MANAGEMENT OF PERIOPERATIVE ISCHAEMIC EVENT IN ASO

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DISCLOSURE

Nothing to disclose

0UTLINE OF THIS TALK

- What is “perioperative ischaemic event in ASO”?
- Arterial switch operation (ASO)
- Predisposing factors and causes
- Recognition and Detection of the event
- Management
- Conclusion

What is “perioperative ischaemic event in ASO”? (I)

- “Perioperative” means “**relating to, occurring in, or being the period around the time of a surgical operation.**”
- 3 phases of surgery
  - Preoperative
  - Intraoperative
  - Postoperative

What is “perioperative ischaemic event in ASO”? (II)

- “Ischaemic event” is usually referred to myocardial ischaemic from coronary arterial occlusion.
- Osteal stenosis
- Coronary kinking
- Inadequate mobilisation
  - Stretching on coronary artery
  - Compression at the junction of mobilised and epicardial parts
- Compression by surrounding structures

What is “perioperative ischaemic event in ASO”? (III)

- Preoperative factors related to
  - Type of coronary artery
- Intraoperative factors related to
  - Surgical technique
- Postoperative factors related to
  - Postoperative care and management of the event

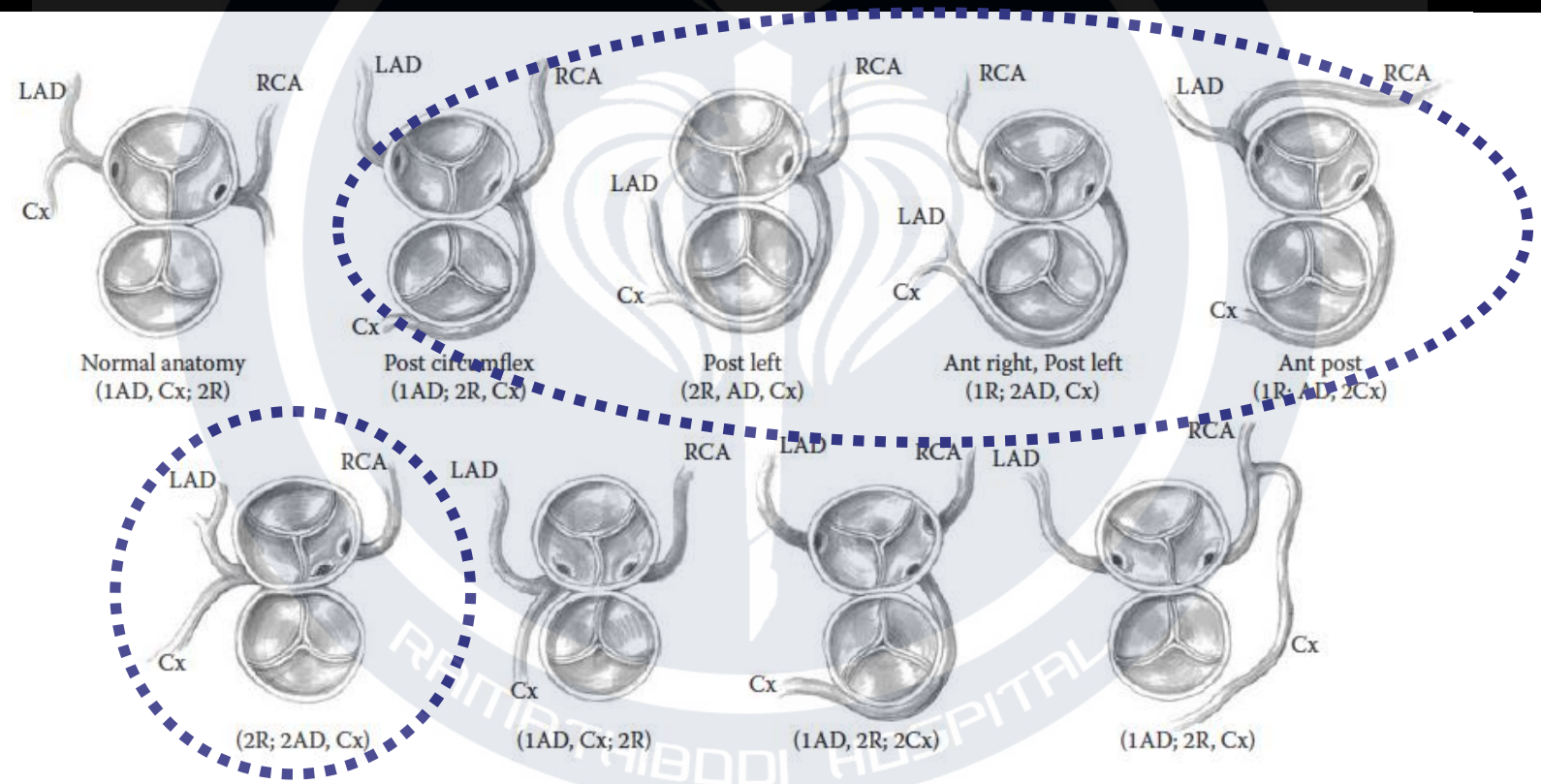
Arterial switch operation (ASO)

- Critical point is

Failure of coronary transfer (translocation)

- Special attention on
  - Type of coronary artery
  - Surgical technique
  - Surrounding structures

