

**Normothermic artery bypass and
visceral-anastomosis-first strategy in
thoracoabdominal aortic aneurysm repair**

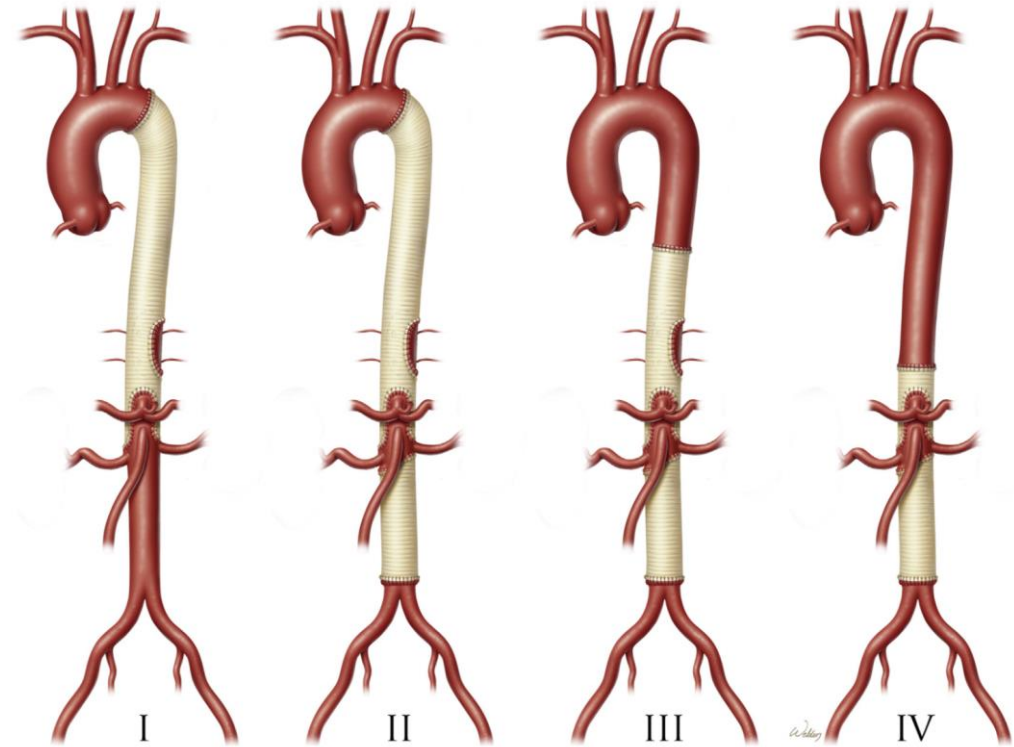


I have no conflict of interest to disclose



Objective

- Incidence rate as high as 5.9 per 100,000 person-years, TAAA surgery is hard to perform and prone to postoperative spinal cord injury
- Aim to demonstrate that the implementation of our normothermic artery bypass and visceral-anastomosis-first strategy in the repair of thoracoabdominal aortic aneurysm represents a safe and favorable clinical outcomes in terms of mortality, complications such as paraplegia and continuous renal replacement therapy (CRRT), as well as lower lactate levels



