

Results of craniotomy for postoperative cerebral edema in patients with Stanford type A acute aortic dissection complicated with cerebral malperfusion.

Yuki Tadokoro

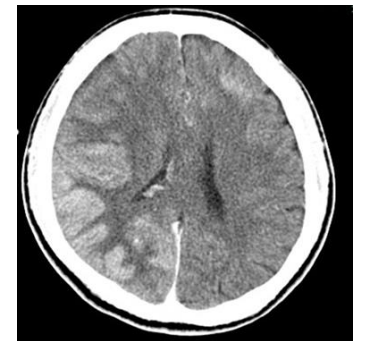
Kento Shinzato, Kazufumi Yoshida, Yojiro Koda,

Kenta Masada, Yoshimasa Seike, Yosuke Inoue

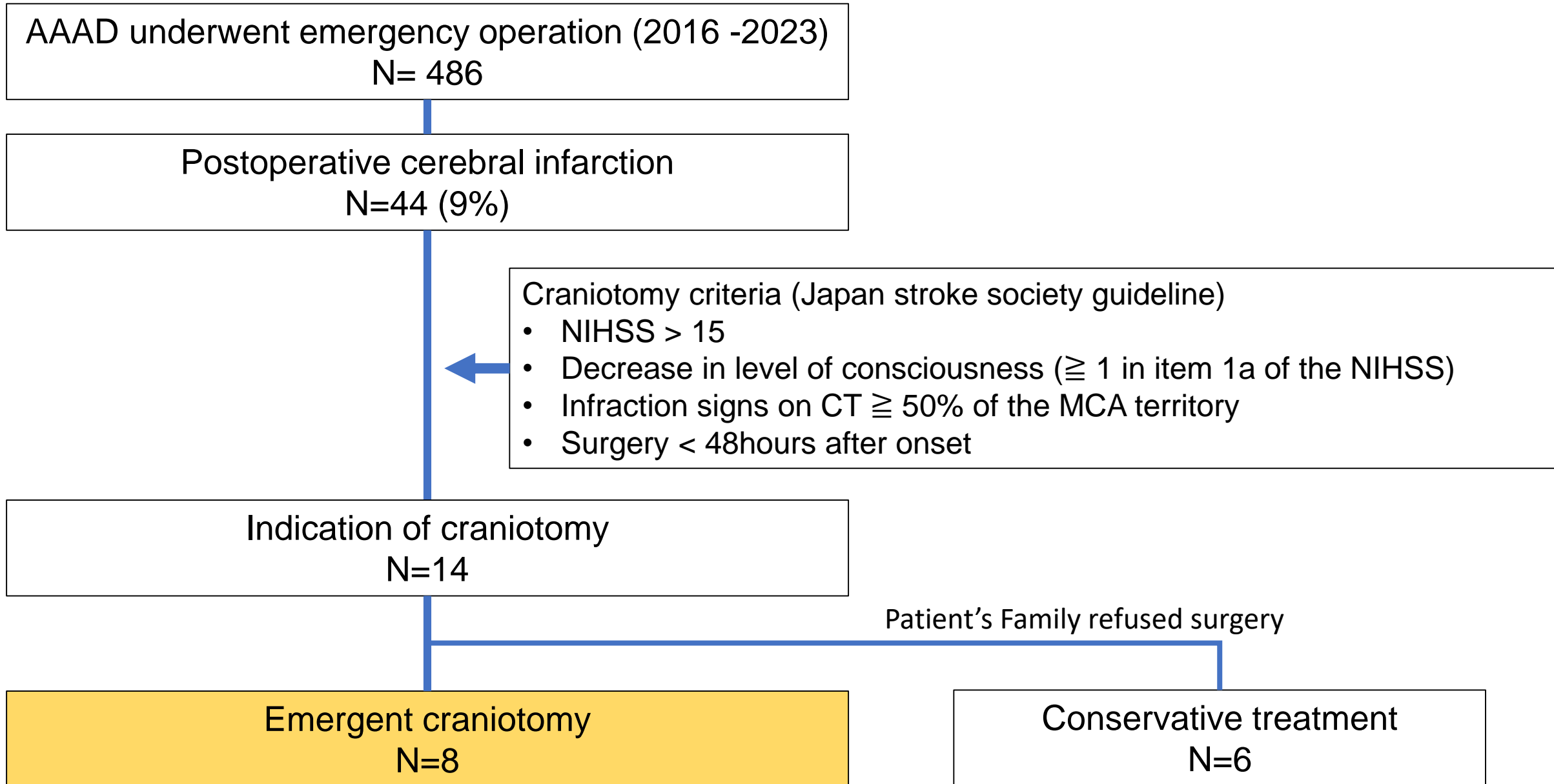
National Cerebral and Cardiovascular Center Cardiovascular surgery

