



ANESTHESIA MANAGEMENT IN THE SURGICAL TREATMENT OF CAROTID ARTERY DISEASE

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INTRODUCTION

Among cardiovascular diseases, carotid artery disease is the most treated after coronary artery disease (1). Carotid artery stenosis is one of the important causes of mortality and morbidity related to cardiovascular diseases (1,2).

Atherosclerosis is the main cause of occlusive disease in carotid artery disease. It is mostly seen at the bifurcation of the common carotid artery and often extends to the internal and external carotid arteries. Complete occlusion is rare (3). The main problem in carotid artery disease is plaque embolism, which leads to a cerebrovascular disease or a transient ischemic attack. Hypoperfusion may also develop due to the stenosis caused by atheroma. All these can be considered as sources of cerebrovascular sequelae caused by carotid artery diseases. Hypoperfusion may be responsible for 10% of these sequelae (4). Stroke due to carotid artery disease ranks second among the causes of death in patients with cardiovascular diseases (5). The risk factors for carotid artery disease include hypertension, diabetes mellitus, advanced age, smoking, high blood lipid levels, left main coronary artery disease, and peripheral artery disease.

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REFERENCES

1. Ugurlucan M, Akay HT, Erdinc I, Oztas DM, Conkbayir C, Aslim E, et al. Anticoagulation Strategy in Patients with Atrial Fibrillation after Carotid Endarterectomy. *Acta Chir Belg.* 2019;119(4):209-16.
2. Ugurlucan M, Filik ME, Caglar IM, Zencirci E, Sayin OA, Aydiner O, et al. Carotid endarterectomy using a “homeconstructed” shunt for patients intolerant to crossclamping. *Surg Today.* 2015;45(3):284-9.
3. Imparato AM, Riles TS, Gorstein F. The carotid bifurcation plaque: pathologic findings associated with cerebral ischemia. *Stroke.* 1979; 10(3):238-45.
4. Bladin CF, Chambers BR. Frequency and pathogenesis of hemodynamic stroke. *Stroke.* 1994;25(11):2179-82.
5. Lomivorotov VV, Shmyrev VA, Nepomniashchikh VA. Regional versus general anesthesia for carotid endarterectomy: do we need another randomized trial? *J Cardiothorac Vasc Anesth.* 2019;33 (4):943-4.
6. Bilen B, Sener LT, Albeniz I, Sezen M, Unlu MB, Ugurlucan M. Determination of Ultrastructural Properties of Human Carotid Atherosclerotic Plaques by Scanning Acoustic Microscopy, Micro-Computer Tomography, Scanning Electron Microscopy and Energy Dispersive X-Ray Spectroscopy. *Sci Rep.* 2019;9(1):679.
7. Grieff AN, Dombrovskiy V, Beckerman W, Ventarola D, Truong H, Huntress L et al. Regional anesthesia is associated with cranial nerve injury in carotid endarterectomy. *Ann Vasc Surg* 2020 pii: S0890-5096(20)30010-8
8. Vieira Andrade JD, Rocha-Neves JP, Macedo JP, Dias Neto MF. Onset of Neurological Deficit During Carotid Clamping With Carotid Endarterectomy Under Regional Anesthesia Is Not a Predictor of Carotid Restenosis. *Ann Vasc Surg.* 2019;61:193-202.
9. Beyaz MO, Ugurlucan M, Oztas DM, Meric M, Conkbayir C, Agacfidan A, et al. Evaluation of the relationship between plaque formation leading to symptomatic carotid artery stenosis and cytomegalovirus by investigating the virus DNA. *Arch Med Sci Atheroscler Dis.* 2019;4:e19-e24.
10. Result of randomized controlled trial of carotid endarterectomy for asymptomatic carotid stenosis. Mayo Asymptomatic Carotid Endarterectomy Study Group. *Mato Clin Proc.* 1992;67:513-8.
11. Kirstin M. Erickson and Daniel J. Cole. Review of developments in anesthesia for carotid endarterectomy. *Current Opinion in Anesthesiology* 2005;18:466-70.
12. Babikian VI, Cantelmo NL. Cerebrovascular Monitoring During Carotid Endarterectomy. *Stroke.* 2000;31:1799-1801.
13. Korfalı, G.(2009). Aort Cerrahisinde Anestezi. Gülsen Korfalı (Ed.) Uludağ Üniversitesi Tıp Fakültesi Anesteziyoloji ve Rean. Anabilim Dalı Anestezi Protokolleri (3. Baskı, s.149). Logos yayıncılık.
14. Kalko Y, Kafalı E, Aydin U, Kafa U, Kosker T, Basaran M, et al. Surgery of the carotid artery: local anaesthesia versus general anaesthesia. *Acta Chir Belg.* 2007;107(1):53-7.

15. Umbrain V. Isoflurane, desflurane and sevoflurane for carotid endarterectomy. *Anesthesia*, 2000;55:1052-57.
16. Godet G, Reina M, Raux M, Amour j, De Gastro V.and Coriat P. Anesthesia for carotid endarterectomy:comparison of hypnotic and opioid based techniques. *British Journal of Anesthesia*. 2004; 92(3):329-34.
17. Bevilacqua S, Romagnoli S, Ciappi F, Lazzeri C, Gelsomino S, Pratesi C, Gensini GE. Anesthesia for carotid endarterectomy: the third option. Patient comperation during general anesthesia .*Anesth Analg*. 2009;108(6):1929-36.
18. Spencer PC, Elsemann B: Technique of carotid endarterectomy *Surg Gynecol Obstet*. 1962;115:115-7.
19. Karasu A, Kuşcu DY, Bakaç G, Oflluoğlu E, Akkoyun N, Yalciner B, Dayan C, Bahar S, Kiriş T, Uye M, Toplamoğlu H. Carotid endarterectomy with regional anesthesia: an audit of 71 cases. *Turk Neurosurg*. 2009;19(1):21-8.
20. Öztaş DM, Uğurlucan M, Sayın ÖA, Ulukan MÖ, Erdiñ İ, Beyaz MO et al. Servikal Blok Altında Karotis Endarterektomi Operasyonu Sonuçlarımız. *İzmir Eğitim ve Araştırma Hastanesi Tıp Dergisi* 2020;24 (4):315-321
21. Malik OS, Brovman EY, Urman RD. The use of regional or local anesthesia for carotid endarterectomies may reduce blood loss and pulmonary complications. *J Cardiothorac Vasc Anesth*. 2019;33(4): 935-42.
22. Lomivorotov VV, Shmyrev VA, Nepomniashchikh VA. Regional versus general anesthesia for carotid endarterectomy: do we need another randomized trial? *J Cardiothorac Vasc Anesth*. 2019;33(4): 943-4.
23. Dakour-Aridi H, Gaber MG, Khalid M, Patterson R, Malas MB. Examination of the interaction between method of anesthesia and shunting with carotid endarterectomy. *J Vasc Surg*. 2020;71(6):1964- 71.
24. DakourAridi H, Paracha N, Nejm B, Locham S, Malas MB. Anesthetic type and hospital outcomes after carotid endarterectomy from the Vascular Quality Initiative database. *J Vasc Surg*. 2018;67 (5):1419-28.
25. Kim JW, Huh U, Song S, Sung SM, Hong JM, Cho A.Outcomes of carotid endarterectomy according to the anesthetic method: general versus regional anesthesia.*Korean J Thorac Cardiovasc Surg*. 2019; 52(6):392-9.