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Methods

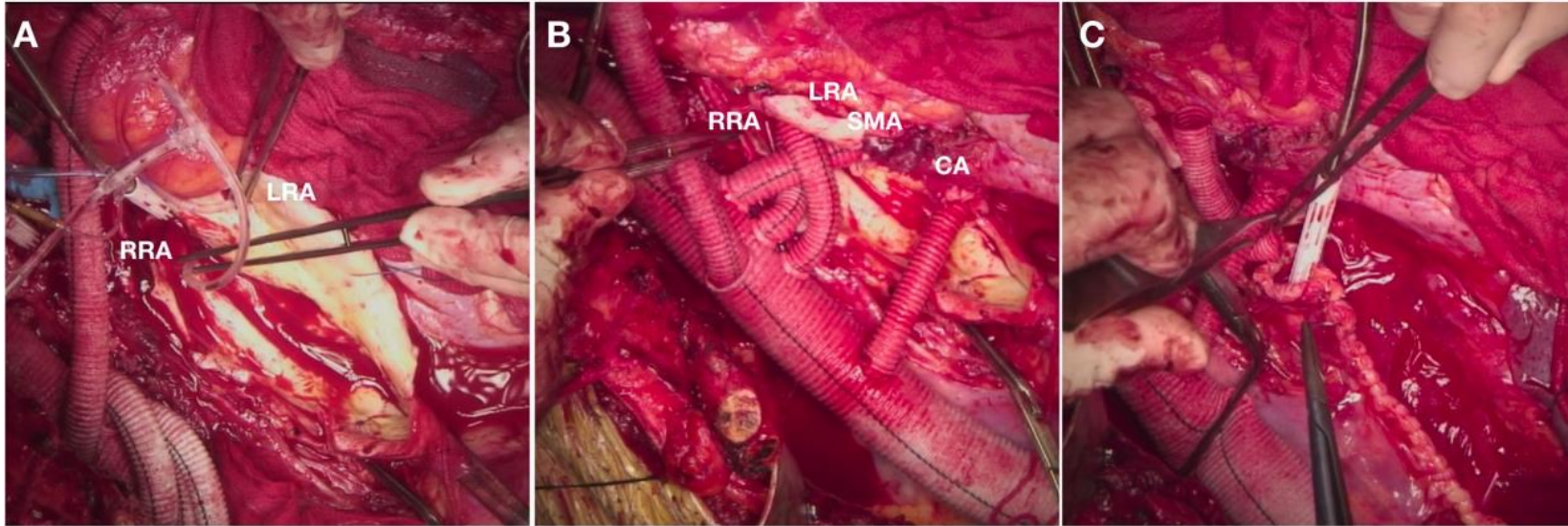
July 2019 to February 2022

26 patients (18 males and 8 females) underwent our strategy for TAAA repair

- The surgical procedure involved a combined left thoracoabdominal incision
- Initially, access to the artificial vessel was established through one of the four branches, providing entry into the proximal aorta
- Subsequently, anastomoses were sequentially performed for the abdominal trunk, superior mesenteric artery, renal artery, and intercostal artery
- Finally, the proximal and distal anastomoses were completed to ensure effective blood supply to the distal branches

To optimize normothermic iliac perfusion, with the primary objective of safeguarding the viscera and spinal cord, while minimizing blood damage and coagulation disorders

Strategy

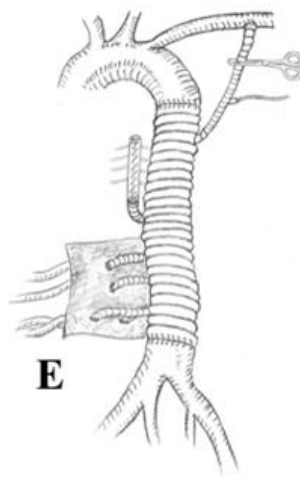
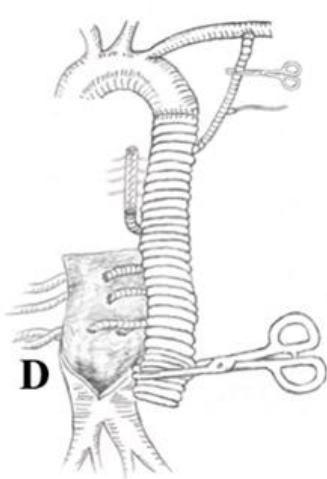
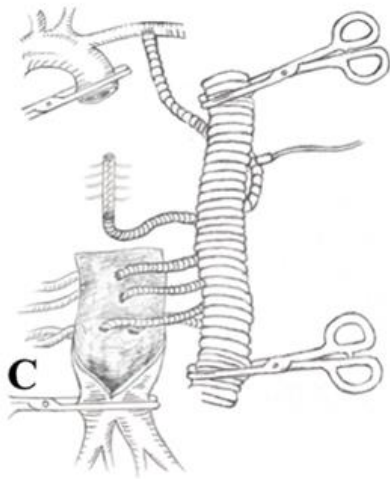
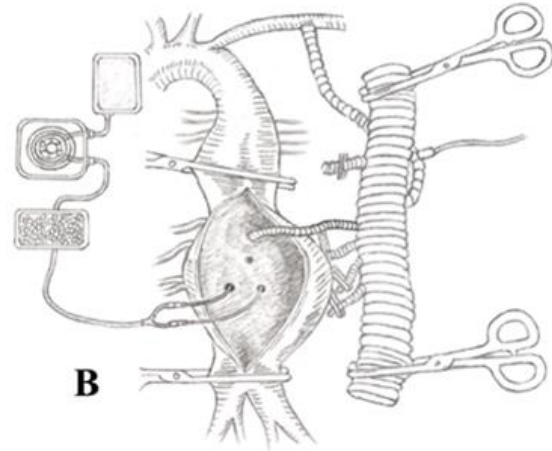
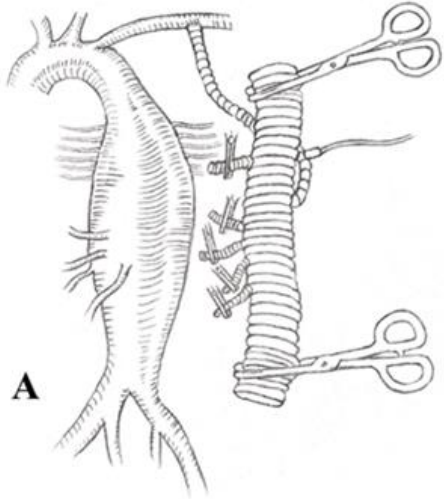