Predisposing factors and Causes: Type of coronary artery



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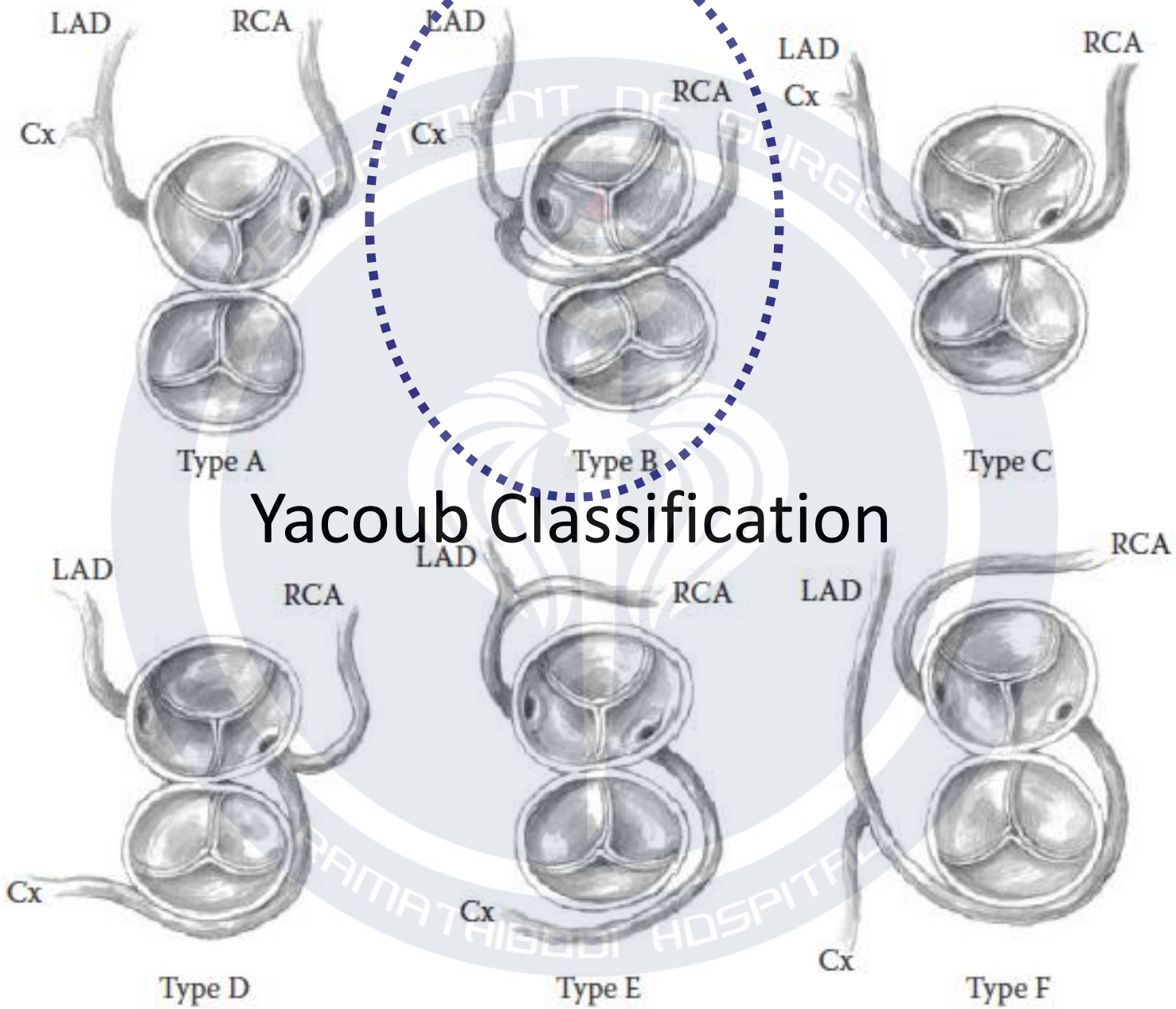
Yacoub Classification



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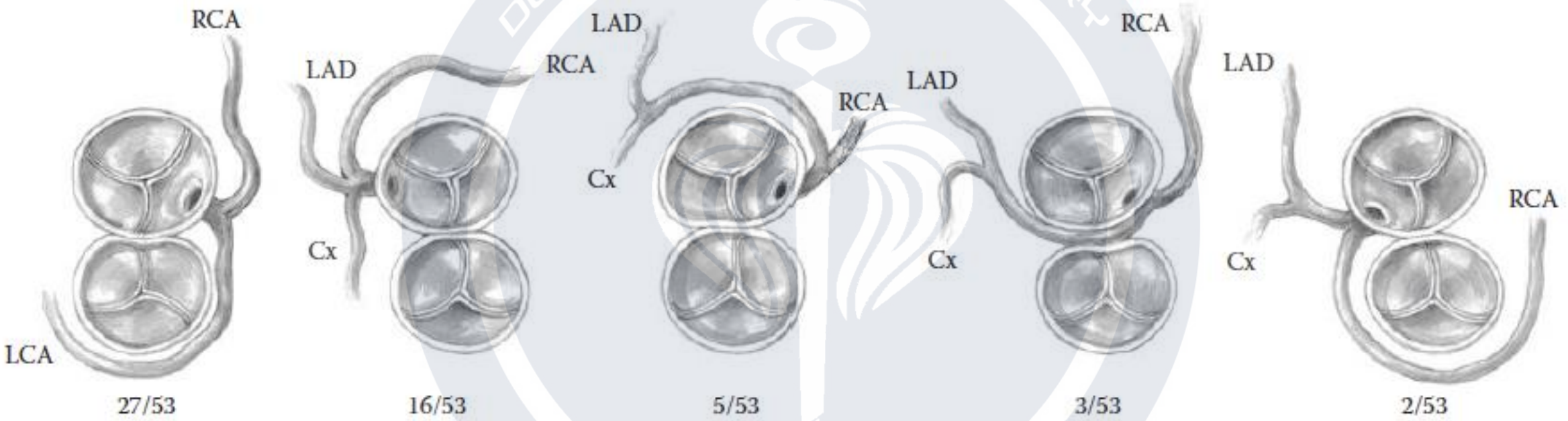
Single coronary artery



