Dissecting lesions of common carotid artery after carotid surgery: a case report

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Abstract

This case report represents rare complication of carotid surgery, iatrogenic dissection of the common carotid artery and its successful endovascular treatment. We herein report a case of 55 year-old female patient in whom carotid surgery was performed due to constant tinnitus caused by kinking of right internal carotid artery. On day 7th carotid control ultrasound was performed, according to hospital's protocol. The carotid ultrasound showed dissecting lesion of right common carotid artery in a length of three centimeters that was confirmed with computed tomography angiography of neck vessels, and dual antithrombotic therapy was initiated. One month later percutaneous angioplasty was performed with stent implantation.

Keywords: carotid kinking, carotid dissection, endovascular treatment, carotid surgery.

Sažetak:

Disecirajuće lezije zajedničke karotidne arterije nakon operacije karotide: prikaz slučaja

Ovaj prikaz slučaja predstavlja rijetku komplikaciju karotidnog kirurškog zahvata, jatrogenu disekciju zajedničke karotidne arterije i njene uspješno endovaskularno liječenje. Prikazujemo slučaj 55-godišnje pacijentice kod koje je učinjena karotidna operacija zbog stalnog tinitusa uzrokovanog uvijanjem desne unutarnje karotidne arterije. Sedmog dana učinjen je kontrolni ultrazvuk karotida, prema bolničkom protokolu. Ultrazvuk karotide pokazao je disecirajuću leziju desne zajedničke karotidne arterije u dužini od tri centimetara što je potvrđeno kompjutoriziranom tomografskom angiografijom žila vrata, a dvojna antitrombotska terapija pokrenut. Mjesec dana kasnije učinjena je perkutana angioplastika s implantacijom stenta.

Ključne riječi: karotidno presavinuće, karotidna disekcija, endovaskularno liječenje, karotidna kirurgija

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This article was submitted to RAD CASA - Medical Sciences as the original article

Conflict of Interest Statement: The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Received: 29 November 2022
Accepted: 13 December 2022
Published: 21 December 2022

Citation:
Budincevic H, Ivkosic A, Vidjak V, Pavic P. Dissecting lesions of common carotid artery after carotid surgery: a case report
RAD CASA - Medical Sciences. 553=60-61 (2022): 124-127
DOI: 10.21857/mjrl3uglr9

INTRODUCTION

Carotid artery dissections include two types, spontaneous, which occurs without cause and others usually caused as a result of blunt or penetrating trauma (1). Carotid surgery is commonly performed in patients with symptomatic high grade carotid stenosis, while rarely in uncommon disorders affecting carotid arteries such as kinking and coiling of internal carotid artery which produce ischemic symptoms, carotid body tumor and dissection of the carotid artery (2-5).

This case report represents a potentially dangerous and rare complication of carotid surgery and the role of ultrasound in early detection of the dissecting lesion.

Case report

We herein report a case of 55 year-old female patient in whom carotid surgery was performed due to kinking of right internal carotid artery which caused constant tinnitus. The kinking of the right internal carotid artery was confirmed with computed tomography angiography (Figure 1.) and digital subtraction angiography of the neck. The patient complained of pain and palpable pulsating tumorous mass on right side of the neck, with symptoms of constant tinnitus. Her prior medical history included low back pain and gastritis, whilst six months prior to surgery the patient underwent a microdiscectomy for cervical radiculopathy (C5-C6). Carotid surgery was performed in the patient and included segmental resection of right internal carotid artery with re-anastomosis with common carotid artery. The patient did not complain of symptoms after the surgery, while previous symptoms disappeared. On day 7th carotid control ultrasound was performed, according to hospital's protocol. The carotid ultrasound showed dissecting lesion of right common carotid artery in a length of three centimeters ending at the carotid bifurcation that formed double flaps at the beginning and at the end of dissection and produced moderate hemodynamic stenosis (60%) (Figure 2.), that was confirmed with computed tomography angiography of neck vessels (Figure 3. and Figure 4.). The neurological and physical status was normal, except for the pain experienced in the neck again. For stroke prevention dual antiplatelet and antihypertensive therapy were introduced. Due to presence of symptoms, one month later percutaneous angioplasty was performed with stent implantation. The control carotid ultrasound showed stent implantation with normal hemodynamics, without any sign of dissection (Figure 5. and Figure 6.).

Figure 1. Computed tomography angiography of the neck vessels shows kinking of the right internal carotid artery