Intraoperative views

- A. The aorta was clamped proximal to CA and distal to the RA respectively.
The bilateral RA were perfused with cold HTK solution
- B. Visceral-anastomosis-first strategy, priority to recover the continuous antegrade perfusion of viscera
- C. The T8–L2 aorta was sutured to form an arterial tube for restoration the spinal cord perfusion

*(RRA, right renal artery; LRA, left renal artery; SMA, superior mesenteric artery; CA, celiac axis.)

Strategy



- A. End to side anastomosis was performed between a 10-mm Dacron graft and the axillary artery
- B. Reconstructed the CA with a 10-mm branch
- C. The T8–L2 aorta containing main feeding artery of the spinal cord was sutured to form an arterial tube, then anastomosed with the 10-mm branch for restoration blood flow to the spinal cord;
- D. The proximal of the 4-branched aortic graft was anastomosed to the proximal thoracic aorta
- E. The distal end of 4-branched graft to anastomose the distal abdominal aorta.

Result

Table 1 Demographical characteristics and clinical data of the patients

Variables	No.	%
Demographics		
Number of patients	26	
Male	18	69.2
Age, years, mean±SD	38.9±12.8	
BMI, kg/m ² , mean±SD	24±4	
Crawford extent II TAAA	12	46.2
Crawford extent III TAAA	6	23.1
Cardiovascular risk factors		
HTN	13	50.0
Hyperlipidemia	3	11.5
Smoking	3	11.5
CAD	2	7.7
Stroke/TIA	1	3.8
Chronic renal insufficiency*	1	3.8
Aortic dissection	19	73.1
Marfan syndrome	5	19.2
Previous aortic surgery	17	65.4

Abbreviations: SD, standard deviation; BMI, body mass index; HTN, hypertension; CAD, coronary artery disease; TIA, transient ischemic attack. *Serum creatinine level≥3.0 mg/dL or dialysis.