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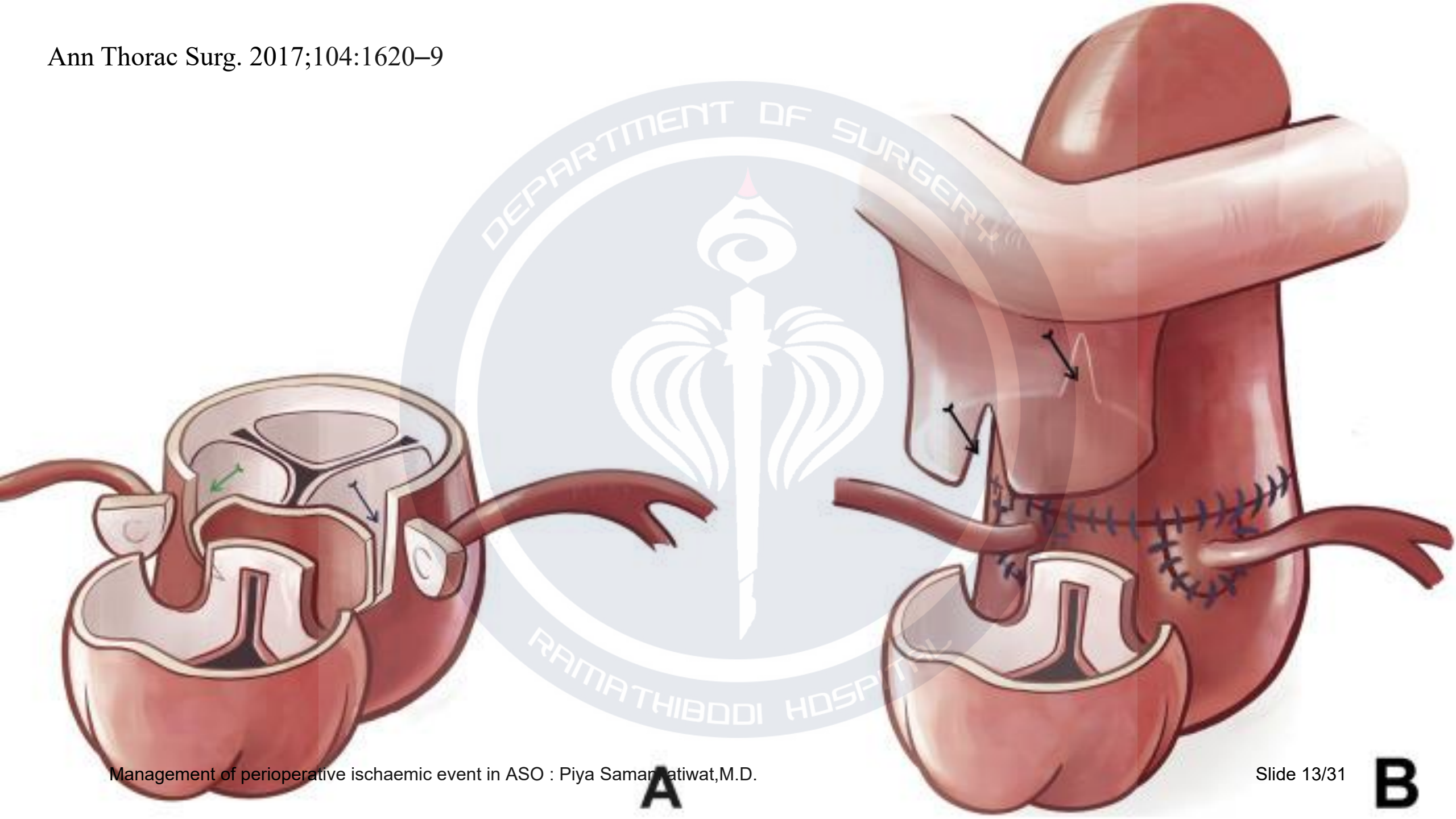
Predisposing factors and Causes: Surgical technique

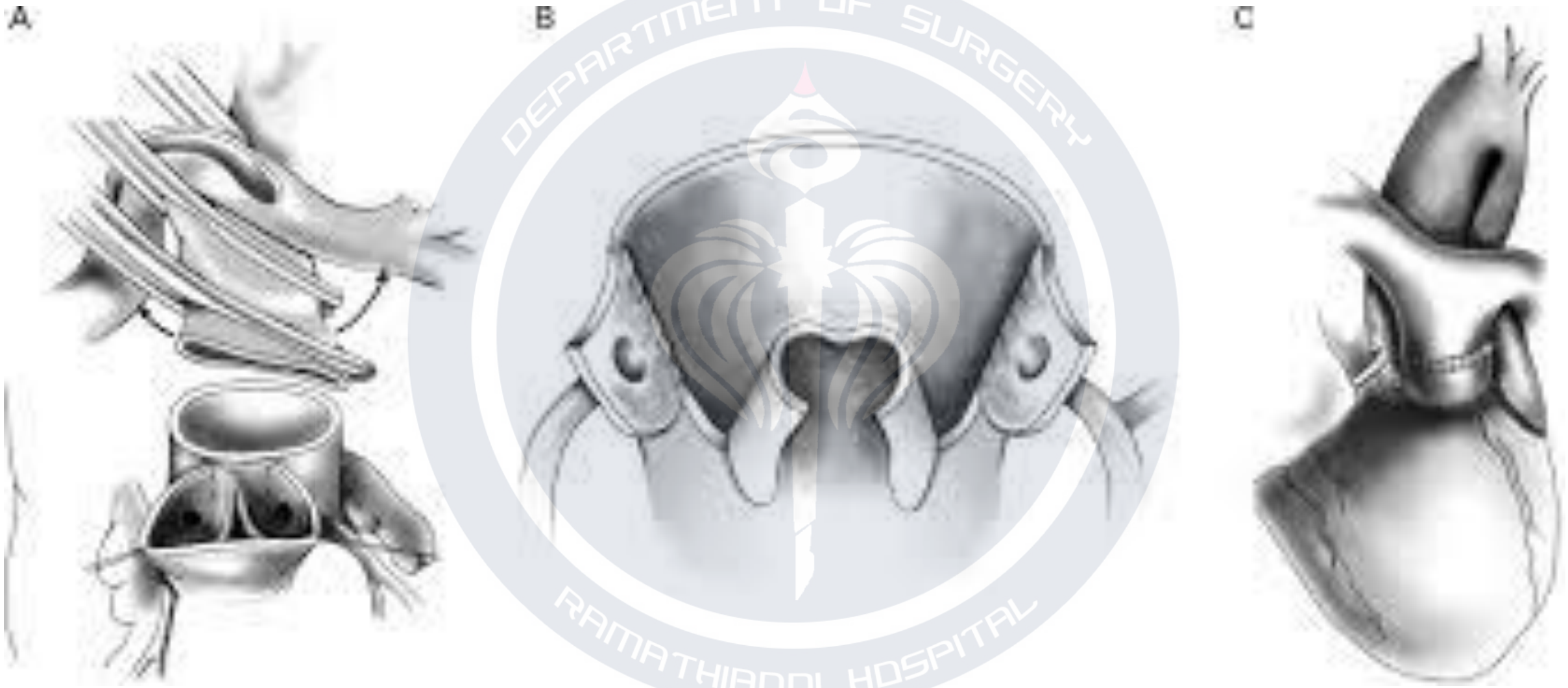
- Coronary transfer technique
- Standard technique consists of
  - Creation of coronary button
  - Trapdoor (Cr- Roger Mee)
  - Closed technique

