The 4th AAPCHS Annual Meeting

Experience of Video-assisted Thoracoscopic Atrial Appendage Resection for Refractory Atrial Tachycardia Originating from Atrial Appendage in Children in Single Center

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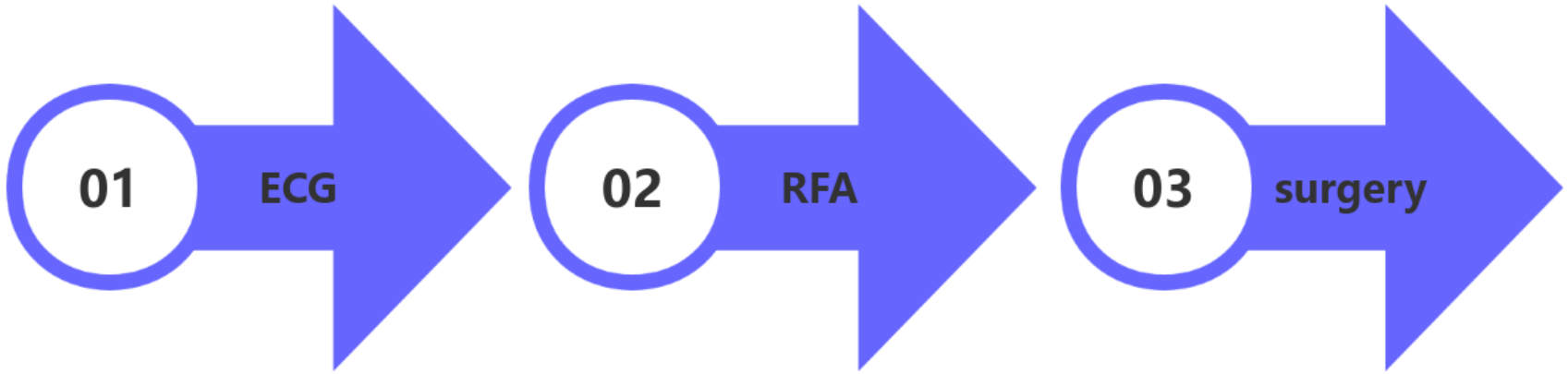
Atrial Appendage Tachycardia (AAT)

- In adults, focal atrial tachycardia originating from the atrial appendage is a less common type.
- **In children**, this rate comes to **31.6-40%**.*, with the **left atrial appendage** being the **most common site**.
- Most AAT require interventional treatment.

*： Di Biase L, Burkhardt JD, Mohanty P, et al. Left atrial appendage: an underrecognized trigger site of atrial fibrillation. Circulation,2010, 122(2): 109-118.DOI: 10.1161/CIRCULATIONAHA.109.928903

Strategy of Hybrid Treatment

For those resistant to pharmacological therapy:



clearly indicates that the origin is from the atrial appendage

Carto 3D mapping radiofrequency ablation

Consider surgery if radiofrequency ablation fails or recurs

Radiofrequency Ablation (RFA)

The possible reasons for AAT recurrence after ablation :

- The shape of the atrial appendage make it difficult for the ablation catheter to reach the precise site .
- The wall of the atrial appendage is thin, high power and long duration impossible in RFA.
- Enough ablation energy cannot be conveyed to the ectopic foci.

Atrial Appendage Resection (AAR)

Guo et al* performed **AAR** for **12** patients with **AAT** after **failed RFA** . With an average follow-up of 3 years, no recurrence, no related complications.

Mature, Safe, Effective

But, **open surgery**, with significant **trauma**

*： Guo Xiao-gang,Zhang Jin-lin,Ma Jian et al. Management of focal atrial tachycardias originating from the atrial appendage with the combination of radiofrequency catheter ablation and minimally invasive atrial appendectomy.[J] .Heart Rhythm, 2014, 11: 17-25.

Shanghai Children's Medical Center experience

In the past 3 years, 10 pediatric patients diagnosed with AAT , with 6 from LAA and 4 from RAA. All underwent Atrial Appendage Resection under VAT.

Case	Gender	Age	Body Weight	Preoperative ECG	NYHA	Localization	Surgery Duration	Hospital Stay	Postoperative ECG	Recurrence
1	M	7	27.5	Paroxysmal AT	II	LAA	1.5	10	Sinus	no
2	M	10	30	Paroxysmal AT	II	LAA	1.5	12	Sinus	no
3	F	8	21	AT	II	LAA	2	13	Sinus	no
4	F	8	32	Paroxysmal AT	IV	RAA	1.5	34	Sinus	no
5	M	8	46	Paroxysmal AT ectopic rhythm	III	RAA	1.75	9	Sinus , IRBBB	no
6	M	10	41	Paroxysmal AT	III	RAA	1.5	12	Sinus	no
7	F	9	29	Paroxysmal AT ectopic rhythm	II	LAA	1.5	13	Sinus	no
8	M	7	19	Paroxysmal AT ectopic rhythm	II	LAA	1.5	10	Sinus	no
9	F	3	15.3	Paroxysmal AT	III	LAA	1.5	13	Sinus	no
10	F	6	21	Paroxysmal AT	II	RAA	1.5	12	Sinus	no

