Left subclavian artery reconstruction in the frozen elephant trunk operation for acute type A aortic dissection

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Background

- The frozen elephant trunk has increasingly been used for acute type A aortic dissection. The trunk is frequently secured at zone 2, which may compromise left subclavian artery reconstruction.
- To facilitate reconstruction, the frozen elephant trunk may be fenestrated or bypass grafting to the left axillary artery has been employed. In the latter case, however, adhesion between the lung and the bypass graft may cause a problem during subsequent downstream aortic repair.
- We perform stress-free left subclavian artery reconstruction through a straight median sternotomy incision by dissecting the left common carotid artery and dividing the left anterior cervical muscles, which provides sufficient exposure of the left subclavian artery up to the vertebral artery take-off.

Objectives

- We report our technique of left subclavian artery exposure and compare the outcomes between those treated by fenestrated frozen elephant trunk and those treated by anatomical left subclavian artery reconstruction.

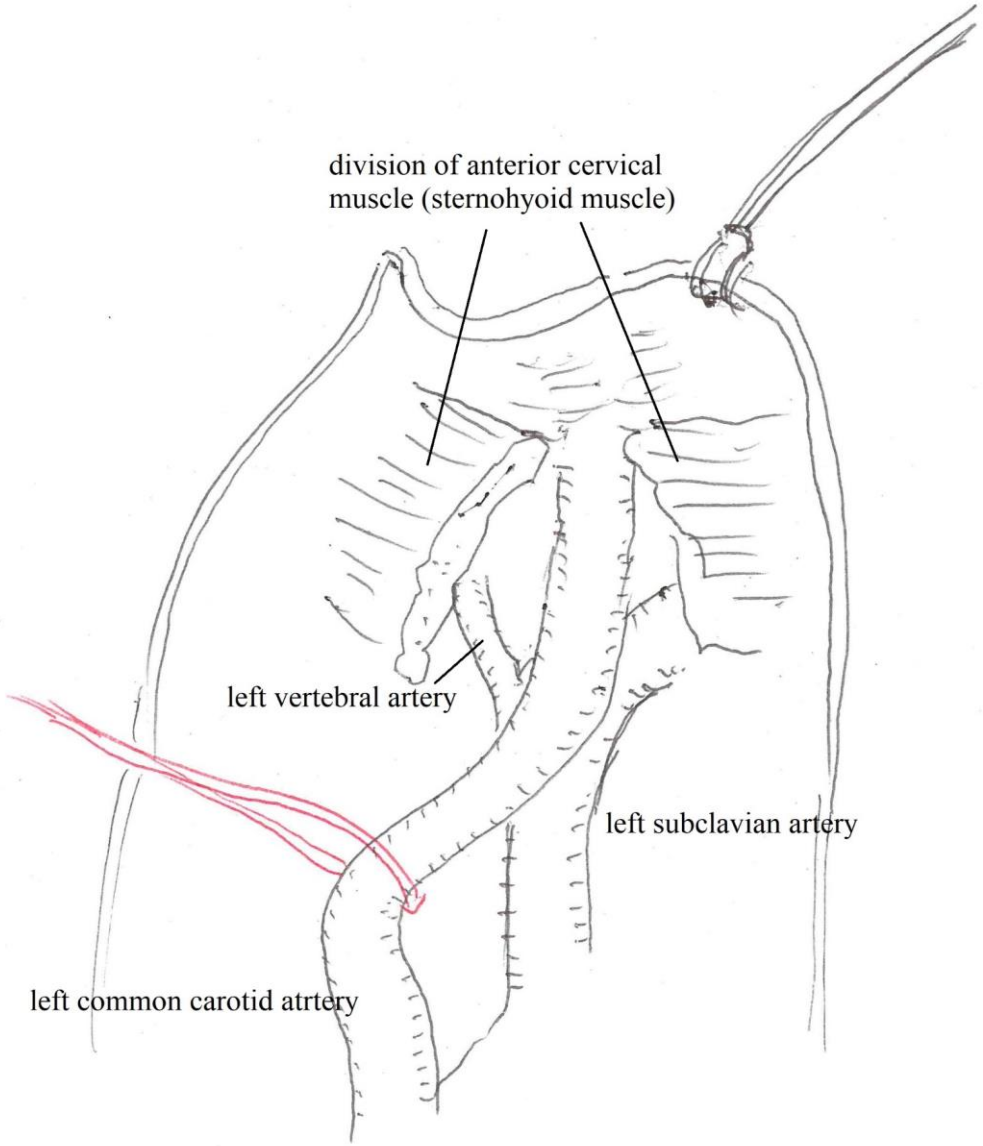
Patients and Methods

- Period September 2019 and October 2023
- Frozen elephant trunk op. for acute type A 23

  Patients requiring preoperative cardiopulmonary resuscitation were excluded.
- Anatomical reconstruction (A group) 11
- Fenestrated frozen elephant trunk (F group) 13