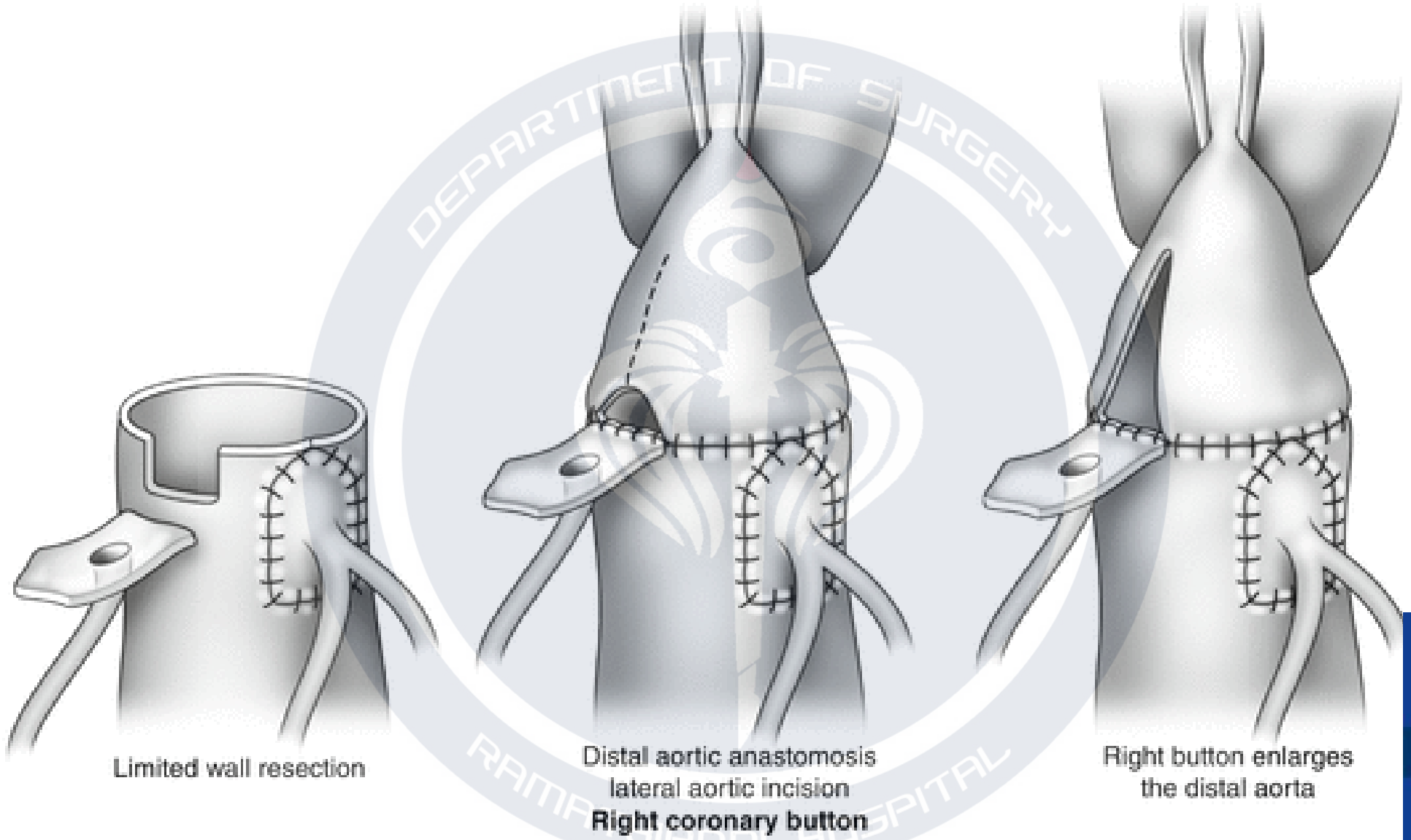
TRAPDOOR CORONARY TRANSFER

- Pulmonay trunk transected as distally as possible
- Coronary artery will be transferred by creating a trapdoor flap in neoaorta
- This will prevent too far implantation of coronary button on right-lateral aspect of neoaorta
- Coronary button is also positioned more cephalad than in usual case