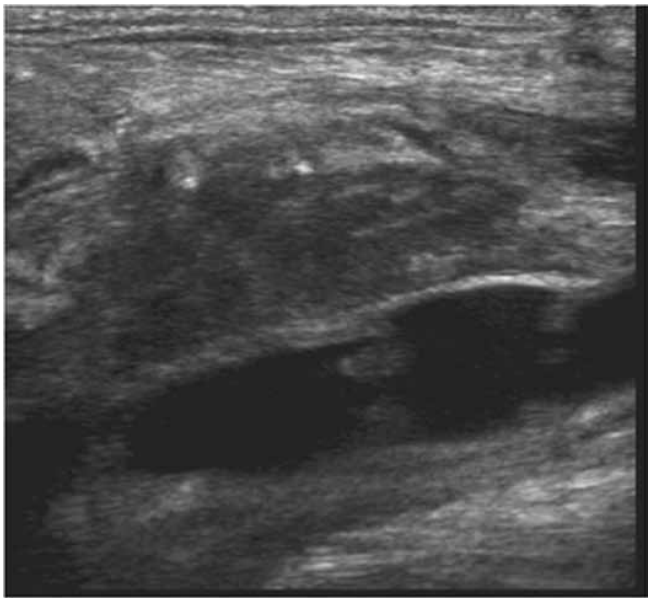

Figure 2. Carotid ultrasound shows dissecting lesions of the right common carotid artery

Discussion

Our case demonstrated a potentially dangerous and rare complication of carotid surgery and the role of ultrasound in early detection of the lesion. The proposed mechanism of the lesion was the tight clamping with Rumel tourniquet of the right common carotid artery during surgery that produced intimal tear of the common carotid artery and led to dissection. The other re-

Figure 3. Computed tomography angiography of the neck vessels after surgery shows dissecting lesions of the right common carotid artery

ported mechanism of dissecting lesion is shunt placement during surgery, the surgical technique and clamping time (6). Intimal lesions such as dissections are rarely described but they might be a important factor for the development of thromboembolic incident (6). Although the carotid irregularities are common after carotid surgery, they rarely cause re-stenosis (7). These irregularities are intimal flaps, intimal steps and dissecting lesions (8). Previous reports using ultrasound showed that in patients with carotid surgery for symptomatic high grade stenosis asymptomatic dissecting lesions of carotid arteries are 5% (6). Endovascular treatment might be indicated and it is a safe procedure (9, 10). Carotid artery abnormalities such as tortuosity, kinking and coiling are common, and it might be present in one fourth of patients refered to carotid ultrasound (11). Mumoli et al. showed that carotid kinking and coiling are prevalent in female patients (female to male ratio 4:1), and it is associated with smoking, hyperlipidemia, and ischemic heart disease (12). These finding might be acquired or congenital (2). Kinkings are usually associated with mild atherosclerotic plaques that cause different degrees of carotid stenosis (11). Symptoms which are related to tortuosity of carotid artery are neck pain, vertigo, tinnitus, and in rare cases transient ischemic attack or even stroke (11). Surgery of carotid artery is advocated in symptomatic kinking or coiling with high grade stenosis (4). Carotid surgery might be performed in other but selected symptomatic patients (3). There are reported cases with pulsatile tinnitus in which carotid surgery of kinking produced good clinical outcome (13, 14). Ballotta et al. showed that carotid surgery for symptomatic (causing cerebral ischemic symptoms) carotid kinking is superior in preventing stroke in comparison to the best medical therapy (15). Asymptomatic patients should be treated with conservative approach (3).

Figure 4. Computed tomography angiography of the neck vessels shows dissecting lesions of the right common carotid artery

Conclusion

Generally surgery of carotid abnormalities (such as kinkings) without ischemic symptoms should be avoided, except in carefully selected cases. The carotid surgery complications such as dissecting lesion might be successfully treated with percutaneous angioplasty with stent implantation. Carotid ultrasound has its place as a screening method for demonstrating these undisclosed lesions.

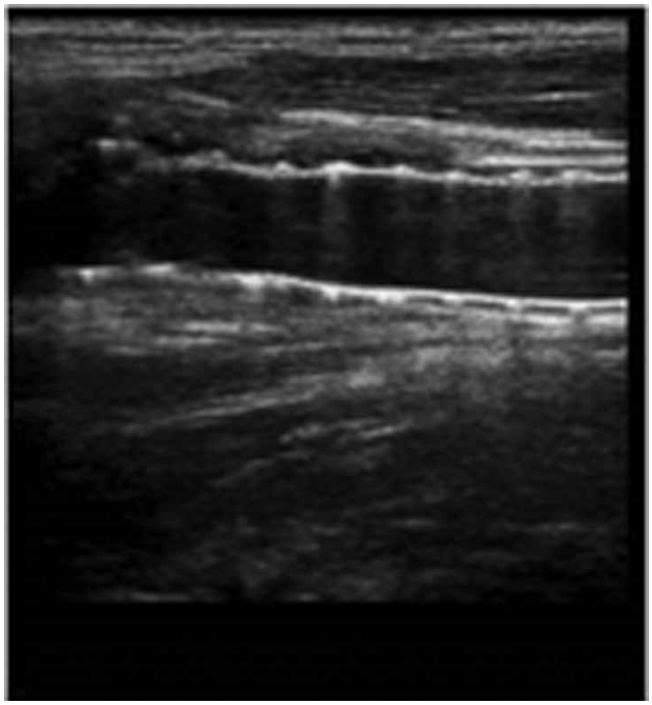

Figure 5. Carotid ultrasound shows stent placement and normal morphology of the right common carotid artery