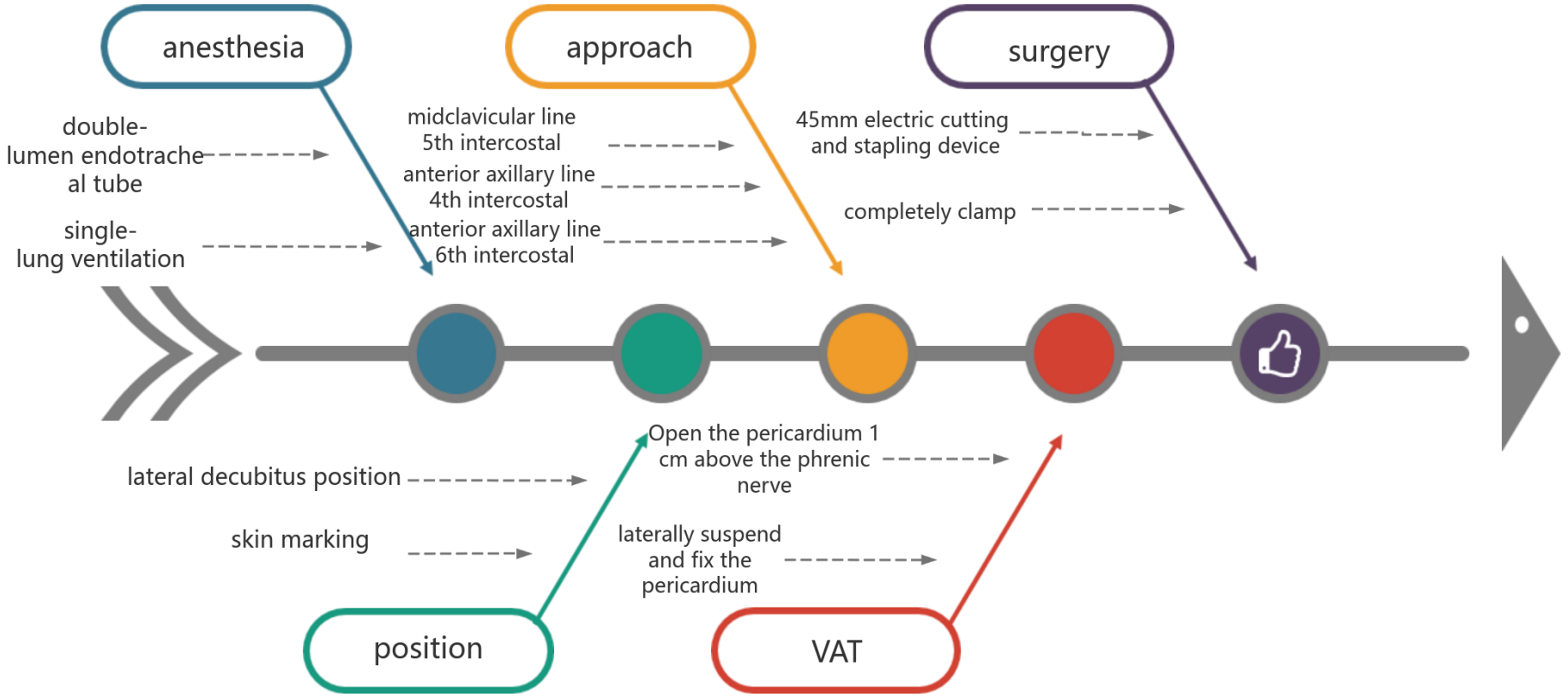
Outcome

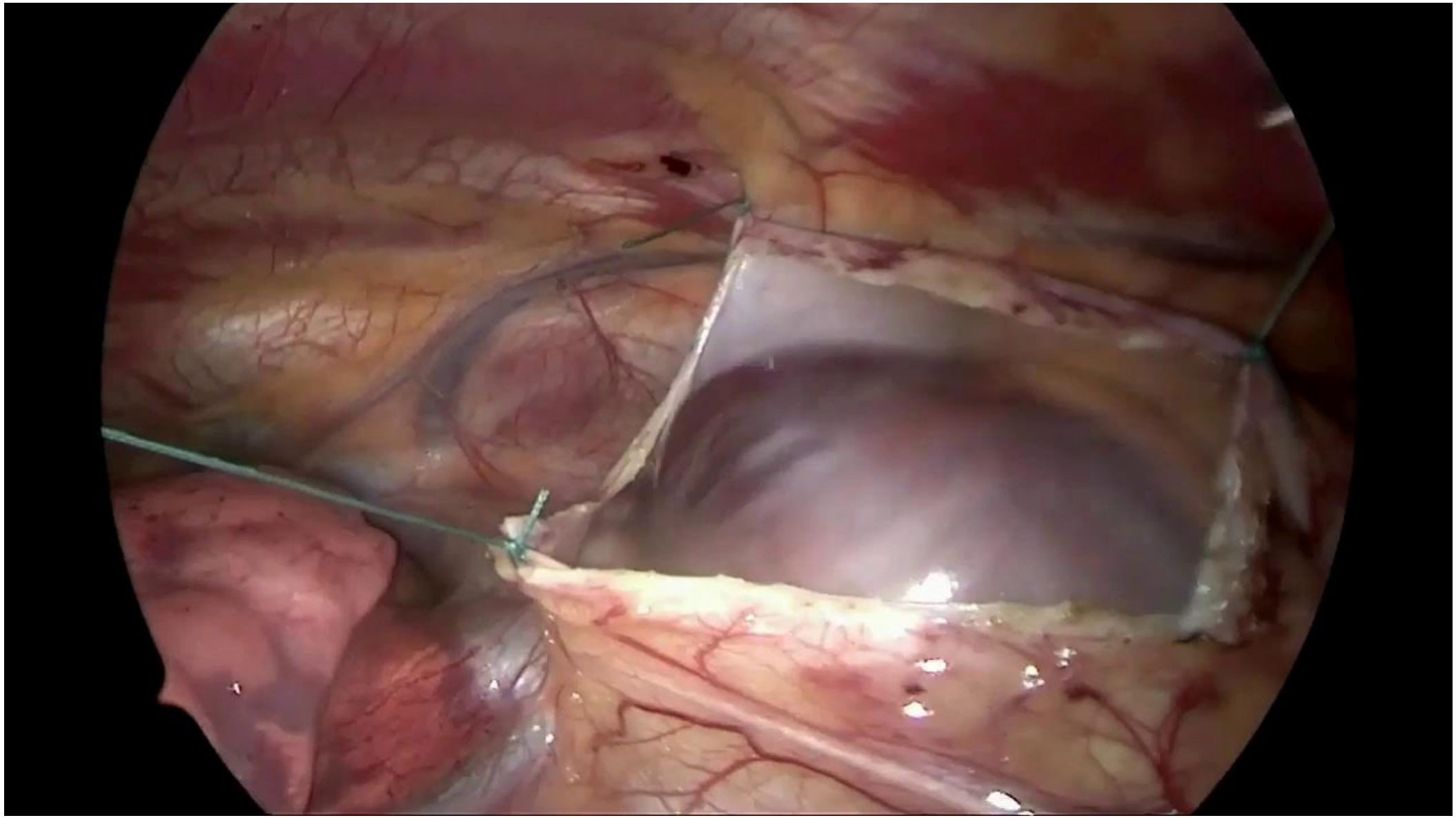
All patients converted to **sinus rhythm** immediately.

Follow-up from 3m to 2y , no recurrence , no deaths, no severe complications were found, with **significant improvement in LVEF, LAD, pro-BNP.**

	LVEF (%)	LAD (cm)	LVDD (cm)	pro-BNP	cardiothoracic ratio
Preoperative	43.36 ± 13.02	2.65 ± 0.53	4.79 ± 0.93	3051 ± 3013	0.62 ± 0.06
Postoperative (3 months)	54.49 ± 20.34	2.18 ± 0.29	4.11 ± 0.93	564.5 ± 496.28	0.53 ± 0.05
P-value	0.007	0.025	0.078	0.004	0.012

VAT of AAR


anesthesia
approach
surgery
double-lumen endotracheal tube
single-lung ventilation
midclavicular line 5th intercostal
anterior axillary line 4th intercostal
anterior axillary line 6th intercostal
45mm electric cutting and stapling device
completely clamp
lateral decubitus position
skin marking
position
Open the pericardium 1 cm above the phrenic nerve
laterally suspend and fix the pericardium
VAT



Key Points

- Preoperative preparation and anesthetic management：double-lumen endotracheal intubation, transesophageal echocardiogram (TEE), external defibrillator pads.
- position and approach：lateral decubitus position，3-ports, MC 5th ICS, AL 4th ICS, AL 6th ICS.
- Circulatory management：Use vasoactive medications maintain MAP above 50,use amiodarone and atropine to decrease the heart rate.

Key Points

- Make an **pericardial incision 1 cm above** the phrenic nerve, parallel to the direction of the phrenic nerve. Suspend the pericardium laterally.
- **TEE** is used to measure the dimension at the base of the atrial appendage.
- Appropriate **size** of **cutter-stapler**, avoid damaging surrounding tissues.
- It is recommended that the child's **weight >10 kg.**
- **Emergency rescue** for accidental **bleeding**, emergency thoracotomy or sternotomy, cardiopulmonary bypass standby.

Conclusion

- Atrial appendage resection is an ultimate surgical treatment for refractory atrial tachycardia originating from atrial appendage.
- Compared with traditional thoracotomy approach, VAT atrial appendage resection is safe and effective with less trauma in children.

THANK YOU

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