



Outcomes of **fenestrated frozen elephant trunk technique**
in 150 patients with acute type A aortic dissection

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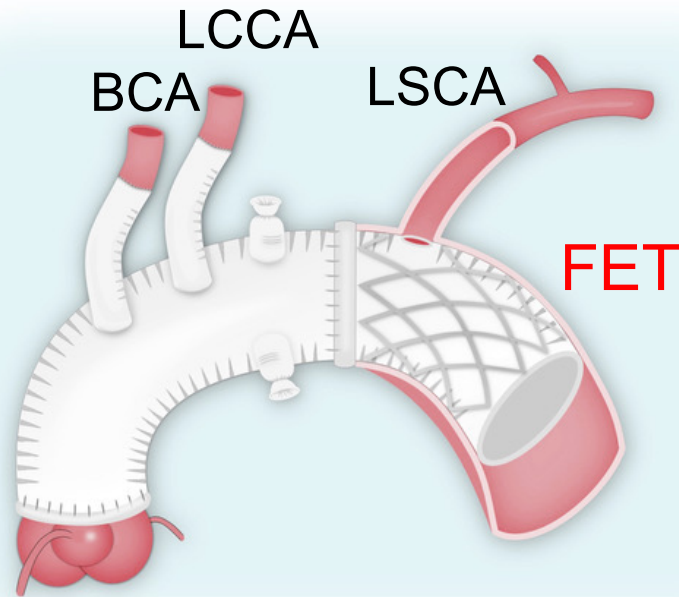
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Background

- ✓ In arch repair for acute type A aortic dissection (ATAAD), a frozen elephant trunk (FET) has been widely used.
- ✓ However, arch repair with a FET is technically demanding and associated with higher early mortality rate than hemiarch repair.
Yan Eur J Cardiothorac Surg. 2016;49:1392
- ✓ **A fenestrated FET technique** includes fenestration of FET with supra-aortic vessels perfusion via fenestration, which can expedite arch repair.
Roselli Ann Cardiothorac Surg. 2016;5:251
Okamura J Thorac Cardiovasc Surg. 2018;156:e75
Azuma Gen Thorac Cardiovasc Surg. 2023;71:331
- ✓ We investigated early and late outcomes of the fenestrated FET technique for ATAAD.

Advantages of the fenestrated FET technique



BCA: brachiocephalic artery
LCCA: left common carotid artery
LSCA: left subclavian artery

- ✓ **Proximalization of distal anastomosis**
- ✓ **No need for reconstruction of one or more supra-aortic vessels**
- ✓ **Less recurrent nerve injury**
- ✓ **Shorter hypothermic circulatory arrest time**

Patients and methods

- Between July 2014 and January 2023
- Surgery for ATAAD at Nerima Hikarigaoka hospital and Kyoto Katsura hospital.

341 patients



150 patients who underwent the fenestrated FET technique included in this study



Frozenix (Japan Lifeline, Japan)
used in all patients

Patient characteristics

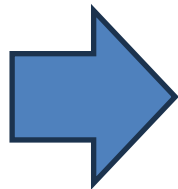
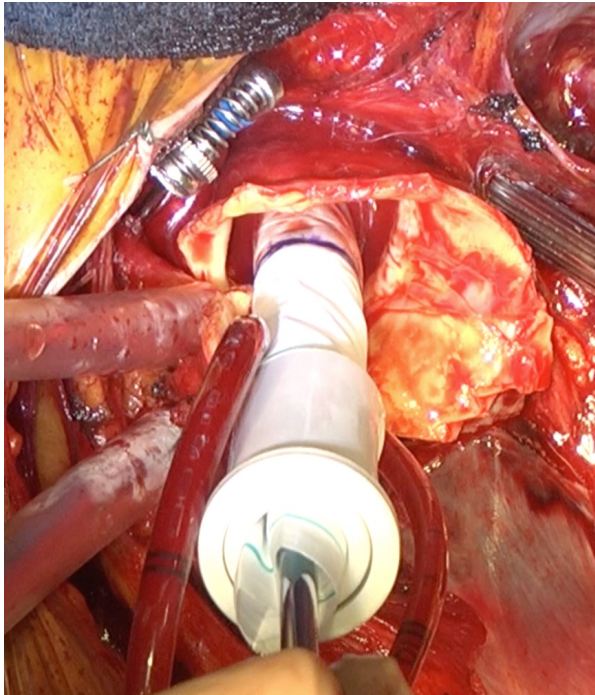
	<i>n</i> = 150
Age (years)	67 ± 15
Male sex	84 (56%)
Hypertension	108 (72%)
Atrial fibrillation	11 (7%)
Creatinine >1.5mg/dL	11 (7%)
Coronary artery disease	8 (5%)
Cerebral vascular disease	21 (14%)
Prior cardiac surgery	5 (3%)
Marfan syndrome	4 (3%)
Malperfusion	48 (32%)
Shock	33 (22%)
Cardiac arrest	6 (4%)
Onset to surgery <48hrs	123 (82%)

