

(CASE REPORT)



## Carotid endarterectomy in a patient with recurrent transient ischemic attacks and burdened neurological history: A decision-making dilemma: Case report

Ihor I. Kobza <sup>1</sup>, Vasyl V. Pelekh <sup>2,\*</sup> and Yuliya S. Mota <sup>1</sup>

<sup>1</sup> Department of Surgery No.2, Danylo Halytsky Lviv National Medical University, Lviv, Ukraine.

<sup>2</sup> Department of Vascular Surgery, Lviv Regional Clinical Hospital, Lviv, Ukraine.

World Journal of Biology Pharmacy and Health Sciences, 2024, 17(03), 268–272

Publication history: Received on 12 February 2024; revised on 19 March 2024; accepted on 21 March 2024

Article DOI: <https://doi.org/10.30574/wjbphs.2024.17.3.0141>

### Abstract

**Introduction:** in symptomatic patients with carotid artery disease (CAD), carotid endarterectomy (CEA) reduces the risk of major stroke and is highly beneficial in patients with 70% to 99% stenosis. However, patients with burdened neurological history, risk factors, and relative contraindications for surgery require thoughtful decision-making.

**Case presentation:** 51-year-old male patient with a previous ischemic stroke (mRS 3) with an area of infarction that exceeds one-third of the right middle cerebral artery, who had ipsilateral carotid artery critical stenosis and contralateral near-occlusion and suffered from recurrent ipsilateral transient ischemic attacks (TIA) despite being on medical treatment. The patient underwent CEA and was discharged on postoperative day 5 with partial improvement of neurological deficit. Follow-up on postoperative day 30 was unremarkable, after which neurological improvement occurred, and the patient was successfully discharged.

**Conclusion:** It is possible to perform CEA in symptomatic patients with significant neurological deficits and brain lesions if conservative treatment is ineffective and there are factors indicating the necessity for surgical intervention.

**Keywords:** Case report; Carotid endarterectomy; Stroke; Decision-making; Neurological deficits.

### 1. Introduction

Annually, 1.12 million people suffer from ischemic stroke and its consequences, it is the second most frequent cause of death after coronary artery disease, and this number is expected to increase by 27% by 2047 [1]. Atherosclerotic lesions in the extracranial sections of the internal carotid artery (ICA) contribute to more than 50% of strokes [2]. Carotid endarterectomy (CEA) has proven efficacy in reducing the long-term risk of disabling strokes in symptomatic patients with stenosis of 70% or more [3,4]. However, in cases marked by a burdened neurological history, risk factors, and relative contraindications for surgery, the decision-making process becomes intricate and necessitates careful consideration of individualized patient characteristics.

Despite the clear guidelines surrounding CEA, the decision-making process becomes intricate in patients presenting with a burdened neurological history, associated risk factors, and relative contraindications for surgery. These complexities necessitate a thoughtful and individualized approach to determine the optimal course of intervention.

This case report presents a unique scenario involving a 51-year-old male patient with a history of recurrent transient ischemic attacks (TIA) and a previous stroke, classified with an mRS of 3. The case showcases the challenges posed by ipsilateral carotid artery critical stenosis and contralateral near-occlusion. Through a detailed exploration of the

\* Corresponding author: Vasyl Pelekh

decision-making process, surgical intervention, and postoperative outcomes, we aim to contribute insights into the feasibility and benefits of CEA in symptomatic patients with significant neurological deficits and complex brain lesions

---

## 2. Material and methods

The features of clinical course, diagnosis and treatment of symptomatic carotid artery stenosis in neurologically burdened 51-years-old male patient.

---

## 3. Case presentation

We describe the case of a 51-year-old male smoker with hypertension who was referred to a vascular surgeon with symptomatic right ICA 80% stenosis caused by circular irregular plaque and asymptomatic contralateral ICA near-occlusion according to on Duplex ultrasound.

8 months prior, the patient sustained a large ischemic stroke (Magnetic resonance angiography (MRA) of the brain showed a lesion that involves frontoparietal and occipitotemporal regions in the area of right middle and posterior cerebral arteries) mRS 3 with right-sided hemiparesis and was treated conservatively without thrombolysis in district hospital with further discharge and prescription of oral aspirin 100 mg/day and atorvastatin 20 mg/day.



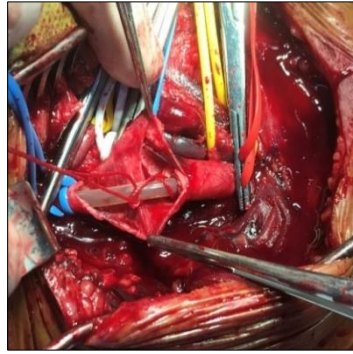
**Figure 1** The area of lesion in the right hemisphere of the brain

The patient had undergone physical rehabilitation but in 6 months sustained a generalized seizure episode with concomitant right-sided hemiparesis, was hospitalized in the district hospital, and discharged after two weeks of conservative treatment with partial resolution of neurologic deficit, also lamotrigine 50 mg/day was additionally prescribed.

