Timing of Complications after Carotid Stenting

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Purpose

Endoluminal treatment of carotid stenosis is gaining increasing popularity due to the perception that it is less invasive.[1,2] However, outcome of carotid angioplasty-stenting (CAS) should be verified in each center before considering CAS a valid alternative to carotid endarterectomy.[3] The aim of this study was to analyze the incidence and timing of neurological complications during CAS procedures.

Methods

During a 48-month period (May 2001–May 2005), 417 CAS were performed in a single institution and entered prospectively into a registry.

Indications for CAS were: high-risk patients, recurrent carotid disease, and irradiated neck. All CASs were performed under local anaesthesia in operating room using cerebral protection devices.[4] During the CAS procedure, five major time frames were considered: phase 1 "catheterization phase," including the passage of the aortic arch, cannulation of the target vessel and introduction of guiding catheter or sheath; phase 2 "crossing the stenosis phase," including the placement of cerebral protection device (CPD); phase 3 "stent-ballooning phase" including predilatation when indicated, stent implantation, postdilatation, and recovery of the protection system; phase 4 "early postinterventional phase," including the first 24 hours after leaving the catheterization table. After CAS procedures, we also considered a phase 5 "late post-interventional phase," including time from first postoperative day to 30 days.

Results

Symptomatic stenosis were 23%; severe coronary artery disease was present in 16% of the patients. Inability to complete CAS occurred in 18 patients (4.3%). These required conversion to carotid endarterectomy. At 30 days, nine major strokes (2.1%), two of which were fatal, occurred in the study cohort. Four strokes occurred during phase 1, four in phase 2, and one in phase 3. No major strokes were registered after leaving the OR (phases 4 and 5). All but one stroke were ischemic. Five strokes were ipsilateral, whereas three were contralateral and one vertebrobasilar.

Conclusions

Our experience showed that CAS is feasible (95.6% technical success) with acceptable major neurologic complications. All but one major neurologic event occurred before crossing the lesion (phases 1 and 2). Cerebral embolism represents the most important risk of epiaortic catetherism: this is a limiting factor for the procedure. The use of cerebral protection devices probably will not reduce the rate of ischemic complications to zero since they cannot reduce the risks of phases 1 and 2 of CAS. Therefore, proper material choice and patient selection are crucial to improve neurologic outcome after CAS.

Accurate selection of cases, good technique and "knowing when to quit" are essential criteria to ensure success and reduce the procedure's risk.

Ongoing trials will provide a final answer to questions about safety and late efficacy of CAS.

References

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