Aggressive direct perfusion of the carotid artery during acute type A aortic dissection complicated with brain malperfusion

NO COI

Presenting Author

KYOKUN UEHARA

Introduction

Brain malperfusion secondary to acute aortic dissection results in higher in-hospital mortality

Some patients develop permanent neurological deficit even after central aortic repair

Objectives

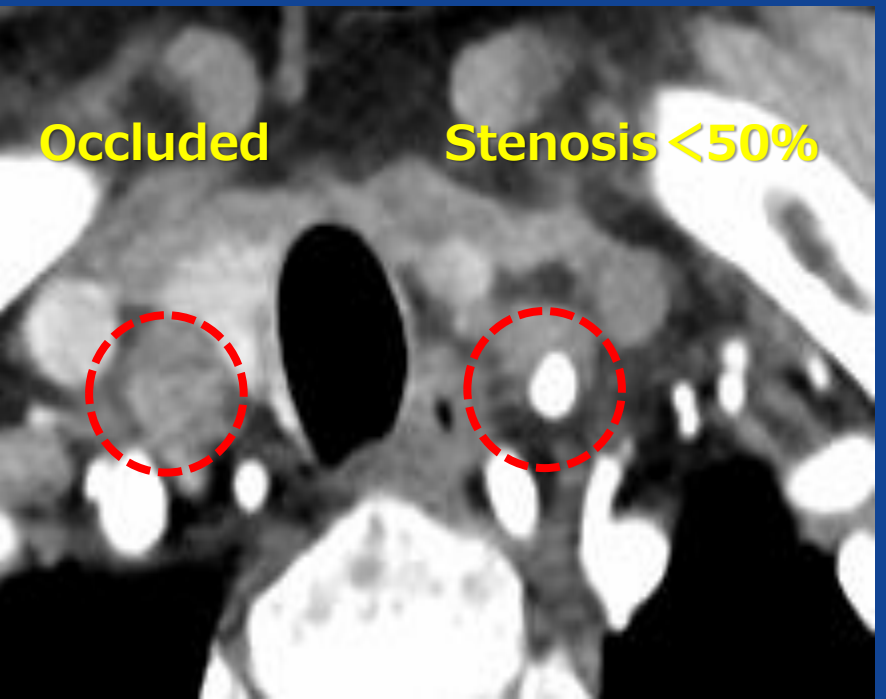
We evaluated surgical results of direct perfusion to the carotid artery during acute type A aortic dissection (AAAD) repair complicated with brain malperfusion

Brain malperfusion

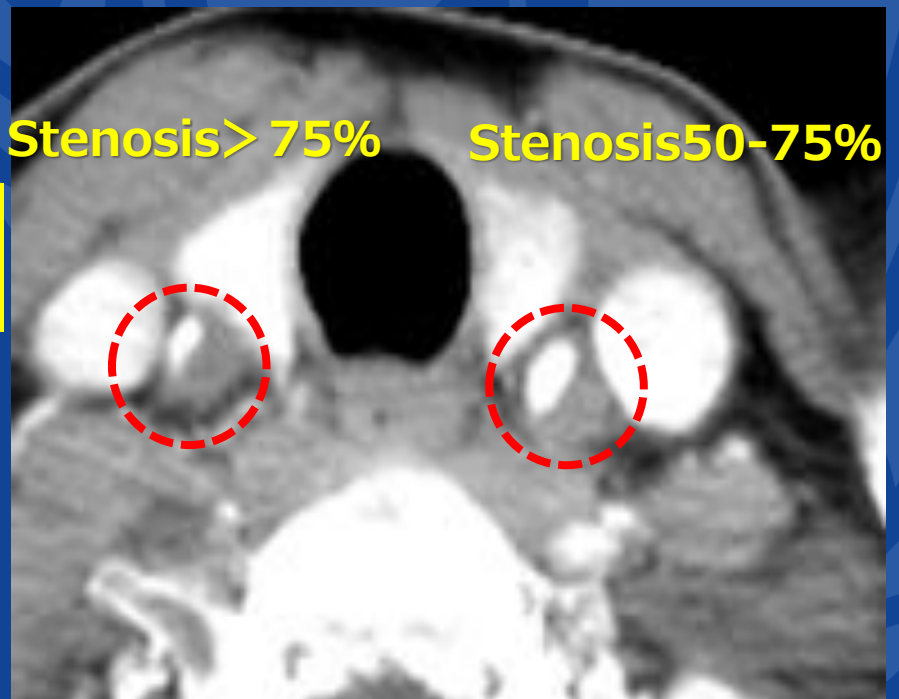
2014～2022

AAAD repair N=175

Carotid artery stenosis > 75%（rt / lt / both）



N=21 (12%)