Operative procedures

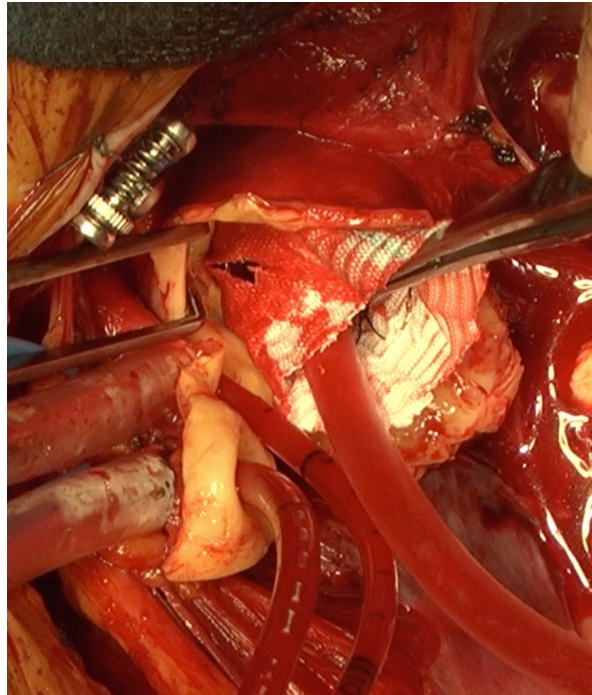
- ✓ Moderate hypothermic circulatory arrest
- ✓ Antegrade (+ retrograde) cold blood cardioplegia
- ✓ Antegrade selective cerebral perfusion
- ✓ Distal→proximal anastomosis→supra-aortic vessel reconstruction

