

Connections of Functional Areas of Subero Lateral Surface of Brain by Middle Cerebral Artery

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1. Introduction

In supero lateral surface of brain functional lobes are Frontal Lobe, Parietal Lobe, Temporal Lobe, Occipital Lobe and submerged cortex are present. Larger area of supero lateral surface is supplied by middle cerebral artery which is one of the terminal branch of internal carotid artery.

Motor area is the primary motor area 4.

Pre motor area is Secondary motor area

Supplimentary motor area 6

Affarent fibres from pre motor and supplementary motor area are passing through association fibres. Primary motor area controls highly skilled movements of opposite half of the body. The centre for voluntary control of micturation and defaecation are located in the anterior part of paracentral lobule. Lesion of paracentral gyrus produces the loss of specific movements of opposite side of the body. Supplementary motor area programmly the sequential motor function. Lesion causes unable to perform motor function, Loss of co-ordination in the movement of 2 limits. Lesion of primary motor and supplementary motor area result in spastic paralysis with exaggerated deep tendon reflex. Lesion of motor speech area 44 & 45 produces inability to speak what person think – motor aphasia. Lesion of premotor cortex 6 – writing centre.

Frontal eye field area controls the conjugate movement of eye ball present in posterior part of middle frontal gyrus. Prefrontal controls depth of feeling and understanding.

Sensory area is granular cortex. Sensory area 1,2,3, Secondary sensory area & Sensory associated area are present.

Primary visual area, Secondary visual area, Occipital eye field area are present. Auditory area, Auditory associated area are present. Thrombosis of middle cerebral artery produces spastic hemiplegia and hemisensory loss except leg of the opposite side. If the left middle cerebral artery is involves there will be Aphasia.

Cerebro vascular disease causes cerebral haemorrhage, Thrombosis and embolism. Spastic Hemiplegia of opposite side loss of sensation of opposite side occurs. If retro

lentiform part of internal capsule involves formation of hemiplegia.

Circulus arteriosus or circle of willis is an arterial arcade situated in the base of the brain in interpeduncular fossa. It is formed by anterior, middle and posterior cerebral artery. Perforating arteries which supply anterior limb of internal capsule. Central branches are 6 in numbers antero medial is the largest branches medial striate or recurrent artery of Heubner. Antero lateral are 2 groups. Largest is Lenticulostriate or charcot's artery of cerebral haemorrhage. Postero lateral & postero medial are present. Thrombosis of lateral striate of middle cerebral artery causes motor & sensory loss of most of

- Opposite side of body except lower limb.
- Hemiplegia is a common condition of upper motor Neuron paralysis.

The M4 describes the branches of the middle cerebral artery that passes nearly all the convex surface of the cerebral hemisphere aside from the frontal pole and posterior rim using the functional branching approach to Anatomy, the middle cerebral artery generally arises as a single trunk of 14-16 mm length and a diameter of approximately 3 mm to 6 mm majority of cases supplied by superior & inferior division.

2. Method

M1 Segment

Branches, Number, Gyrus to which enter any other artery to the same gyrus if so size of lumen of both. Size of lumen and its comparison with other terminal branches for all functional areas.

Termination of M1 segment and number of division:

- Termination of M1 segment and number of division are noted.
- Artery supply to the Broca's area.
- Artery supply to the frontal eye field.
- Artery to motor and sensory area.
- Artery supply to the sensory association cortex, wernick's area and auditory cortex.
- Central branch or the lenticulo striate branch.

3. Observation

- There is a branch from M1 segment if the orbito frontal which supplies Brocas and frontal eye field area.