Patients

	N（%)
Age (years)	70（53-89）
Male	9 (42.9)
Neck Vessels	
Brachiocephalic	
Stenosis (>75%)	7 (33.3)
Occluded	4 (19.0)
Right Common Carotid	
Stenosis (>75%)	6 (28.6)
Occluded	8 (38.1)
Left Common Carotid	
Stenosis (>75%)	2 (9.5)
Occluded	3 (14.2)
Consciousness level	
Alert	4 (19.0)
Left hemiplegia	11 (52.3)
Right hemiplegia	2 (9.5)
Drawsy	4 (19.0%)
Coma	2 (9.5)
Dysarthria	6 (28.6)
Conjugate deviation	5 (23.8)
Preoperative brain CT	18 (85.7)
Developed cerebral infarction	4 (19.0)

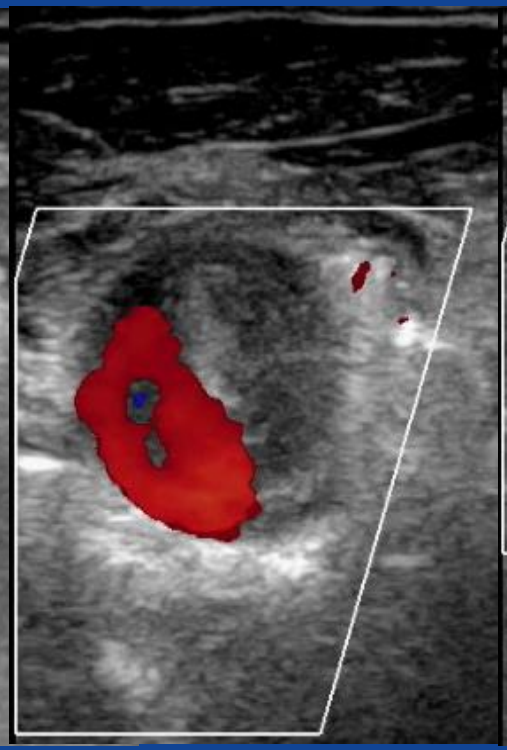
Cerebral perfusion

	N (%)
Onset to cerebral perfusion (min)	301 (192-1032)
Cerebral perfusion	
Antegrade selective cannulation (after CA)	13 (61.9)
Direct cannulation	
BCA direct cannulation	3 (14.2)
Bil SCA, lt CCA direct cannulation	2 (9.5)
BCA, lt CCA direct cannulation	2 (9.5)
Rt CCA direct cannulation	1 (4.8)

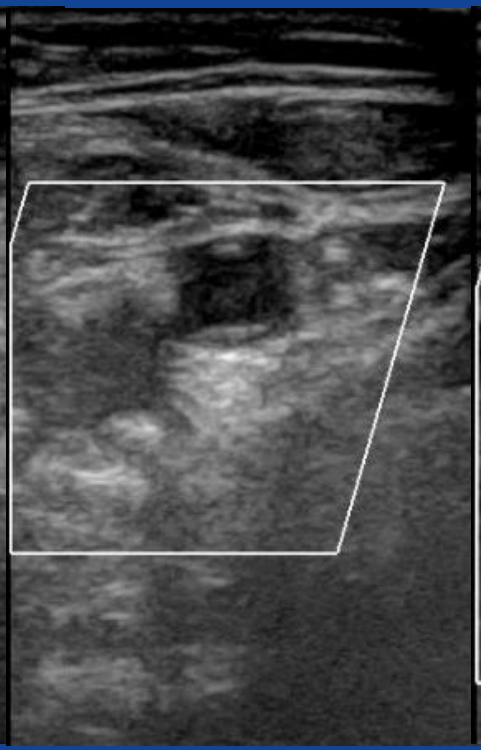
CA: circulatory arrest, BCA: brachiocephalic artery, Bil: bilateral, SCA: subclavian artery, lt: left, CCA: common carotid artery, rt: right

