**INTRODUCTION:**
In Brain 3 surfaces are supero lateral, medial surface, inferior surface are present. Functional lobes of supero lateral surface are Frontal lobe, Parietal lobe, Temporal lobe, Occipital lobe & submerged cortex. Blood supply is by middle cerebral to the following functional areas:
1. Primary motor area - 4
2. Premotor
3. Supplementary motor area – 6
4. Motor speech area
5. Functional eye field – 8
6. Pre frontal area
7. Sensory area
8. Secondary sensory area
9. Sensory associated area
10. Auditory area
11. Auditory association area
12. Primary visual area
1. Affarentfibres from pre motor and supplementary motor area are passing through association fibres.
2. Primary motor area controls highly skilled movements of opposite half of the body.
3. Supplementary motor area programmly the sequential motor function.
4. Lesion causes unable to perform motor function. Loss of coordination in the movement of 2 limbs. Lesion of primary motor and supplementary motor area result in spastic paralysis with exaggerated deep tendon reflex.
5. Lesion of motor speech area 44 & 45 produces inability to speak what person think – motor aphasia.
7. Frontal eye field area controls the conjugate movement of eye ball present in posterior part of middle frontal gyrus.
8. Prefrontal controls depth of feeling and understanding.
9. Sensory area is granular cortex. Sensory area 1,2,3, Secondary sensory area & Sensory associated area are present.
10. Primary visual area
11. 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.

**EFFECT OF LESION IN SUPERIOR DIVISION:**
1. Motor aphasia lesion of Brocas area.
2. Loss of conjugate movement of eyeball due to lesion in frontal eye field.
3. Contra lateral hemiplegia due to lesion in motor area.
4. Except the leg area for sensory cortex.
5. Aterognesis due to sensory association cortex.

**EFFECT OF LESION IN INFERIOR DIVISION:**
1. Auditory loss (partial) and auditory receptive and associative cortex due to lesion of anterior temporal and posterior temporal branch.
2. Wernicks aphasia auditory and visual aphasia is due to lesion of anterior temporal and posterior temporal branch.

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**CIRCULUS ARTERIOSUS OR CIRCLE OF WILLIS:**
- Anterior choroidal artery
- Posterior communicating artery
- Posterior inferior cerebellar artery
- Anterior inferior cerebellar artery
- Posterior cerebral artery
- Internal carotid artery
- Anterior communicating artery
- Posterior communicating artery
- Anterior cerebral artery
- Middle cerebral artery
- Posterior cerebral artery

**M1 SEGMENT**

**METHOD OF STUDY**

**BLOOD SUPPLY OF FUNCTIONAL AREAS OF SUPERO LATERAL SURFACE OF CEREBRAL CORTEX OF BRAIN.**

**KEYWORDS:**
- Blood supply to supero lateral surface of cerebral cortex
- Content of submerged cortex
- Content of Insula
- Cortical branch of cerebral cortex
- Largest terminal branch of internal carotid artery
2. Number
3. Gyrus to which enter any other artery to the same gyrus if so size of lumen of both.
4. Size of lumen
5. Its comparison with other terminal branches for all functional areas.
6. Termination of M1 segment and number of division are noted.
7. Artery supply to the Broca’s area.
8. Artery supply to the frontal eye field.
9. Artery to motor area.
10. Artery to SensorY area.
11. Artery to wernick’s area.
12. Artery supply to the sensory association cortex
14. Central branch or the lenticulo striate branch.

OBSERVATION:
1. Orbito frontal shows dichotomous pattern which has not been observed in any specimen & this division has not been reported previously.
2. One functional area supplied by more than one artery
   • Orbito frontal supplying motor speech area in addition to frontopolar. So more supply to the brocas area.
   • Three divisions are noted.
   • Orbito frontal supplies brocas and frontopolar is connected with orbito frontal.
   • This denotes liberal blood supply to the functional area.

Superior division 1:
1. Superior division of angular artery supplies visual association cortex & posterior parietal which supply sensory association cortex.

Superior division 2:
1. There is liberal blood supply to motor and sensory area by the four connections of pre rolandic and rolandic branch.
2. Angular artery supplied visual association cortex and connected with posterior temporal branch by the superior division is connected with inferior division.

Inter Connections:
1. Angular artery is connected with pre rolandic artery.
2. 2 connection between frontopolar and prefrontal branch.
3. There is communication between the angular artery and pre rolandic branch.
4. In all cases size of lumen is same from origin to Termination.
5. There is free communication between 6 branches of superior division. All lumen size are same of 3 mm.
6. There is connection between the posterior temporal and angular artery. Lumen size are same as 3 mm.
7. There is connection between anterior and posterior parietal branch.
8. In three divisions first branch is acute . Second is right angle and third is acute angle of origin.
9. M1 segment length normal 14-16 mm and has 2 divisions.

CONCLUSION:
1. Superior division infarcts lead to contralateral deficits with involvement of upper extremity.
2. Inferior division infarcts leads to Wernicke’s aphasia.
3. Main trunk occlusion of either side yields contralateral hemiplegia.
4. Trunk occlusion causes global aphasia.
5. Partial hemiparesis occurs in middle cerebral artery infarcts.
6. Hemianopsia occurs in middle cerebral artery infarct.
7. Middle cerebral artery stroke indicate a larger lesion affecting deep and superficial branch.
8. Inter corrections show liberal blood supply to functional lobes.
9. By the liberal blood supply infaction is minimal.
10. Three division of middle cerebral artery length is 30 mm.
11. There are liberal blood supply to functional lobes lume size is same.

REFERENCE:
2. Damage to the left precentral gyrus is associated with apraxia of speech in acute stroke R Itabashi, Y Nishio, Y Kataoka, Y Yazawa, EFurui – Annals of .2012.