

Somatosensory evoked potentials in carotid artery stenting: Effectiveness in ascertaining cerebral ischemic events

頸動脈ステント留置術における体性感覚誘発電位測定： 大脳半球虚血の検知に対する有用性

氏名：Rupendra Bahadur **Adhikari** ルペンドラ・バハドゥール・アディカリ

所属：広島大学 大学院医歯薬保健学研究院 脳神経外科学

Abstract

Purpose

SEP has been used in various endovascular procedures and carotid endarterectomy but no literature deals with its utility in carotid artery stenting (CAS) exclusively. The purpose of this study was to evaluate the efficacy of somatosensory evoked potential (SEP) in ascertaining cerebral ischemic events during CAS.

Materials & Methods

We conducted a prospective study in 35 CAS procedures in 31 patients during an 18 months period. All except two cases of near occlusion underwent stenting by dual protection (simultaneous flow reversal and distal filter) combined with blood aspiration. SEP was generated by stimulating median and/or tibial nerves and recorded by scalp electrodes.

Results

During aspiration phase post dilation, 7 cases (20%) exhibited SEP changes with mean duration of 11.3 ± 8.5 min (range: 3-25 min), 3 of whom later developed minor stroke/transient ischemic attack. Diffusion-weighted imaging showed new lesions in 10 cases (28.6%). Change in SEP exhibited mean sensitivity of 100% (95% CI, 0.29-1.0) and specificity of 88% (95% CI, 0.71-0.96) in predicting clinical stroke post CAS. Intra-procedural SEP change was predictive of post-procedural complications ($p=0.005$, Fischer's). Longer span of SEP change was positively correlated with complications ($p=0.032$, Mann-Whitney).

Conclusion

Intra-procedural SEP changes are highly sensitive in predicting neurological outcome following CAS. Chances of complications are increased with prolongation of such changes. SEP allows for prompt intra-procedural ischemia preventative measures and stratification to pursue an aggressive peri-procedural protocol for high risk patients to mitigate neurological deficits.