



Successful Repair of Post-Operative Carotid Malperfusion after Arch Replacement in Type A Aortic Dissection

Dong Jin Kim^{1*} and Jung Eon Park²

¹Department of Thoracic and Cardiovascular Surgery, Sejong General Hospital, Republic of Korea

²Department of Neurosurgery, Sejong General Hospital, Republic of Korea

Abstract

Malperfusion may persist or newly develop after correction of acute type A aortic dissection in the peri-operative period. We report 3 cases of successful correction of post-operative carotid malperfusion after repair of type A aortic dissection.

Introduction

Pre- and post-operative cerebral malperfusion is a severe clinical condition with strong potential for adverse outcomes in patients undergoing surgery for acute type A aortic dissection. We, herein, describe 3 cases of successful correction of post-operative carotid malperfusion after repair of type A aortic dissection.

Materials and Methods

Patient 1

A 76-year-old woman was emergently transferred to our hospital for type A aortic dissection. The patient underwent total arch replacement with a 28 mm 4-branched vascular (Gelweave®) graft. Mental state was clearly found 2 h post-operatively, but after 7 h later it changed to a drowsy state with only weak left side movement. Compromised LCCA flow was confirmed on angiography. The patient emergently underwent carotid bypass. Left neck incision was performed and the LCCA was exposed. The sternum was reopened and a tunnel was made to the neck incision site for a bypass graft. The previous LCCA anastomosis site was divided and new bypass was performed between the LCCA to the previous anastomosis site of the 4-branched graft with a 7 mm ringed PTFE (Gore-Tex®) graft in an end to end fashion (Figure 1A). The patient's neurological state improved quickly, and was nearly normalized 4 days later. Her right arm systolic pressure dropped to 50 mmHg on the 20th post-operative day without any neurological deficit. Computed Tomographic (CT) angiography was performed, and it demonstrated Innominate Artery (IA) flow reduction. Implantation of a 10 mm × 40 mm EPIC (Boston Scientific Corp., Natick, MA, USA) stent into the stenotic portion of the IA was performed (Figure 1B). Recovery of blood pressure was confirmed in the catheterization lab and the patient was discharged without any neurological sequelae.

Patient 2

A 64-year-old male patient was emergently transferred to our institution with a diagnosis of type A aortic dissection. The patient underwent partial arch (IA & LCCA) replacement with a 12 mm to 10 mm trifurcated vascular graft and a 28 mm 1-branched vascular graft. The patient was extubated on the next day, but after the 2nd post-operative day, the patient's clear mental state changed to a drowsy state with minimal movement even on great stimulus. Right Subclavian Artery Flow (RSCA) was visible but Right Common Carotid Artery (RCCA) obstruction was confirmed on CT (Figure 2A). A new bypass was performed between the RCCA to the main vascular graft with an 8 mm ringed PTFE graft in an end to side fashion (Figure 2B). The previous IA anastomosis site was preserved because there was flow to the RSCA. The patient was extubated 4 days after carotid bypass and discharged without any neurological sequelae.

Patient 3

A 56-year-old patient was admitted to our hospital with type A aortic dissection. The patient underwent partial arch (IA & LCCA) replacement. On initial physical examination after arriving at the ICU, size of both pupils was intact with a prompt to light reflex. But about 3 h later, the left side pupil was dilated (6 mm) and the light reflex could not be checked. Severe narrowing of

OPEN ACCESS

*Correspondence:

Dong Jin Kim, Department of Thoracic and Cardiovascular Surgery, Sejong General Hospital, 489, girl Hohyeon-ro, Sosa-gu, Bucheon-si, Gyeonggi-do, 422-711, Republic of Korea, Tel: +82-32-340-1436; Fax: +82-32-340-1236; MP: +82-10-8012-2108; E-mail: shallbe@hanmail.net

Received Date: 29 Sep 2020

Accepted Date: 19 Oct 2020

Published Date: 22 Oct 2020

Citation:

Kim DJ, Park JE. Successful Repair of Post-Operative Carotid Malperfusion after Arch Replacement in Type A Aortic Dissection. *Ann Cardiovasc Surg*. 2020; 3(1): 1024.