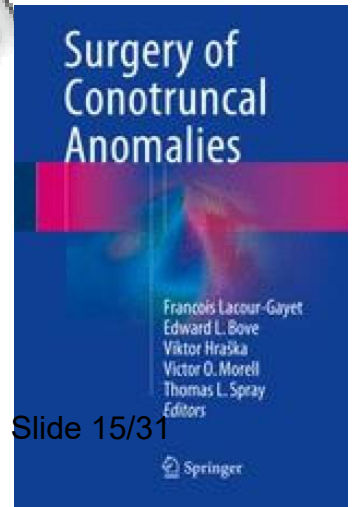
Ann Thorac Surg. 2017;104:1620–9

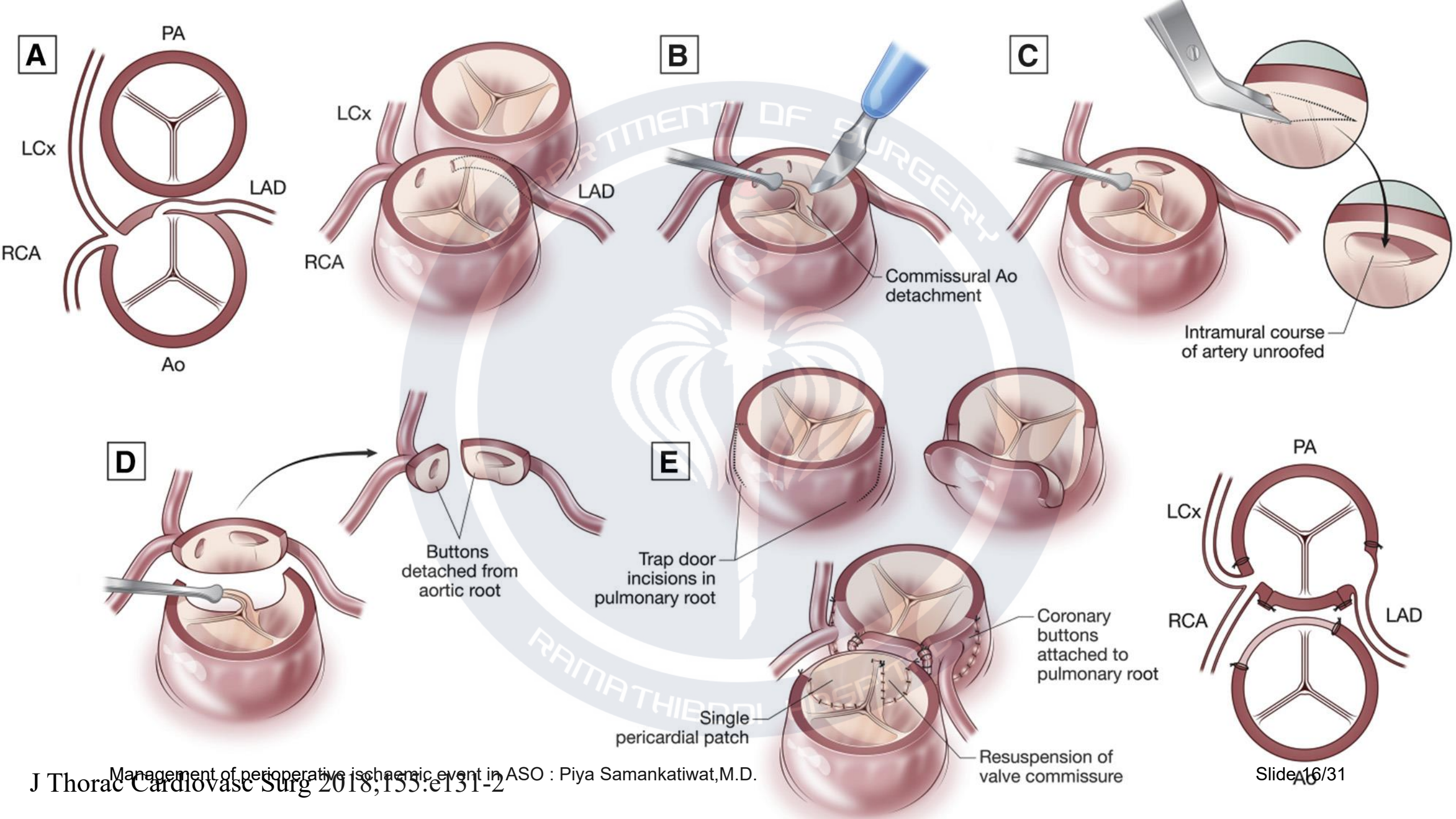






Lacour-Gayet F. (2016) Arterial Switch in TGA-IVS: Coronary Transfer. In: Lacour-Gayet F., Bove E., Hraška V., Morell V., Spray T. (eds) Surgery of Conotruncal Anomalies. Springer, Cham. https://doi.org/10.1007/978-3-319-23057-3_14





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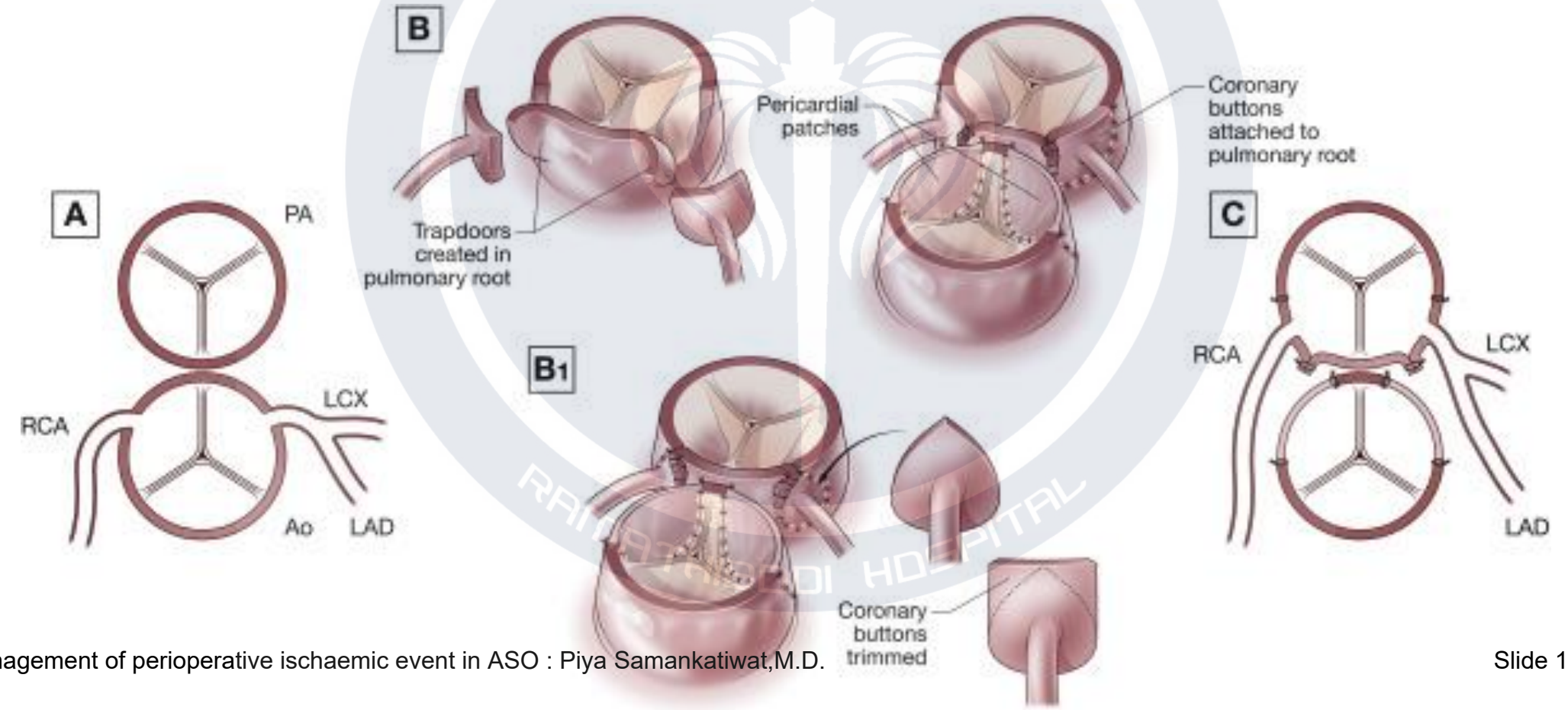
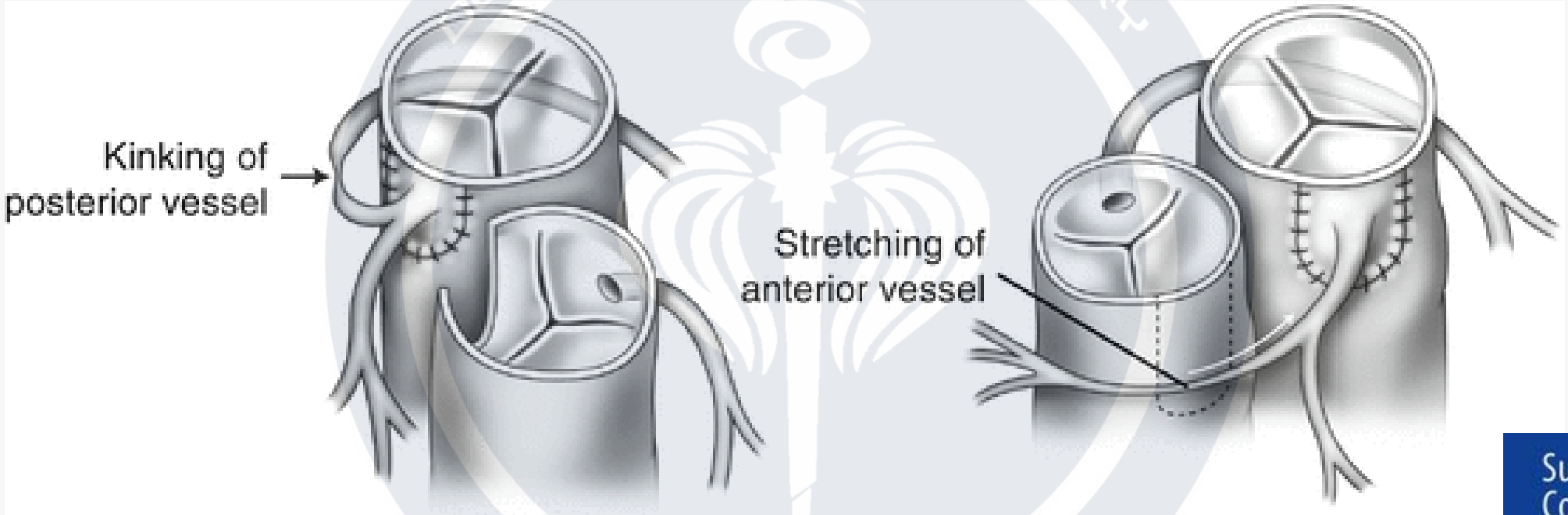
Predisposing factors and Causes: Surrounding structures





