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Poster Session 1

Predictors of stroke after carotid endarterectomy

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Goal

To investigate factors leading to the occurrence of stroke after carotid enderaterectomy.

Methods

N=206 patients were subject to a longitudinal study (median observation time 108 months, max 141 month, min 36 months). During the observation 33 patients had post-surgery stroke, and 37 died, including 21 having stroke before death. The occurrence of post-surgery stroke was modeled using Cox survival model, both in the traditional form (W. N. Venables and B. D. Ripley. Modern Applied Statistics with S. Springer, 2010) and the Bayesian one (Zaixiang Tanget al. BMC Bioinformatics, 20(1):94, 2019). The model used the following parameters: age, gender, employment, marital status, education, alcohol use, smoking, presence of angina and diabetes, initial diagnosis, taking of statins and aspirin, patient's compliance, regular visits to neurologists and cardiologists, Barthel, FIM and MMSE scores, anxiety and depression, and cholesterol ratio.

Results

The most important predictors are shown in Table 1. Both models chose age and Barthel score as the most predictive parameters. Traditional model added MMSE and retirement as predictors. Presumably the work-related stress makes the prognosis better for retired patients. This finding underscores the importance of non-medical factors in post-surgery prognosis. The study confirms the value of Barthel index for the prognosis: the more independent is the patient in the daily life, the better is the expected outcome.

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Poster Session 1

Novel canine stroke models using reversible MCA-occlusion alone vs RMCAO plus permanent ACA-occlusion to determine reproducibility and its potential use for translation stroke therapies

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Background

The Stroke Treatment Academic Industry Roundtable (STAIR) is in the need of translation stroke models to test novel stroke therapies. Our pilot study established a novel endovascular MCAo/ACAo model, that can mimic a stroke in humans.

Methods

A total of nine mongrel-hound (n=5 rMCAo, n=4 rMCAo + pACAo, age 12-36 months; BW 22±5 kg), underwent trans-femoral endovascular-catheterization of the MCA-alone or MCA+ACA with a single soft platinum-detachable coil embolization (2x8 mm for MCA, 2x4 mm for ACA). Total occlusion-time MCA: 60 min. MCA-recanalization established by coil-retraction. The dogs were survived for 30 days. Weekly neurological-scoring were performed. Brain-MR-MRA at 2^{nd}, 15^{th}, 30^{th}-days for stroke-volumes and Diffusion Tensor imaging analysis of the CST.

Results

Successful MCAo-recanalization was achieved in 8/9, 1-dog from the rMCAo/ACA-group died. We achieved reproducible stroke volume and significant neuro deficits at rMCAo+pACAo group, not the case for rMCAo alone. Avg-stroke vol for group rMCAo/pACAo:15.2 cc(+/-2.9 cc) and rMCAo: 4.5cc (+/-5.5 cc), We observed 88,8% feasibility on achieving rMCAo/ACAo. DTT/CST correlated with the stroke vol and neuro/deficits.

Conclusion

In our prior rMCAo model we were not able to achieved significant reproducibility in the stroke vol, also the time of rMCAo needed to achieved a neuro-deficit avg120 min. With this new occlusion model, a 60 min is enough to achieved a stroke vol size that reproduce a neuro-deficit that can be correlated with the one seen in humans. We report

Table 1: Hazard parameters

Parameter	β	p	Hazard multiplier 95% conf. interval	
			Lower	Upper
TRADITIONAL MODEL				
Age	0.268	1.9×10^{-5}	1.16	1.48
Barthel score	−0.219	1.4×10^{-3}	0.70	0.92
MMSE score	0.785	2.2×10^{-2}	1.12	4.29
Retirement	−1.886	3.4×10^{-2}	0.03	0.86
BAYESIAN MODEL				
Age	0.173	1.3×10^{-4}	1.09	1.30
Barthel score	−0.141	7.3×10^{-3}	0.78	0.96