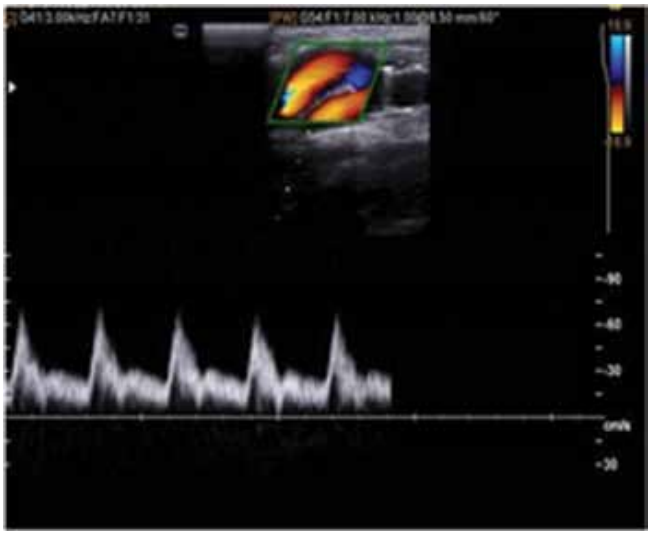

Figure 6. Carotid ultrasound shows normal hemodynamics in right internal carotid artery after endovascular treatment.

References:

1. Thanvi B, Munshi SK, Dawson SL, Robinson TG: Carotid and vertebral artery dissection syndromes. *Postgrad Med J* 2005, 81(956):383-388.
2. Ivkosic A, Trajbar T, Antolic S, Lojo N, Budincevic H, Mrsic V: [Rare disorders of extracranial carotid arteries]. *Acta Med Croatica* 2014, 68(3):307-310.
3. Radak D, Babic S, Tanaskovic S, Matic P, Sotirovic V, Stevanovic P, Jovanovic P, Gajin P: Are the carotid kinking and coiling underestimated entities? *Vojnosanit Pregl* 2012, 69(7):616-619.
4. Demarin V, Lovrencic-Huzjan A, Basic S, Basic-Kes V, Bielen I, Breitenfeld T, Brkljacic B, Cambi-Sapunar L, Jurjevic A, Kadojic D *et al*: Recommendations for the management of patients with carotid stenosis. *Acta Clin Croat* 2010, 49(1):101-118.
5. Ivkosic A, Trajbar T, Budincevic H, Antolic S, Lojo N, Oberhofer D: [Early carotid endarterectomy in symptomatic patients - our experience]. *Acta Med Croatica* 2014, 68(3):289-293.
6. Budincevic H, Ivkosic A, Martinac M, Trajbar T, Bielen I, Csiba L: Asymptomatic dissecting intimal lesions of common carotid arteries after carotid endarterectomy. *Surg Today* 2015, 45(10):1227-1232.
7. Sharpe R, Sayers RD, McCarthy MJ, Dennis M, London NJ, Nasim A, Bown MJ, Naylor AR: The war against error: a 15 year experience of completion angioscopy following carotid endarterectomy. *Eur J Vasc Endovasc Surg* 2012, 43(2):139-145.
8. van der Kolk AG, de Borst GJ, Jongen LM, den Hartog AG, Moll FL, Mali WP, Hendrikse J: Prevalence and clinical consequences of carotid artery residual defects following endarterectomy: a prospective CT angiography evaluation study. *Eur J Vasc Endovasc Surg* 2011, 42(2):144-152.
9. Marone EM, Coppi G, Tshomba Y, Chiesa R: Eight-year experience with carotid artery stenting for correction of symptomatic and asymptomatic post-endarterectomy defects. *J Vasc Surg* 2010, 52(6):1511-1517.
10. Vidjak V, Krnic A, Novacic K, Slavica M, Lovrencic-Huzjan A, Demarin V: [Stenting of dissected carotid arteries as a minimally invasive treatment modality]. *Lijec Vjesn* 2012, 134(1-2):12-19.
11. Togay-Isikay C, Kim J, Betterman K, Andrews C, Meads D, Tesh P, Tegeler C, Oztuna D: Carotid artery tortuosity, kinking, coiling: stroke risk factor, marker, or curiosity? *Acta Neurol Belg* 2005, 105(2):68-72.
12. Mumoli N, Cei M: Asymptomatic carotid kinking. *Circ J* 2008, 72(4):682-683.
13. De Ridder D, Vanneste S, Menovsky T: Pulsatile Tinnitus due to a Tortuous Siphon-Like Internal Carotid Artery Successfully Treated by Arterial Remodeling. *Case Rep Otolaryngol* 2013, 2013:938787.
14. Lukyanchikov VA, Khasauov RK, Kordonskaya OO, Dalibaldyan VA, Senko IV: Endoscopy-assisted surgical treatment of carotid artery kinking. *Khirurgiia (Mosk)* 2020(2):13-20.
15. Ballotta E, Thiene G, Baracchini C, Ermani M, Militello C, Da Giau G, Barbon B, Angelini A: Surgical vs medical treatment for isolated internal carotid artery elongation with coiling or kinking in symptomatic patients: a prospective randomized clinical study. *J Vasc Surg* 2005, 42(5):838-846; discussion 846.