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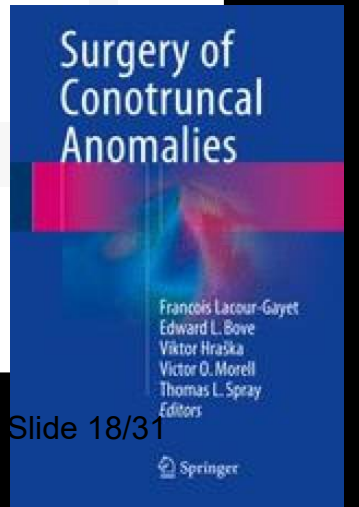
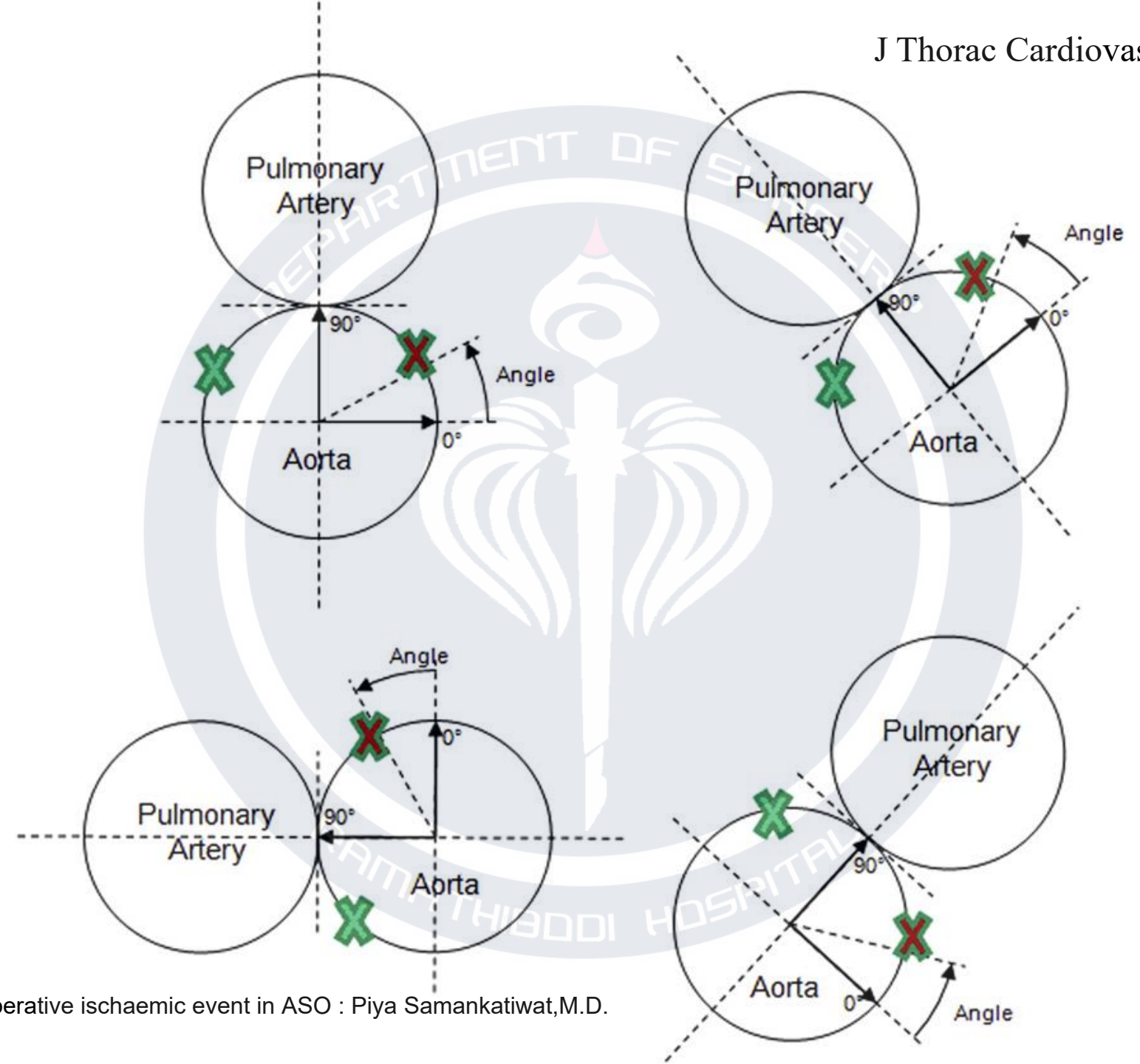


Predisposing factors and Causes: Surrounding structures

- Constructing the overlying pulmonary artery anastomosis.
- It is important to avoid a tightly draped main or right pulmonary artery which can compress the coronaries at their origin.