Fenestrated FET technique

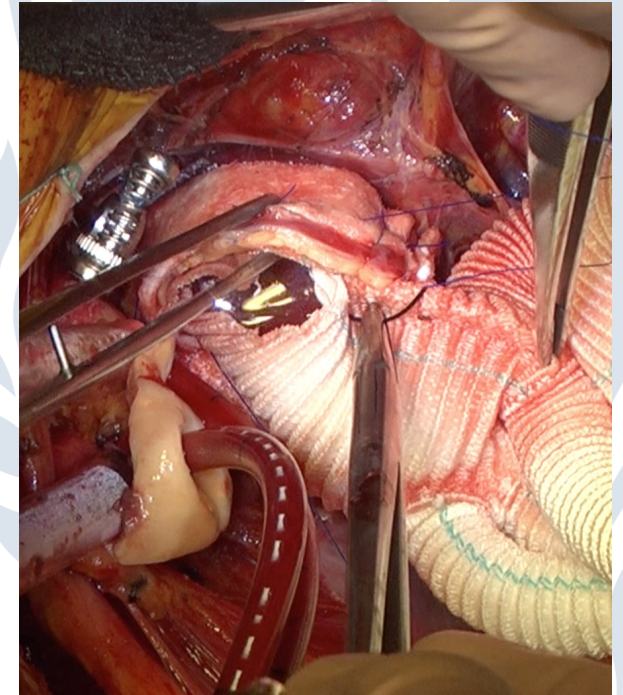
① Deployment of FET



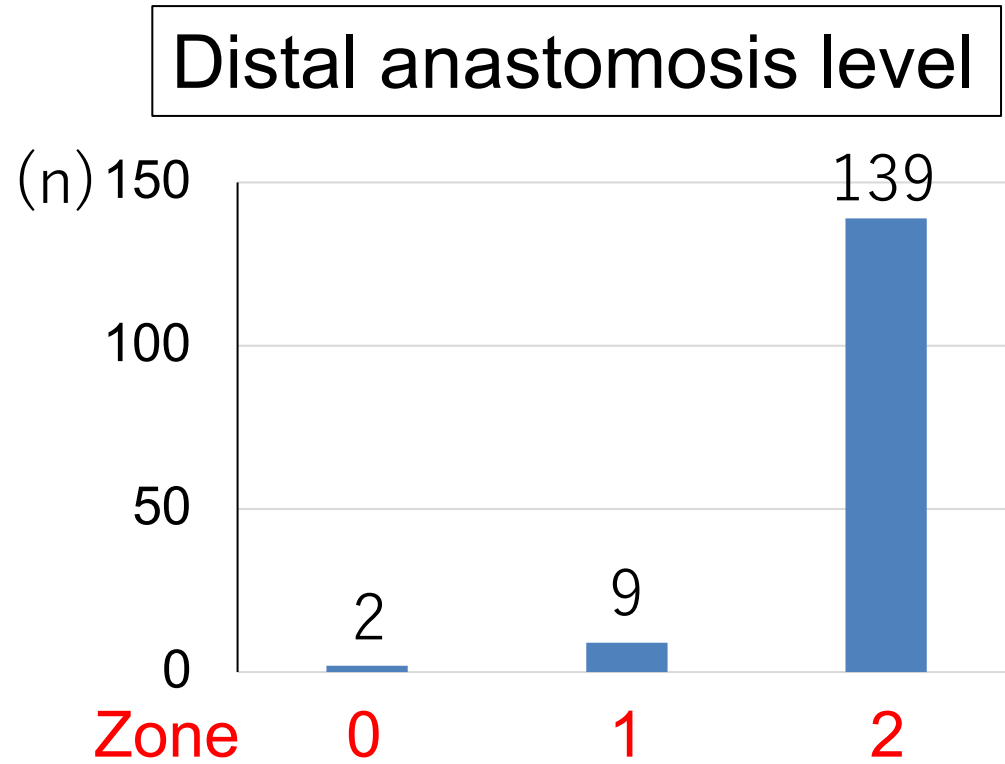
② Fenestration of FET



③ Distal anastomosis

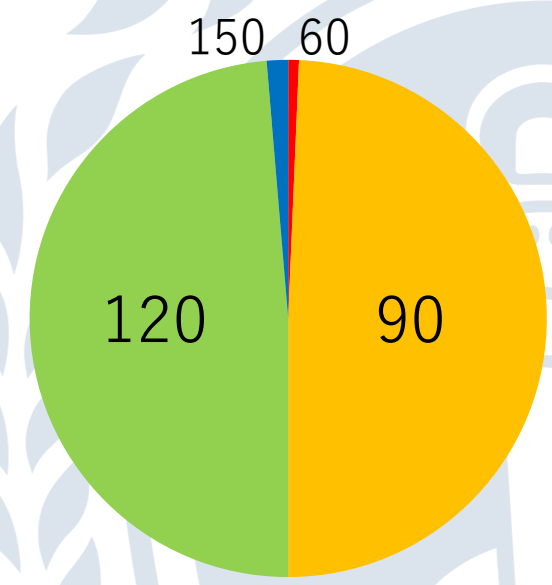


Operative data

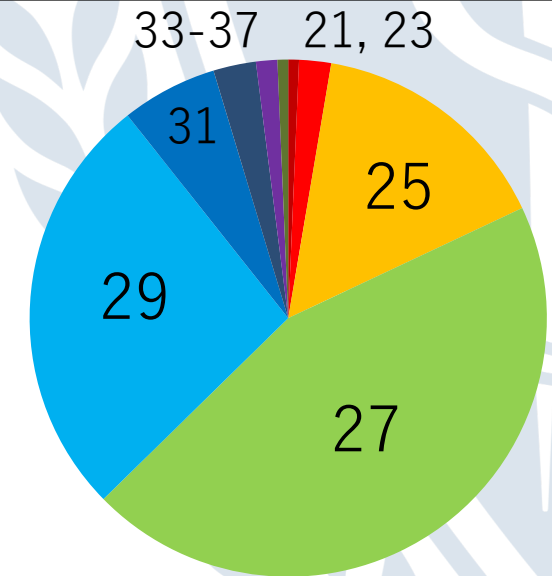


<i>Neck vessels perfused via fenestration</i>	BCA	LCCA	LSCA
	LCCA	LSCA	
	LSCA		

FET length (mm)