Blood flow in the rt carotid artery

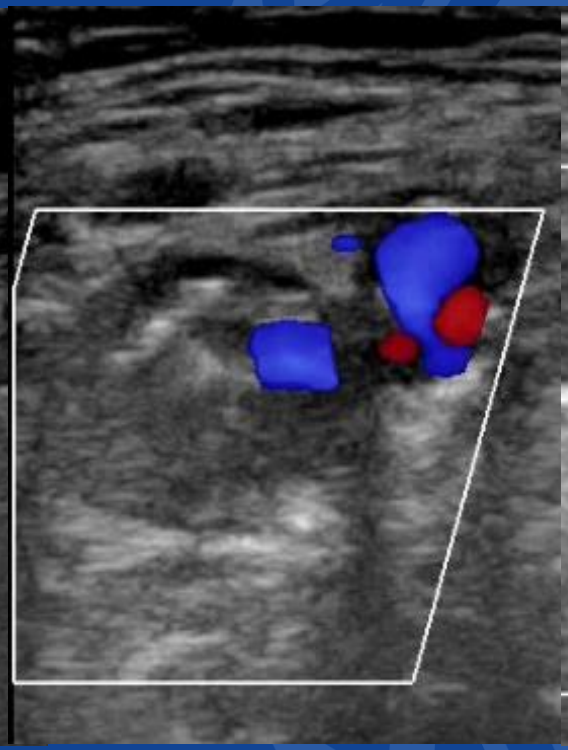
Before surgey



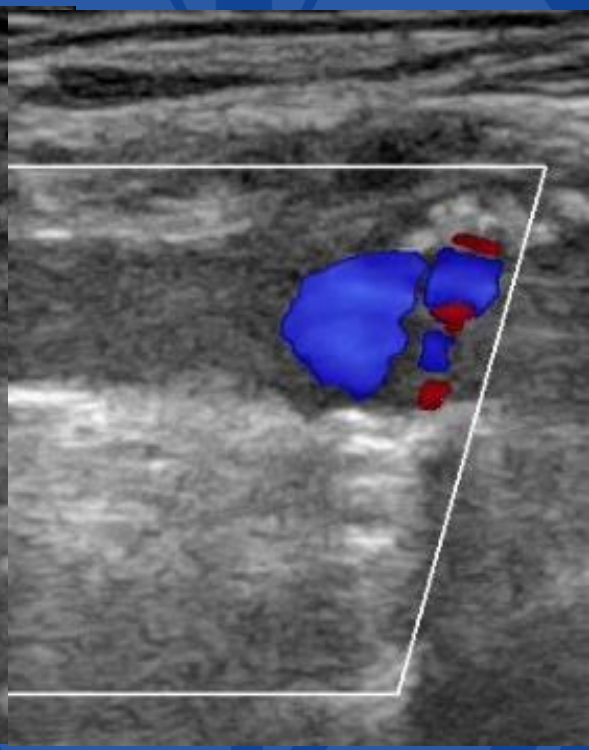
Direct cannulation



Flow(-)
After cannulation to the lt CCA, SCA (one rollar pump)