  8 with left subclavian fenestration and 5 with combined left carotid and subclavian fenestration
- Bypass grafting to the left axillary artery 0

- Patient characteristics, concomitant procedures, CPB time, AXC time, SCP time, in-hospital death, and postoperative descending aortic false lumen status were evaluated retrospectively.


division of anterior cervical
muscle (sternohyoid muscle)
left vertebral artery
left subclavian artery
left common carotid atrtery

Group A

Patient background

	Group A	Group F	
• Age	57 ± 12	61 ± 7	ns
• BW (kg)	73 ± 14	71 ± 18	ns
• BL (cm)	170 ± 13	169 ± 8	ns
• BSA (m2)	1.8 ± 0.2	1.7 + 0.7	ns

Concomitant procedures

	Group A	Group F	
• Bentall	3	2	ns
• MVP	0	1	ns

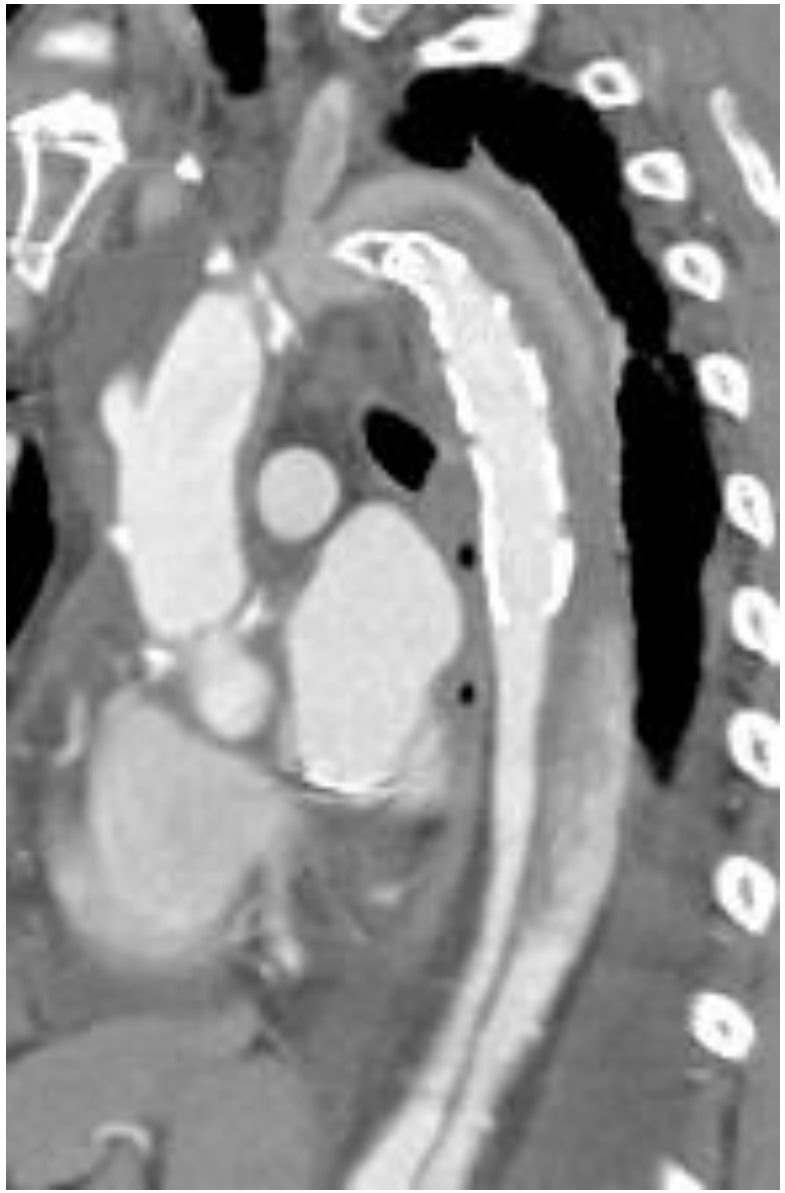
Operative data

	Group A	Group F	
• CPB time (min)	274 ± 80	251 ± 81	ns
• Ax time (min)	144 ± 48	164 ± 73	ns
• CA of lower torso (min)	56 ± 15	65 ± 8	ns
• SCP time (min)	180 ± 41	159 ± 65	ns
• In-hospital mortality	0	0	ns

Postoperative descending aortic false lumen status

- In the A group, false lumen thrombosis was obtained around the trunk except for one case with 3-channel dissection.
- In the F group, there was one case with residual blood flow from the re-entry in the left subclavian artery and 1 case requiring additional TEVAR due to residual false lumen blood flow from fenestration.

Group F



Residual blood flow from the re-entry in the LSA

Residual false lumen blood flow from fenestration.

Conclusion

- Our technique of left subclavian artery exposure provides optimal operative field for anatomical reconstruction.
- Anatomical reconstruction eliminates the time required to create fenestration, is associated with shorter circulatory arrest time, and reduce the incidence of residual false lumen blood flow.