MECHANISM OF PERIOPERATIVE ISCHAEMIC EVENT IN ASO


Pulmonary Artery
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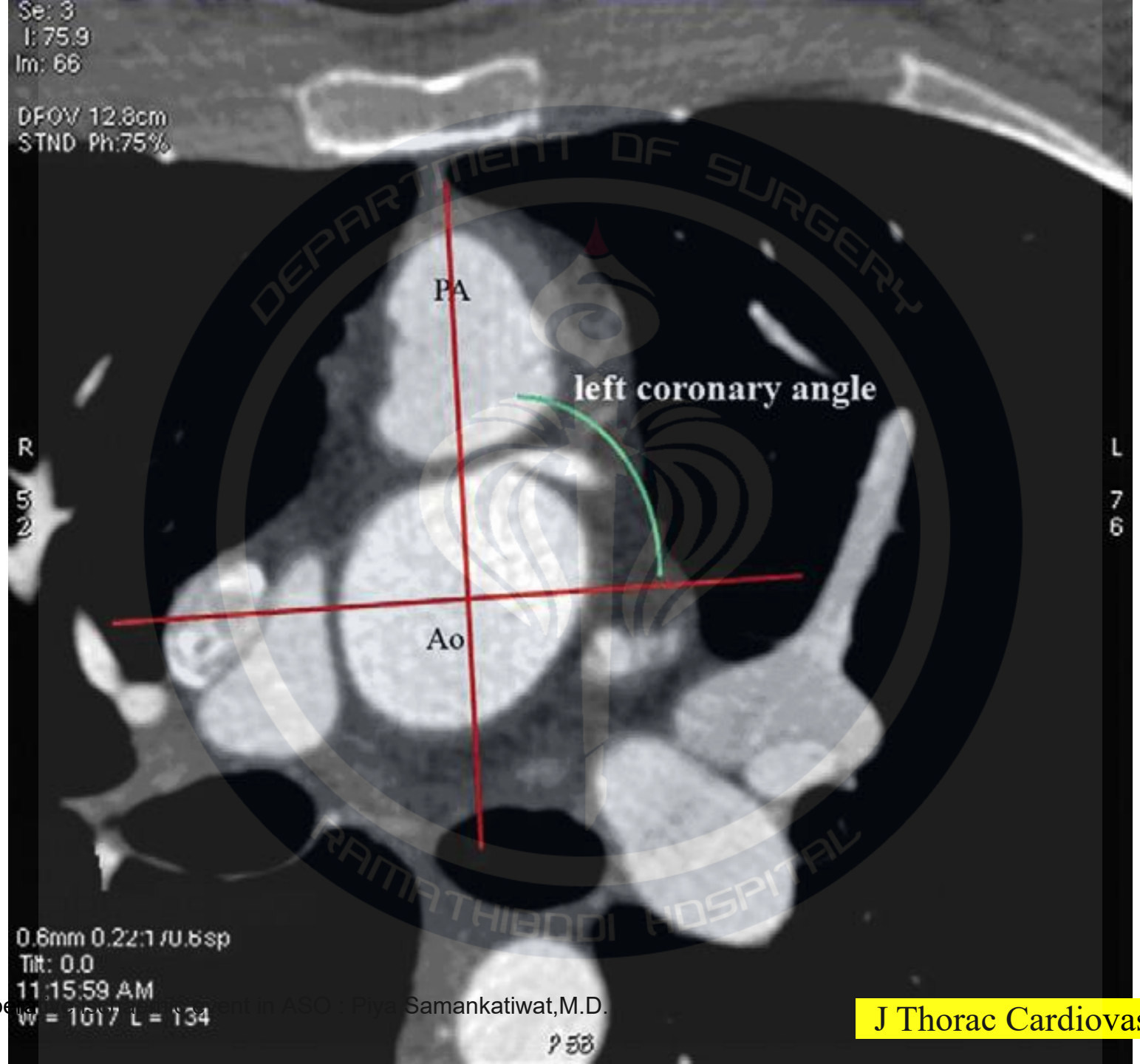