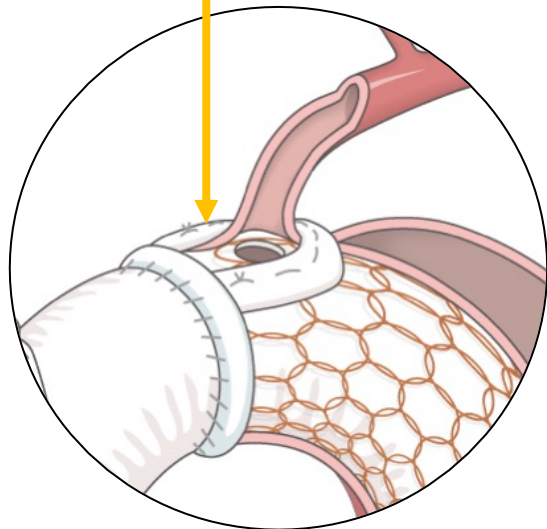


FET diameter (mm)



Operative data

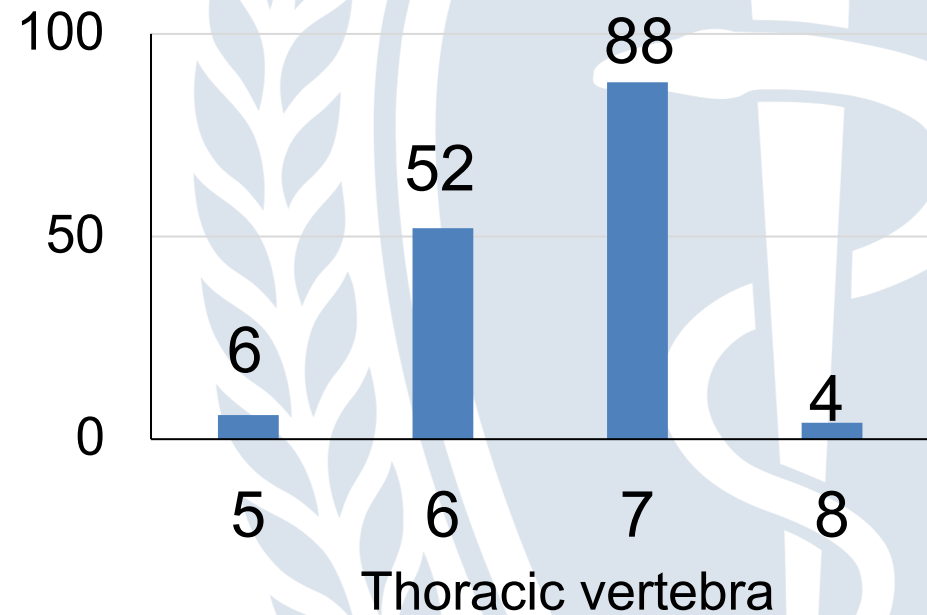
	<i>n = 150</i>
Operation time (min)	401 ± 110
Cardiopulmonary bypass (min)	224 ± 63
Cardiac ischemia (min)	132 ± 44
Lower body HCA (min)	59 ± 23
Concomitant procedure	35 (23%)
Suture fixation around fenestration	48 (32%)



For *endoleak prevention*

HCA: hypothermic circulatory arrest

Distal level of FET



Early outcomes

	<i>n = 150</i>
Overall 30-day mortality	7 (5%)
Stroke*	14 (9%)
Paraplegia	0
Paraparesis	2 (1%)
Occlusion of fenestration site	0
Re-exploration for bleeding	2 (1%)
Tracheostomy	3 (2%)
Acute kidney injury requiring dialysis	12 (8%)



* **NO** stroke found in the cerebral area perfused via fenestration

False lumen thrombosis rate at distal FET level
94.7% (at discharge)

42-year-old man, **single fenestrated FET**

(zone 2 anastomosis, fenestration for LSCA)

Preope



At discharge



3 months postope



3 years postope



49-year-old man, **total fenestrated FET**

(zone 0 anastomosis, fenestration for BCA, LCCA, and LSCA)