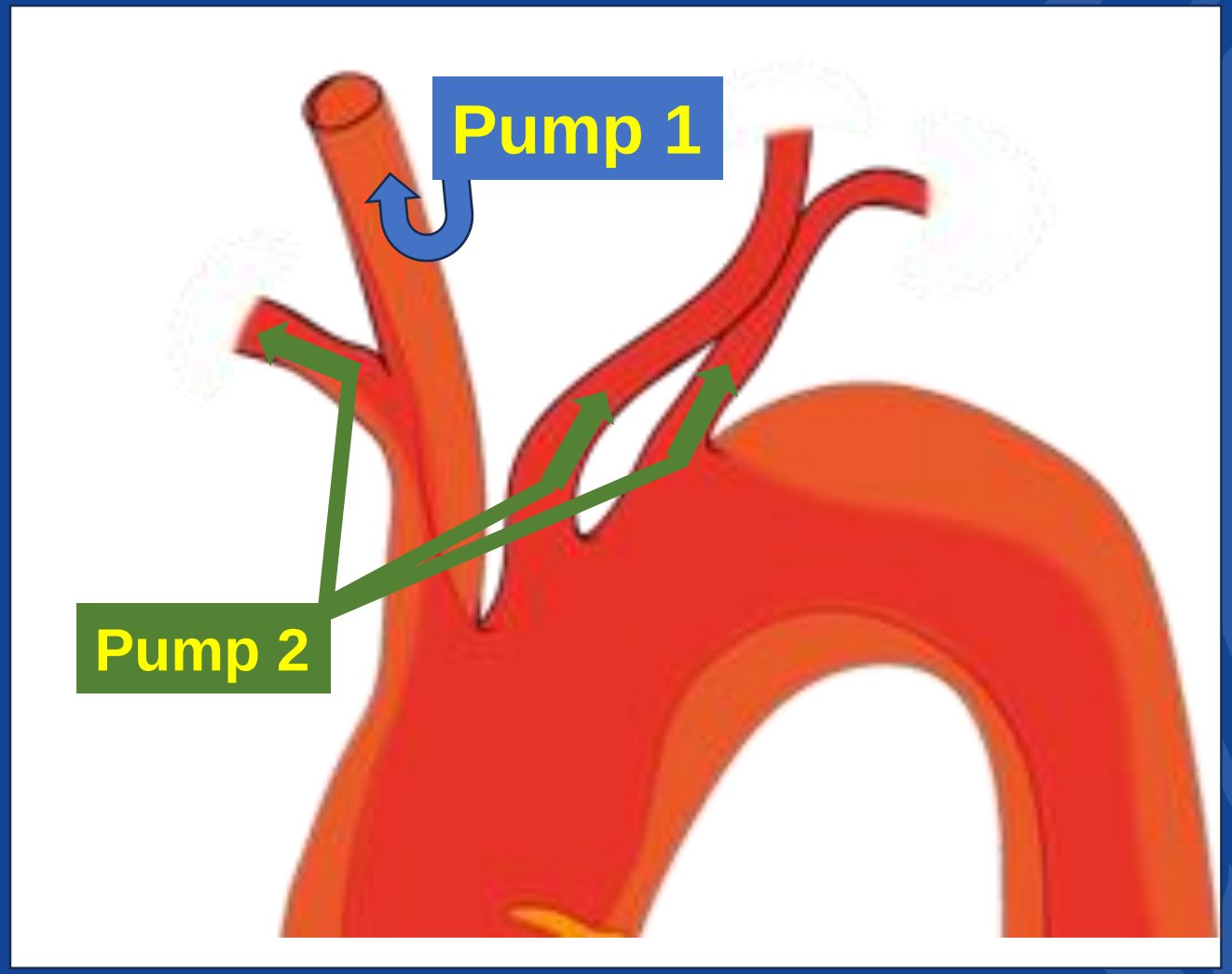
Two rollar pumps



After TAR

CA: circulatory arrest, BCA: brachiocephalic artery, Bil: bilateral, SCA: subclavian artery, lt: left, CCA: common carotid artery, rt: right , TAR: total arch replacement

Two pumps for Antegrade Cerebral Perfusion



Exclusive perfusion to the malperfused artery

Operative outcomes

	N=21	ACP under CA (N=13,%)	Direct cannulation (N=8,%)	p
Aortic replacement				
Ascending	7 (33.3)	5 (38.5)	2 (25.0)	0.27
Partial arch	9 (42.9)	5 (38.5)	4 (50.0)	0.32
Total arch	5 (23.8)	3 (23.1)	2 (25.0)	0.46
Concomitant surgery				
Root replacement	1 (4.8)	0	1 (12.5)	0.18
Tricuspid annuloplasty	1 (4.8)	0	1 (12.5)	0.18
Operation (min)	377 (259-558)	342 (238-558)	437 (304-523)	0.056
CPB (min)	204 (156-346)	186 (156-286)	251 (194-346)	0.026
Myocardial ischemia (min)	118 (80-228)	118 (86-186)	121 (80-228)	0.58
Cerebral perfusion (min)	73 (32-242)	56 (32-134)	136 (35-242)	0.021
Lower body CA (min)	47 (36-69)	48 (42-69)	45 (36-69)	0.65
In-hospital mortality	0	0	0	-
Discharged ambulatory	7 (33.3)	1 (7.6)	6 (75.0)	0.0019
Hospital stay (days)	40 (10-381)	46 (22-61)	69 (10-381)	0.48
Neurological signs				
Improved	18 (85.7)	11 (84.6)	7 (87.5)	0.43
Unchanged, worsened	3 (14.2)	2 (15.4%)	1 (12.5)	0.43
Decompressive craniotomy	3 (14.2)	2 (15.4)	1 (12.5)	0.43
Tracheostomy	5 (23.8)	4 (30.8)	1 (12.5)	0.17

In conclusion

Aggressive direct reperfusion of the carotid artery before the aortic repair using two rollar pumps may reduce neurological complications during AAAD repair in patients with brain malperfusion.