- Lumen of superior division is 4 mm. there is a communication between the pre Rolandic and Rolandic branch.
 - There is a free communication between the pre Rolandic and anterior parietal.
 - Frontopolar branch from superior division in addition to Rolandic and pre rolandic comes to supply the Brocas area.
 - There are 2 connection between frontopolar and prefrontal branch.
 - There is communication between angular artery to the pre Rolandic branch.
 - In all cases size of lumen is same from origin to Termination.
 - There is free communication between 6 branches of superior division. All lumen size are same of 3 mm.
 - Pre Rolandic that enters in to the frontal eye field in the same specimen.
 - Posterior parietal comes from the superior division in the same specimen.
 - There is connection between the posterior temporal and angular artery. Lumen size are same as 3 mm.
 - There is connection between anterior and posterior parietal branch.
 - In three divisions first branch is acute . Second is right angle and third is acute angle of origin.
 - M1 segment length normal 14-16 mm and has 2 divisions.
 - 30 mm length is in 3 divisions – superior, middle & inferior.
 - Lumen size is uniform at origin to termination in 30 mm length of M1.
- Partial hemiparesis occurs in middle cerebral artery infarcts.
 - Hemianopsia occurs in middle cerebral artery infarct.
 - Middle cerebral artery stroke indicate a larger lesion affecting deep and superficial branch.
 - Inter corrections show liberal blood supply to functional lobes.
 - By the liberal blood supply infaction is minimal.
 - Three division of middle cerebral artery length is 30 mm.
 - There are liberal blood supply to functional lobes lumen size is same.

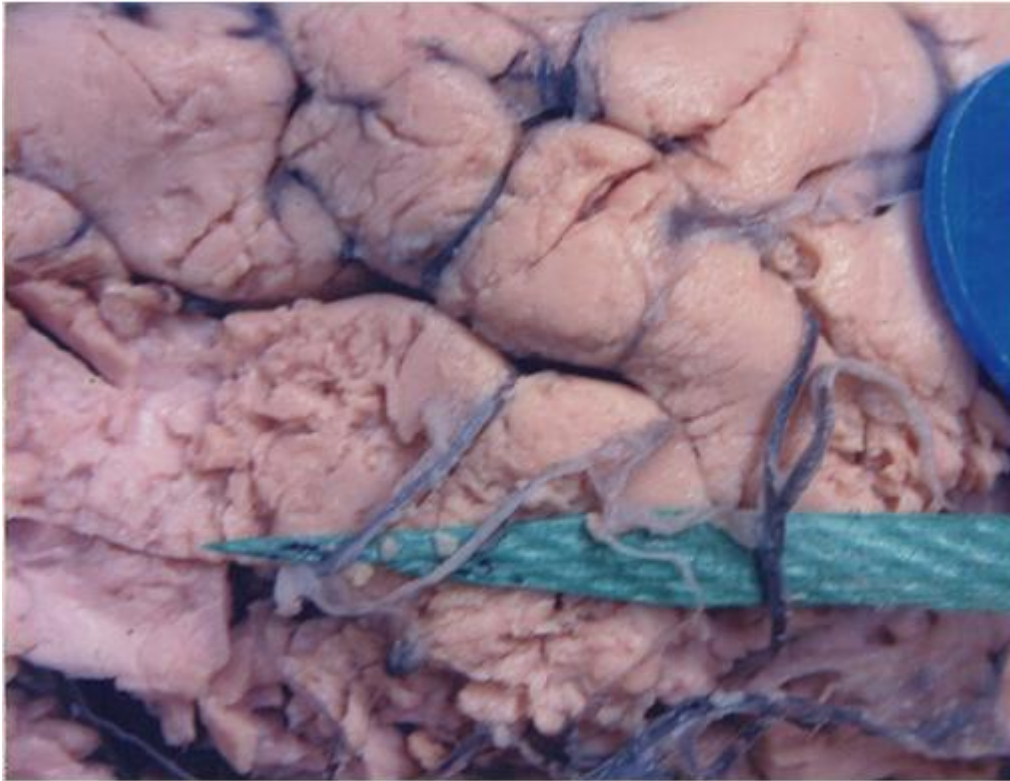
4. Conclusion

- Main trunk occlusion of either side yields contralateral hemiplegia.
- Trunk occlusion causes global aphasia.
- Superior division infarcts lead to contralateral deficits with involvement of upper extremity.
- Inferior division infarcts leads to Wernicke's aphasia.

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Inter Connection



Inter Connection 2