Preoperative

At discharge

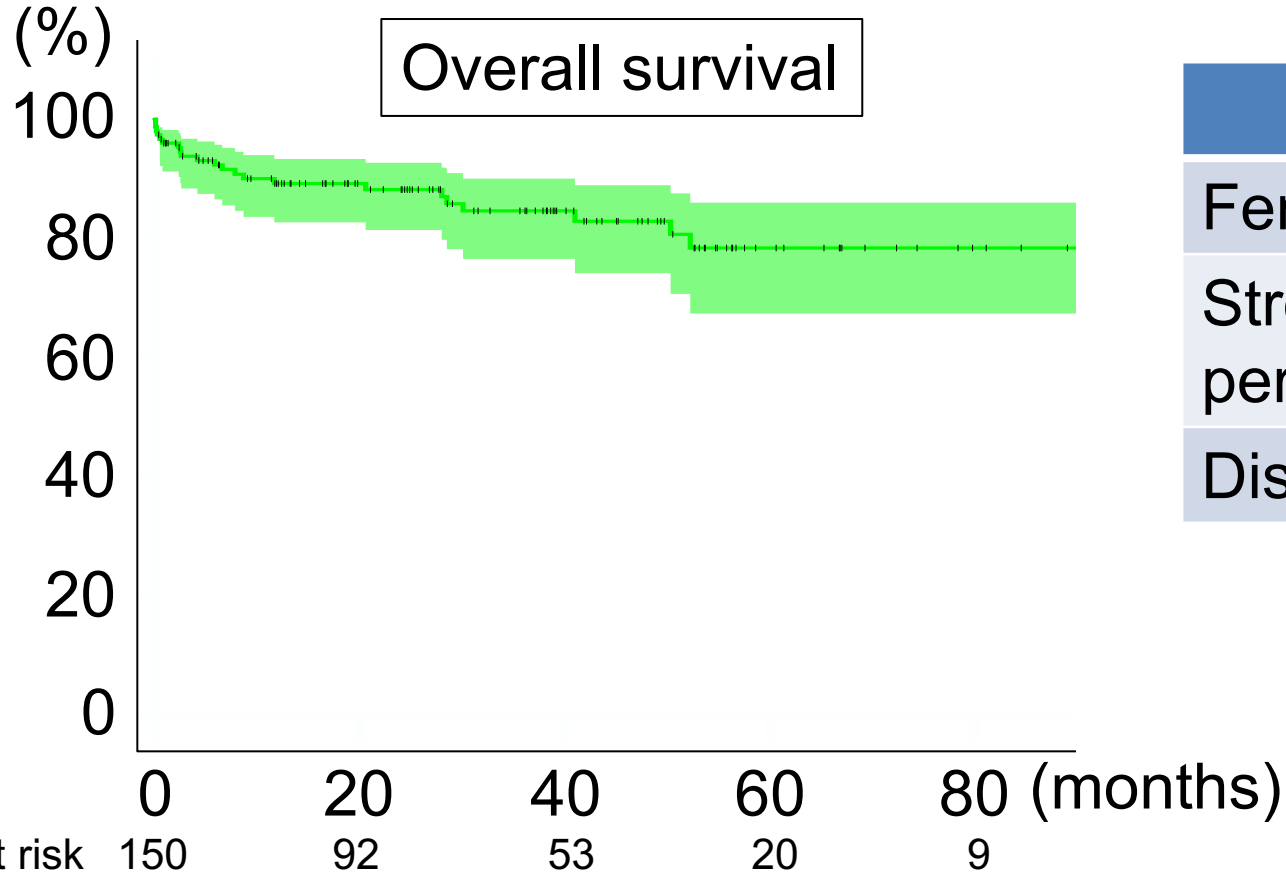
6 months postope

4 years postope



Late outcomes

✓ Median follow-up period: 28 months (0-111 months)



	<i>n</i> = 150
Fenestration occlusion	0
Stroke in the cerebral area perfused via fenestration	0
Distal SINE	2 (1%)

SINE: stent graft-induced new entry

Conclusions

- ✓ **The fenestrated FET technique** for ATAAD is a simple, safe, and effective procedure.
- ✓ This technique can facilitate extended aortic repair without the need for reconstruction of supra-aortic vessels in ATAAD.