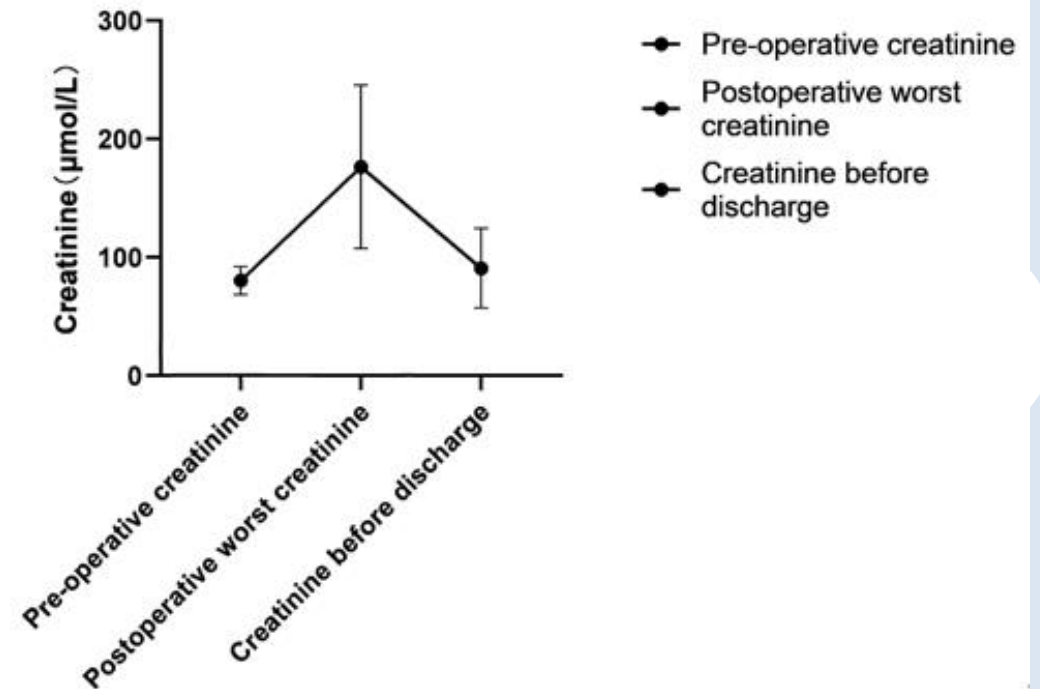
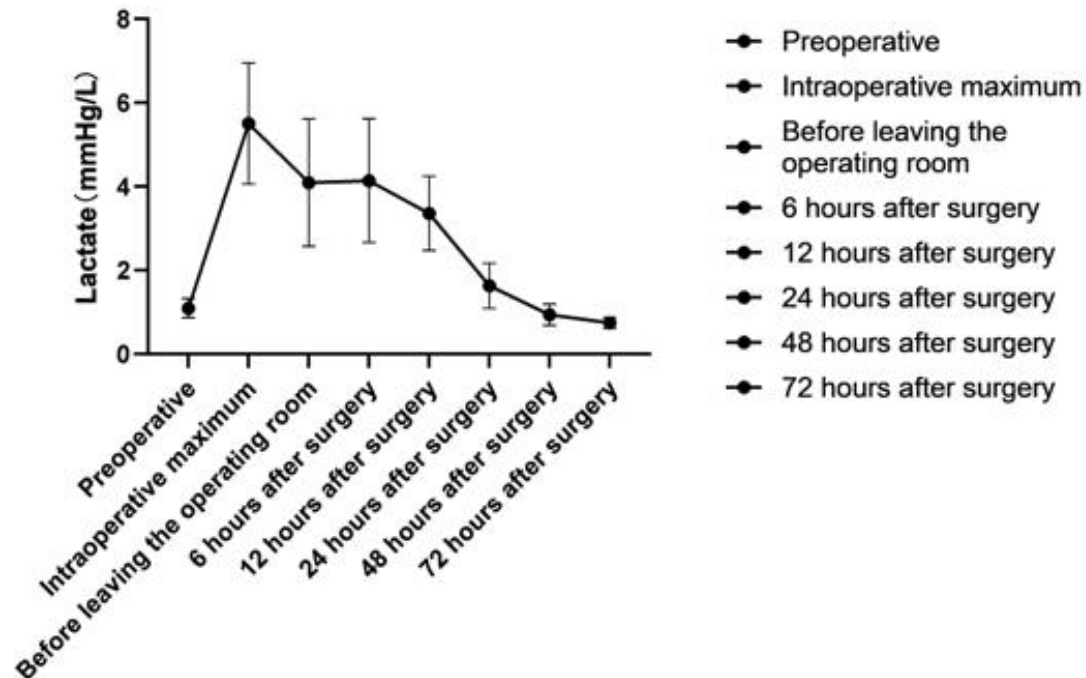
Table 2 Intraoperative and postoperative data of the patients

Characteristics	No. (%) or Mean ± SD
Operative time(minutes)	551.4±106.2
Maximum CSF pressure (mmHg)	9.3±6.0
RBCs (U)	3.7±3.6
Postoperative MV time(hours)	29.2±25.2
Postoperative ICU stay(days)	0.3±1.4
Postoperative hospital stay(days)	19.7±8.3
Thirty-day Mortality	0(0.0)
Acute renal failure/worsening RIFLE [†]	3(11.5)
New-onset dialysis	0(0.0)
SCI	0(0.0)
Bleeding requiring reoperation	1(3.8)

Abbreviations: ICU, intensive care unit; MV, mechanical ventilation; SD, standard deviation; CSF, cerebrospinal fluid; RBC, red blood cells; U, units; ICU, intensive care unit; SCI, spinal cord injury. [†]RIFLE criteria for acute kidney injury indicates risk, injury, failure, loss, and end-stage kidney disease.

- The mean age of the patients was 38.9±12.8 years (range, 15.0-58.0 years), with 18 patients (69.2%) being female.
- The most common presentation was Crawford type II aneurysms, observed in 46.2% of patients.
- The mean operative time was 551.4±106.2 minutes.

Result



- Typically, patients' lactate levels returned to normal within approximately 48 hours postoperatively. Prior to discharge, average creatinine levels were within the normal range.
- Only one patient required re-exploration due to bleeding; otherwise, there were no cases of postoperative paraplegia.
- The patients were discharged from the hospital with a median length of stay of 17.0 days. The mean follow-up time was 23.5 ± 9.3 months, with a follow-up rate of 100%. No late deaths occurred, and none of the patients required further surgery for aortic valve or other aortic diseases.

Conclusions

- **Open surgical repair of thoracoabdominal aortic aneurysm remains a crucial therapeutic approach and continues to be challenging**
- **The available data indicate that our normothermic artery bypass and visceral-anastomosis-first strategy represents a secure and replicable method, particularly when executed at an experienced center, can produce remarkable outcomes**

Thank you !

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