Background / Objective

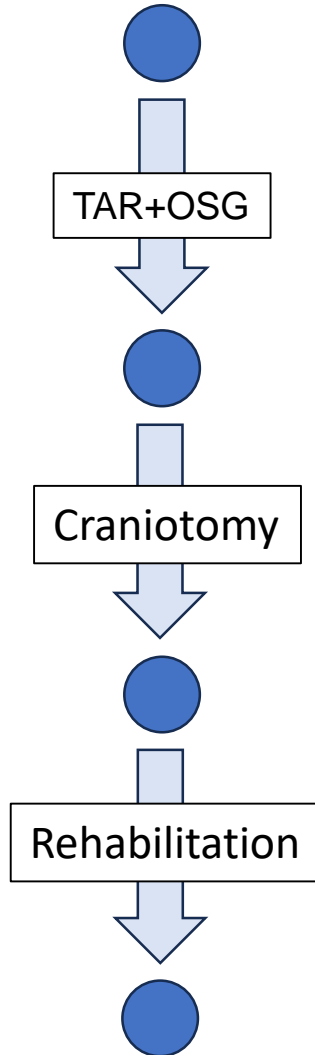
- ✓ The incidence of cerebral malperfusion in Stanford type A acute aortic dissection (AAAD) has been reported as high as 15%, and in hospital mortality 20-40% respectively. (Sultan et al. JTCVS 2021)
- ✓ Among them, treatment options including emergent craniotomy for patients with worst profile such as postoperative cerebral edema has not yet unknown well.
- ✓ This study aim to reveal the early surgical outcomes in patients with Stanford type A acute aortic dissection (AAAD) complicated with postoperative cerebral edema requiring emergent craniotomy



Study enrollment



Case presentation 1. 36Y Male



Arrival

GCS 6 (E1V1M4), NIHSS 23

CT: AAAD with bilateral CCA stenosis

Head CT: No infraction signs

Post operative head CT

- Infraction signs $\geq 50\%$ of the MCA territory
- Cerebral herniation

Hospital discharge

mRS: 4

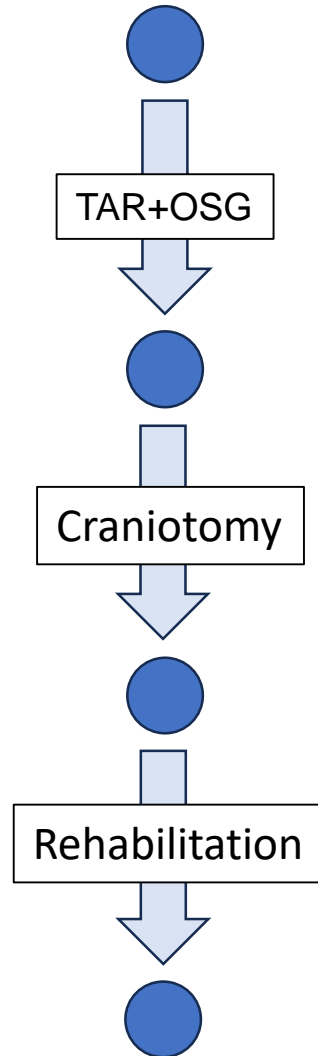
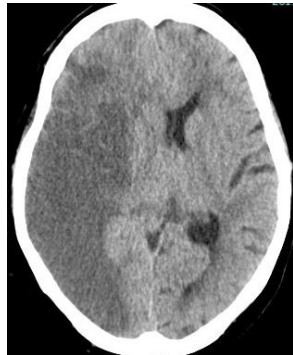
Last visit

mRS 1

Social reintegration

mRS: modified Rankin Score
CCA: Common Carotid Artery
MCA: Middle Cerebral Artery.