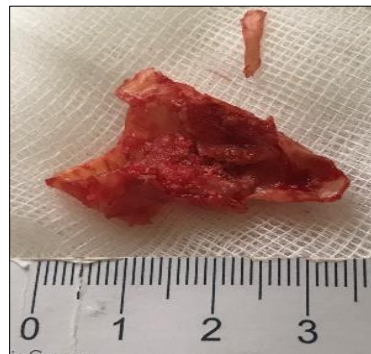
2 months after a patient sustained TIA and was referred to a vascular surgeon. Given the high-risk nature of his presentation, the patient was informed of all the risks and benefits associated with any surgical intervention. Under local anesthesia carotid endarterectomy with shunting and primary closure of arteriotomy.



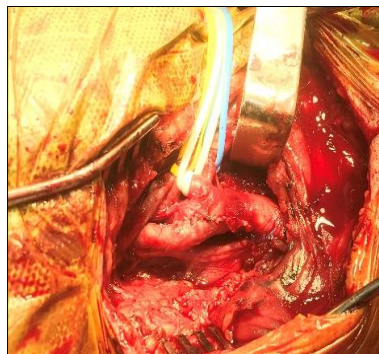
**Figure 2** Arteriotomy after carotid bifurcation dissection



**Figure 3** Shunting from common to internal carotid artery



**Figure 4** Deleted atherosclerotic plaque



**Figure 5** Closure of arteriotomy

In the postoperative period patient received triflusal 600 mg/day and cilostazol 100 mg/day as dual antiplatelet therapy and also prophylactic antibiotics and pain relief medicines. The patient was discharged on postoperative day 5 with partial improvement of neurological deficit. Follow-up on postoperative day 30 was unremarkable.

#### **4. Discussion**

Carotid endarterectomy (CEA) stands as a widely accepted intervention for significant carotid stenosis. Current data underscore its efficacy in reducing the long-term risk of disabling strokes, particularly in symptomatic patients with stenosis exceeding 70% [3,4]. Besides that, CEA has advantages over carotid artery stenting (CAS) [5]. However, the case of our 51-year-old patient, presenting with a history of recurrent ipsilateral transient ischemic attacks (TIA) and a previous stroke with substantial brain involvement, poses unique challenges. Clear indications and contraindications exist, but the intricate interplay of factors such as neurological history, risk factors for surgery, and extensive atherosclerotic carotid artery disease complicates decision-making.

Our patient exhibited critical stenosis of the right ICA, near-occlusion of the left artery, and persistent symptoms despite medical treatment. Traditional contraindications, such as a disabling stroke or extensive infarct area, were present [2,7]. However, the urgency of the situation, coupled with factors indicating the necessity for surgical intervention, prompted a thorough discussion of the risks and benefits. This case underscores the nuanced decision-making process, emphasizing the importance of individualized approaches in scenarios where standard criteria may not suffice.

The European Society for Vascular Surgery (ESVS) guidelines highlight the role of CEA in reducing the long-term risk of disabling strokes in patients with stenosis greater than 70% [2]. Moreover, the North American Symptomatic Carotid Endarterectomy Trial Collaborators demonstrated the beneficial effects of CEA in symptomatic patients with high-grade carotid stenosis[6]. AbuRahma et al. provide clinical practice guidelines for the management of extracranial cerebrovascular disease, contributing valuable insights into the decision-making process for carotid artery interventions [7].

In our case, the patient exhibited critical stenosis of the right ICA, near-occlusion of the left artery, and persistent symptoms despite medical treatment, which also inclined to perform the operation [8]. Traditional contraindications were present [2,7], yet the urgency of the situation, coupled with factors indicating the necessity for surgical intervention, prompted a thorough discussion of the risks and benefits. This case serves as a reminder that, in certain contexts, surgical interventions can be warranted, demanding a thoughtful and individualized approach guided by both clinical expertise and evidence from the literature.

---

## 5. Conclusion

In conclusion, this case illuminates the nuanced decision-making required in the management of carotid artery disease (CAD) in patients with a burdened neurological history and relative contraindications for surgery.

While conservative treatments remain essential in CAD, this case highlights the pivotal role of CEA when conservative measures prove ineffective. The individualized approach, considering the urgency of the patient's situation, critical stenosis, and near-occlusion, exemplifies the necessity for surgical intervention. Importantly, the postoperative neurological improvement and successful discharge signify not only the preventive aspects of CEA but also its rehabilitative potential in enhancing the patient's overall quality of life.