Copyright © 2020 Dong Jin Kim. This is an open access article distributed under the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

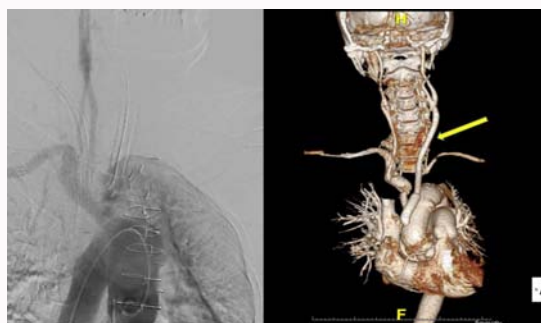


Figure 1A: LCCA flow compromise (Left), Anastomosis of LCCA to previous anastomosis site of the main graft (end to end) (Right).



Figure 1B: Severe narrowing of IA (Left), Implantation of EPIC stent (Right).

both CCAs with total occlusion of the left Internal Carotid Artery (ICA) with a weak flow in the left Middle Cerebral Artery (MCA) was noted on CT. Emergent ICA stent was deployed with a 9 mm × 50 mm Wallstent (Boston Scientific) in the stenotic segment. The patient was extubated on the next day and was discharged without any neurological sequelae.

Discussion

Malperfusion of systemic organs is a complication of aortic dissection caused by branched vessel involvement and usually surgical correction effectively reduces pre-operative malperfusion. However, malperfusion may persist post-operatively and is strongly associated with adverse immediate and long-term outcomes [1].

Case 1 and 2 patients were stable initially but neurologic deterioration aggravated post-operatively. The reason for neurologic deterioration seems to be a change in the flow to the cerebral circulation. In the acute stage, the dissection flap in the vessel lumen can be patent initially, but it may change in a short period to dynamic or static obstruction. Figure 1A shows a patent lumen in the prebifurcation area of the IA, but obstruction newly developed few days later, as shown in Figure 1B. Figure 2A shows a patent RSCA, but obstruction newly developed in a short period of time, as shown in Figure 2B.

In Case 3, the origin of malperfusion was in the ICA and the surgical approach was difficult. A stent graft was successfully deployed

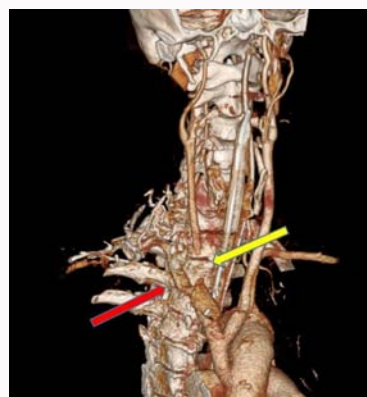


Figure 2A: RCCA obstruction (yellow arrow), preserved RSCA flow (red arrow).

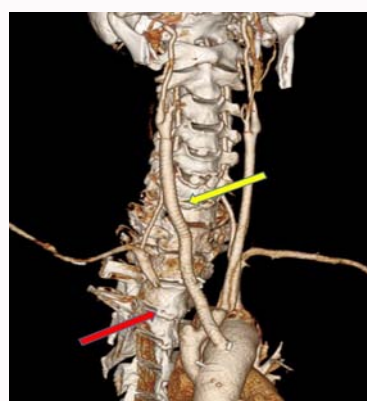


Figure 2B: RCCA to main graft anastomosis (yellow arrow). Newly appeared RSCA obstruction (red arrow). CT performed 14 days after carotid bypass.

without any complication. But we do not prefer intervention in all patients, because in case 1 when the flow compromise was in the artificial graft, the lumen was filled with a fresh hematoma and if the guide wire and stent graft were used, embolic stroke could be strongly expected. We advocate surgical correction rather than percutaneous intervention if the lumen obstruction is confirmed in the artificial graft.

Malperfusion may persist or newly develop after correction of acute type A aortic dissection in the peri-operative period. A high degree of vigilance is strongly recommended post-operatively, especially if the dissection flap is in the arch vessels. Early detection and surgical correction can result in a successful outcome, as found in these cases.

References

1. Nardi P, Olevano C, Bassano C, Bovio E, Cecchetti L, Forlani S, et al. The effect of postoperative malperfusion after surgical treatment of type A acute aortic dissection on early and mid-term survival. *Vessel Plus*. 2017;1:77-83.