Case presentation 2. 68Y Female



Arrival

GCS 3 (E1V1M1), **NIHSS 32**

CT: AAAD with bilateral CCA stenosis and **right MCA occlusion**

Head CT: Infraction signs at MCA territory

Post operative head CT

- Infraction signs $\geq 50\%$ of the MCA territory
- Cerebral herniation

Hospital discharge

mRS: 5

Rehabilitation

Last visit

mRS: 5

mRS: modified Rankin Score
CCA: Common Carotid Artery
MCA: Middle Cerebral Artery.

Characteristic (Interval from onset to arrival & Symptoms)

Age/Gender	Onset to arrival (min)	Shock	Symptoms	Neurological status	
				GCS (E/V/M)	NIHSS
30 / M	240	-	Back pain	15 (4.5.6)	0
33 / F	360	-	Dizziness, vomiting	15 (4.5.6)	0
69 / M	70	-	Left paraplegia	13 (3.4.6)	17
36 / M	60	-	Coma	6 (1.1.4)	23
66 / F	280	-	Coma	6 (1.1.4)	19
65 / F	60	-	Coma	3 (1.1.1)	31
68 / F	135	-	Coma	3 (1.1.1)	32
69 / F	150	-	Coma	3 (1.1.1)	29

Characteristic (Radiographical assessment)

Age/Gender	CCA true Lumen status		Intracranial Vessels	Preop Cerebral infraction	Other Malperfusion
	Right	Left			
30 / M	Occlusion	-	-	-	Arm & Leg
33 / F	Occlusion	Stenosis	-	-	-
69 / M	-	Stenosis	-	-	Leg
36 / M	Stenosis	Stenosis	-	-	RCA & Arm
66 / F	Stenosis	-	ICA stenosis	Yes	Leg
65 / F	Occlusion	-	ICA occlusion	Yes	Leg
68 / F	Stenosis	Stenosis	MCA occlusion	Yes	-
69 / F	Occlusion	-	ICA & MCA stenosis	Yes	Leg

CCA: Common Carotid Artery, ICA: Internal Carotid Artery, MCA: Middle Cerebral Artery.

Results

Age/Gender	Time from cerebral infraction diagnosis to craniotomy (hour)	Prognosis and mRS at hospital discharge	mRS at last visit	Social reintegration
30 / M	4	Alive / 2	-	No (Died)
33 / F	6	Alive / 3	1	Yes
69 / M	26	Alive / 3	2	Yes
36 / M	7	Alive / 4	1	Yes
66 / F	14	Alive / 4	3	Yes
65 / F	33	Alive / 5	4	No
68 / F	13	Alive / 5	5	No
69 / F	23	Alive / 5	5	No

mRS: modified Rankin Score

Summary

- ✓ In hospital mortality rate is **0%**.
- ✓ 50% patients reintegrated into society.
- ✓ **NHSS > 25** and **ICA/MCA stenosis or occlusion** had poor neurological prognosis even after craniotomy

Age / Gender	NIHSS	Intracranial Vessels	mRS at hospital discharge	mRS at last visit
30 / M	0	-	2	-
33 / F	0	-	3	1
69 / M	17	-	3	2
36 / M	23	-	4	1
66 / F	19	ICA stenosis	4	3
65 / F	31	ICA occlusion	5	4
68 / F	32	MCA occlusion	5	5
69 / F	29	ICA & MCA stenosis	5	5

Conclusion

In AAAD patients complicated with cerebral edema

- ✓ Craniotomy was required in selected patients (8/44).
- ✓ **No in hospital death was encountered.**
- ✓ Emergent craniotomy for cerebral edema after central repair of AAAD in patients with cerebral malperfusion improved prognosis not only to save life but for social reintegration.
- ✓ Further investigation is warranted to optimize the management of cerebral malperfusion complicated by AAAD.