As we navigate the complexities of decision-making in high-risk patients, this case serves as a valuable reminder of the importance of a thoughtful, multidisciplinary approach. The positive outcomes observed contribute to the growing body of evidence supporting the feasibility of CEA in patients with significant neurological deficits and complex brain lesions.

Looking ahead, further research and accumulated experiences in similar cases will undoubtedly refine our understanding and guide future clinical decisions. In certain contexts, where conservative therapies falter, surgical interventions like CEA can play a crucial role in achieving optimal patient outcomes.

---

## Compliance with ethical standards

### *Disclosure of conflict of interest*

No conflict of interest to be disclosed.

### *Statement of informed consent*

The authors declare that there is no conflict of interest in conducting scientific research and preparing this article.

### *Funding information*

The authors guarantee that they have not received any remuneration in any form that could influence the results of the work.

---

## References

- [1] GBD 2019 Stroke Collaborators. Global, regional, and national burden of stroke and its risk factors, 1990-2019: a systematic analysis for the Global Burden of Disease Study 2019. *Lancet Neurol.* 2021 Oct;20(10):795-820. doi: 10.1016/S1474-4422(21)00252-0. Epub 2021 Sep 3. PMID: 34487721; PMCID: PMC8443449.

- [2] Naylor A.R, Rantner B, Ancetti S, de Borst G.J, de Carlo M, Halliday A, et al. European Society for Vascular Surgery (ESVS) 2023 Clinical Practice Guidelines on the Management of Atherosclerotic Carotid and Vertebral Artery Disease. *Eur J Vasc Endovasc Surg.* 2023; 65:
- [3] Bonati LH, Kakkos S, Berkefeld J, de Borst GJ, Bulbulia R, Halliday A, van Herzeele I, Koncar I, McCabe DJ, Lal A, Ricco JB, Ringleb P, Taylor-Rowan M, Eckstein HH. European Stroke Organisation guideline on endarterectomy and stenting for carotid artery stenosis. *Eur Stroke J.* 2021 Jun;6(2):I-XLVII. doi: 10.1177/23969873211012121. Epub 2021 May 11. PMID: 34414302; PMCID: PMC8370069.
- [4] Rerkasem A, Orrapin S, Howard DP, Rerkasem K. Carotid endarterectomy for symptomatic carotid stenosis. *Cochrane Database Syst Rev.* 2020 Sep 12;9(9):CD001081. doi: 10.1002/14651858.CD001081.pub4. PMID: 32918282; PMCID: PMC8536099.
- [5] Müller MD, Lyrer P, Brown MM, Bonati LH. Carotid artery stenting versus endarterectomy for treatment of carotid artery stenosis. *Cochrane Database Syst Rev.* 2020 Feb 25;2(2):CD000515. doi: 10.1002/14651858.CD000515.pub5. PMID: 32096559; PMCID: PMC7041119.
- [6] North American Symptomatic Carotid Endarterectomy Trial Collaborators; Barnett HJM, Taylor DW, Haynes RB, Sackett DL, Peerless SJ, Ferguson GG, Fox AJ, Rankin RN, Hachinski VC, Wiebers DO, Eliasziw M. Beneficial effect of carotid endarterectomy in symptomatic patients with high-grade carotid stenosis. *N Engl J Med.* 1991 Aug 15;325(7):445-53. doi: 10.1056/NEJM199108153250701. PMID: 1852179.
- [7] AbuRahma AF, Avgerinos ED, Chang RW, Darling RC 3rd, Duncan AA, Forbes TL, Malas MB, Murad MH, Perler BA, Powell RJ, Rockman CB, Zhou W. Society for Vascular Surgery clinical practice guidelines for management of extracranial cerebrovascular disease. *J Vasc Surg.* 2022 Jan;75(1S):4S-22S. doi: 10.1016/j.jvs.2021.04.073. Epub 2021 Jun 19. PMID: 34153348.
- [8] Powers WJ, Rabinstein AA, Ackerson T, Adeoye OM, Bambakidis NC, Becker K, Biller J, Brown M, Demaerschalk BM, Hoh B, Jauch EC, Kidwell CS, Leslie-Mazwi TM, Ovbiagele B, Scott PA, Sheth KN, Southerland AM, Summers DV, Tirschwell DL. Guidelines for the Early Management of Patients With Acute Ischemic Stroke: 2019 Update to the 2018 Guidelines for the Early Management of Acute Ischemic Stroke: A Guideline for Healthcare Professionals From the American Heart Association/American Stroke Association. *Stroke.* 2019 Dec;50(12):e344-e418. doi: 10.1161/STR.0000000000000211. Epub 2019 Oct 30. Erratum in: *Stroke.* 2019 Dec;50(12):e440-e441. PMID: 31662037