ANATOMICAL VARIATIONS INFLUENCE STROKE PROGNOSIS AFTER THROMBECTOMY

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BACKGROUND:

Changes in the normal anatomy of the circle of Willis may favour cerebrovascular disorders but how these conditions may influence stroke prognosis has not yet been studied. We aimed to analyse the influence of vessel anatomy on recanalization results and functional recovery in patients with stroke due to large vessel occlusion.

MATERIAL AND METHODS:

We performed a retrospective study of consecutive patients with middle cerebral artery (MCA) stroke undergoing endovascular treatment at our center.

Anatomical variations of the circle of Willis were identified on baseline computed tomographic angiography.

Posterior communicating artery (PCoA) hypoplasia

Fetal origin of the posterior cerebral artery (fPCA)

We assessed the dominance of both superior and inferior main divisions of the MCA and the M1/M2 angle (angle between distal M1 segment and proximal M2 segment) by digital subtraction angiography.

We correlated these variables with radiological and clinical outcomes.

RESULTS:

N=190

Most common site of occlusion	Distal M1 segment (41.8%)
Time to recanalization (mean)	287.27 min (SD: 137.1)
Baseline ASPECTS (median)	8 (IQR: 7)
Christoforidis collateral score on CTASI (median)	1 (IQR: 7)
Primary thrombectomy	50.5%
Procedure duration (mean)	46 min (SD: 33.5)
Successful recanalization (TICI >2a)	91.7%
Infarct volume at 24 hours (mean)	29 cc (SD: 62.2)
3-month mRS 0-2	60.8%

The fPCA was associated with smaller infarct volume on follow-up CT at 24 hours ($p < 0.05$) (after adjustment for baseline CT and collateral circulation status).

After adjustment for baseline ASPECTS, time from symptoms onset to recanalization and site of occlusion, the fPCA was associated with better 3-month mRS ($p < 0.05$).

Patients with hypoplastic P1 segments were more likely to have a better leptomeningeal collateral circulation ($p < 0.05$).

PCOA HYPOPLASIA

INFERIOR TRUNK DOMINANT

FETAL PCA

M1/M2 ANGLE

In those patients with M1/M2 angles greater than 130° there was a trend towards fewer number of stent-retriever passes needed to complete recanalization ($p = 0.09$).

Median number of passes

CONCLUSIONS

In our study, fPCA was found to be an independent predictor of better radiological and functional outcomes in patients with acute stroke. Other anatomical variations did not significantly influence the results of thrombectomy. We have not found any similar references in literature.