



STUDY OF ANATOMICAL VARIATION IN POSTERIOR CEREBRAL ARTERY & POSTERIOR COMMUNICATING ARTERY IN HUMAN CADEVER

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ABSTRACT

Study sample 50 well formalin preserved brain from cadavers in dissection hall of MGMs Medical College in year of 2018-19. Length is measured by thread and diameter measured by venire caliper. The origin and course of posterior cerebral artery & posterior communicating artery in all brains observed.

In present study the length of posterior cerebral artery is 1.1cm & diameter is 2.1mm so as compared to previous studies diameter is same but length is more.

KEYWORDS : posterior cerebral artery, posterior communicating artery, Human Cadavers

INTRODUCTION:

The brain is supplied by two internal carotid and two vertebral arteries. The branches of these arteries anastomosis on the inferior surface of the brain to form the circular arteriosus(1). The vessels contributing to the formation of circulus arteriosus are the anterior, middle and posterior cerebral arteries. Posterior cerebral artery is the terminal branch of basilar artery curves laterally backwards. Posterior communicating artery joins the posterior cerebral artery to the internal carotid artery(2).

Cerebral artery occlusion leads to infarction in the brain tissue. The occlusion is caused by stenosis, embolism or rupture of the arteries. Though many workers have reported abnormalities in the diameters of the vessels forming the Circle of Willis, the normal dimensions of these vessels have not been reported. The vessels have been described as narrow, thread like, string like but the actual diameter has rarely been measured. Most of the anatomical variations reported are related posterior cerebral and the posterior communicating arteries. However there are very few case reports regarding the variations encountered in the anterior cerebral arteries(3).

Hence the present study was undertaken to study the origin, length and diameter of posterior cerebral & posterior communicating arteries.

MATERIALS AND METHODS:

Study sample: Fifty well formalin preserved brains from cadavers in dissection hall of Mahatma Gandhi Missions Medical College, Aurangabad.

Instruments:

The instrumentation required were scalpel, forceps, scissors, measuring scale, brush, cotton, gloves, oil paint and vernier caliper.

METHOD:

The cadavers were placed in supine position. A pencil mark was made on the skull by encircling it horizontally. By making saw cut along the line skull cap was removed.

To remove the brain in one piece, the falx cerebri from the crista galli was detached. Falx pulled posteriorly. A block of wood placed under the shoulder to allow the head to fall back. This allows the frontal lobe to move out of anterior cranial fossa, the optic nerve, internal carotid, and infundibulum were

cut. The posterior part of hemisphere was raised with fingers, pressing the Pons further posteriorly and knife was passed into the vertebral canal in front of medulla oblongata cutting firmly from side to side. The brain was withdrawn from cranial cavity(4).

Fifty brains were removed from cranial cavity using the above procedure. The posterior cerebral & posterior communicating arteries were observed.

posterior cerebral artery studied in both sides from their origin. The origin course diameter, length and number is observed & posterior communicating artery is also observed.

RESULTS:

The origin and course of posterior cerebral artery in all brains were same.

In all the brains, the artery was found to be single. Hyperplasia was seen in 11 brains on the right side and 10 brains on the left side. (Table – 1,3) (Photograph1)

Posterior Communicating Artery

In all specimen the artery was single. In 21 brains it was narrow or string like. Absence of the artery was not observed. (Table-2) (photograph-2)

DISCUSSION :

Thomas Willis was the first scientist to describe the circulus arteriosus In 1662. He was born on 27 January great Bedwyn in Wiltshir England, the son of a farmer who lost his life at the blege of Oxford during civil war(5).

Variation in these arteries which is associated with attraction of blood flow to the brain, enhances the problem in vascular diseases of brain(6).

There are also different methods of studying these arteries, we can study by magnetic resonance imaging (MRI) or angiography.

In the present study origin & course posterior cerebral artery were studied and compared with the previous studies.

The diameter of the right posterior cerebral artery mentioned by Kamath S. in(1981) with dissection method was 2.1 mm. In the present study it is 2.1 mm(1).

The diameter of the left posterior cerebral artery mentioned by

Kamath S. in (1981) with dissection method was 2.2mm. In present study it is 2.2mm(1).

The diameters of both posterior cerebral arteries mentioned by Saeki N et al in (1977) in autopsy specimen were 2.6 mm(7).

The length of right and left posterior cerebral artery mentioned by Kamath S in(1981) with dissection method were 0.68cm and 0.69cm respectively. In the present study the length of both side is 1.1cm(1). (Table – 3, Graph 1 and 2).

Posterior Communicating Artery

Hypoplasia of post communicating arteries noted by Puchades-Orts et al in (1975) with dissection method was 51.6%(8).

In the presented study hypoplasia in the posterior communicating artery is 40%.

The percentage of absence of posterior communicating arteries noted by Puchades Orts et al in (1975) with dissection method was 2.4%. Reddy RD et al in (1972) with dissection method was 16%. In the present study the absence of posterior communicating artery is not found (1,9). (Table-2)

CONCLUSIONS:

The diameter of the posterior cerebral artery in the present study 2.1mm which coinciding with Kamath S which was 2.1mm. The length of the posterior cerebral artery according to Kamath S. 0.68cm. while in our findings it was 1.1 cm.(1)- (graph-1,2)

In our study there was not much deviation from the findings of other scientists in the diameter and length of posterior cerebral arteries.

The variations in the posterior communicating arteries showed significant variation in number, shape and size which was 40% as compared to Puchades-Orts et al who found 51.6%(8).

Table – 1 Variations of the Posterior Cerebral Artery

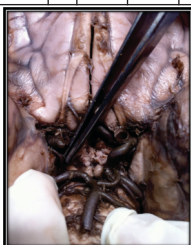
Observation	Rt.	Lt.	Total
	50	50	100
Hyperplasia	11	10	-
Hypoplasia	-	-	-
Duplication	-	-	-

Table No -2 Variations of Posterior Communicating Artery

Observations	Rt.	Lt.	Total
Posterior Communicating	50	50	100
Narrow or string like (Hypoplasia)	11	10	-
Dilated (Hyperplasia)	-	-	-
Absent	-	-	-
Normal	39	40	79

Table – 3 Descriptive Statistics - Posterior

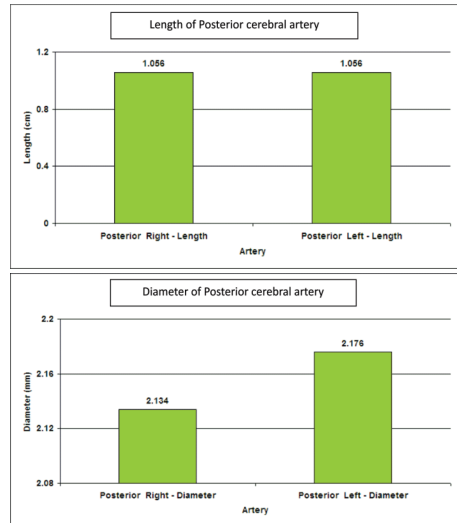
Posterior	N	Mini	Maxi	Mean	Std.	CV%
		mum	mum		Deviation	
Posterior Right - Length	50	1.00	1.20	1.0560	6.115E-02	5.79
Posterior Left - Length	50	1.00	1.20	1.0560	6.749E-02	6.39
Posterior Right - Diameter	50	1.50	3.00	2.1340	.4178	19.58
Posterior Left - Diameter	50	1.20	3.00	2.1760	.4488	20.63



1. Variations of the Posterior Cerebral Artery



Photograph showing diameter of posterior communicating artery



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