes. Moreover, there is still some confusion on the criteria of these different subtypes. The MCA anomalies are often mentioned in the literature, although the subtypes are rarely elaborated on. Variants of the middle cerebral artery, such as accessory branches or duplications, represent a substantial risk for misadventure during endovascular embolization or blind navigation during treatment of ischemic stroke.³ The aim of this study is to review the neuroangiography patterns and anomalies of the MCA.

1.2 Research Question

How are the neuroangiography patterns and variations/anomalies of the MCA and their estimation in the population from cerebral angiography results in dr. Soetomo Academic Medical Center Hospital?

1.3 Aims and Objectives

1. Identify the neuroangiography patterns and variations/anomalies of the MCA from cerebral angiography results in dr. Soetomo Academic Medical Center Hospital.