Basilar Artery Stroke Assessment

Basilar artery stroke can have devastating consequences as this artery supplies the most crucial brainstem structures, namely the medulla, pons, and midbrain. Disruption of the lateral corticospinal and corticobulbar tracts causes patients to develop complete quadriplegia (paralysis of 4 extremities), loss of facial movements, and loss of horizontal eye movements. A feared complication of basilar artery stroke is "Locked-in Syndrome" wherein patients have total body paralysis, however vertical gaze and consciousness are preserved.



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Characteristics

Brainstem Structures

Brain-stem

The basilar artery is formed from the vertebral arteries near the junction of the medulla and pons in the brainstem. It courses over the ventral surface of the pons giving off several branches before dividing into bilateral posterior cerebral arteries near the junction of the pons and midbrain. For this anatomical reason, basilar artery strokes can affect tracts, cranial nerve nuclei, and other structures in all brainstem components (medulla, pons, midbrain).

Lateral Corticospinal and Corticobulbar Tracts

Ladders Cortez-spine and Cortez-bulb

The lateral corticospinal and corticobulbar tracts can be affected by basilar artery stroke. These tracts contain motor neurons which control muscle activity. This can result in quadriplegia (paralysis of all four limbs), and loss of facial, mouth, and/or tongue movements.

Clinical Findings

Locked-in Syndrome

Lock

Locked-in syndrome (pseudocoma) is a medical condition in which a patient is aware but cannot move or communicate verbally due to complete paralysis of all voluntary muscles in the body except those responsible for vertical eye movements and blinking. This syndrome can be caused by basilar artery stroke.

Motor Dysfunction

Broken Motorized-wheelchair

Lateral corticospinal and corticobulbar tract involvement can result in quadriplegia (paralysis of all four limbs), loss of facial, mouth, and tongue movements.

Preserved Vertical Eye Movements

Cyclops with Up-Down Eye

The involvement of cranial nerve nuclei of the eyes and paramedian pontine reticular formation results in loss of horizontal, but not vertical, eye movements. Patients often use vertical eye movements to communicate. Horizontal gaze nuclei (e.g. CN VI) are located in the pons while vertical gaze nuclei (e.g. CN III) are located in the midbrain so are often spared.

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