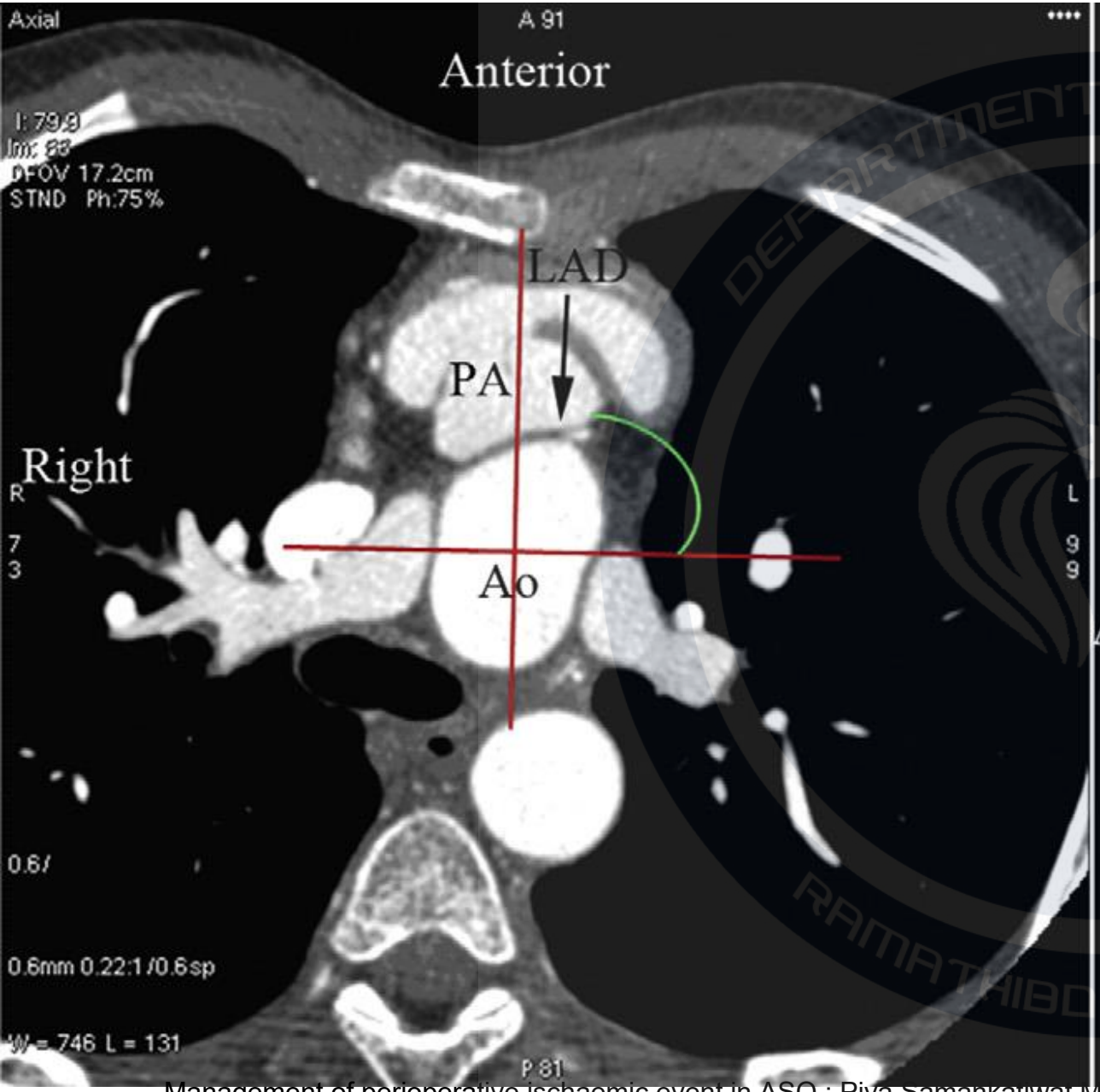
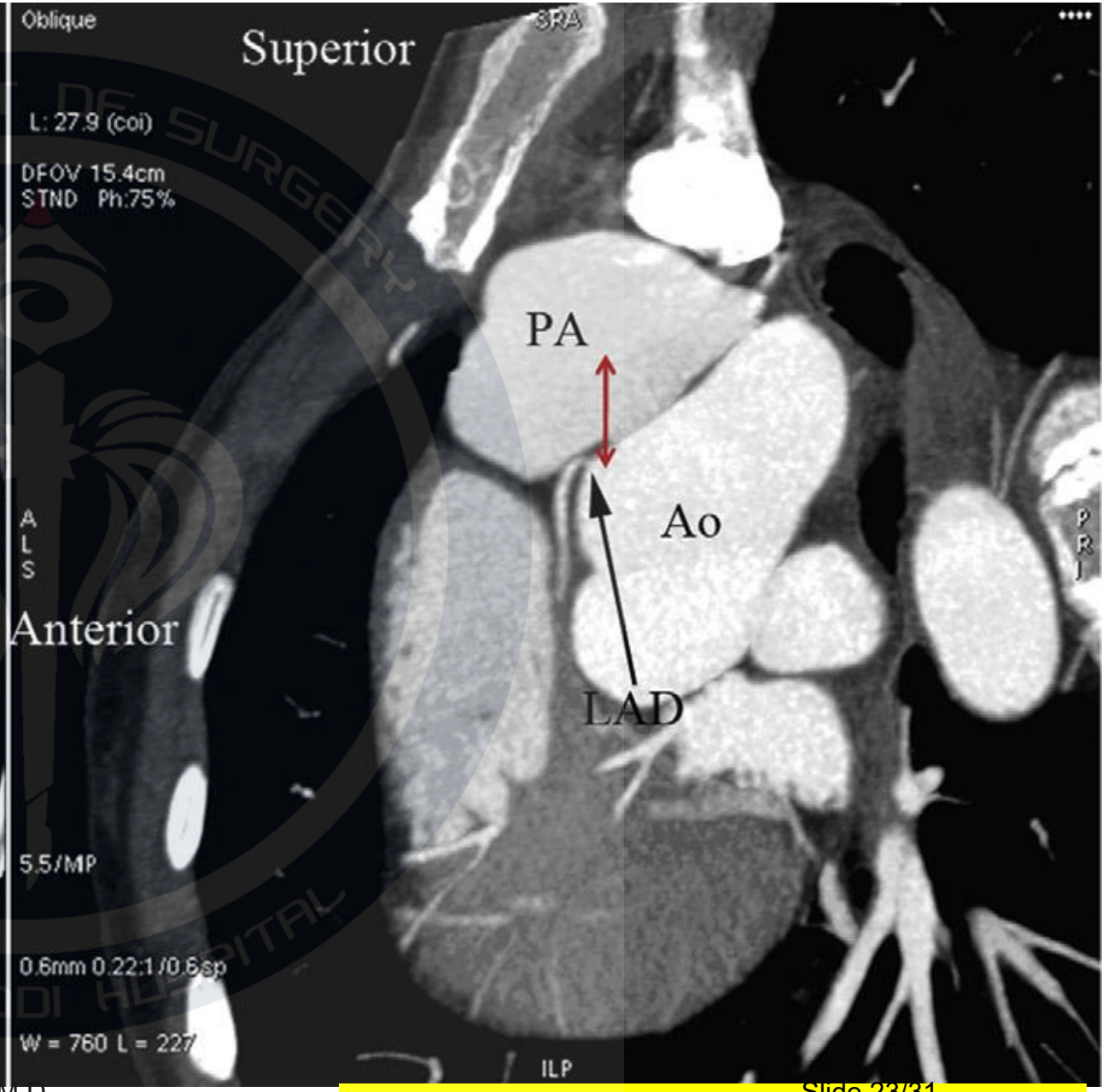


J Thorac Cardiovasc Surg 2013;145:1263-9





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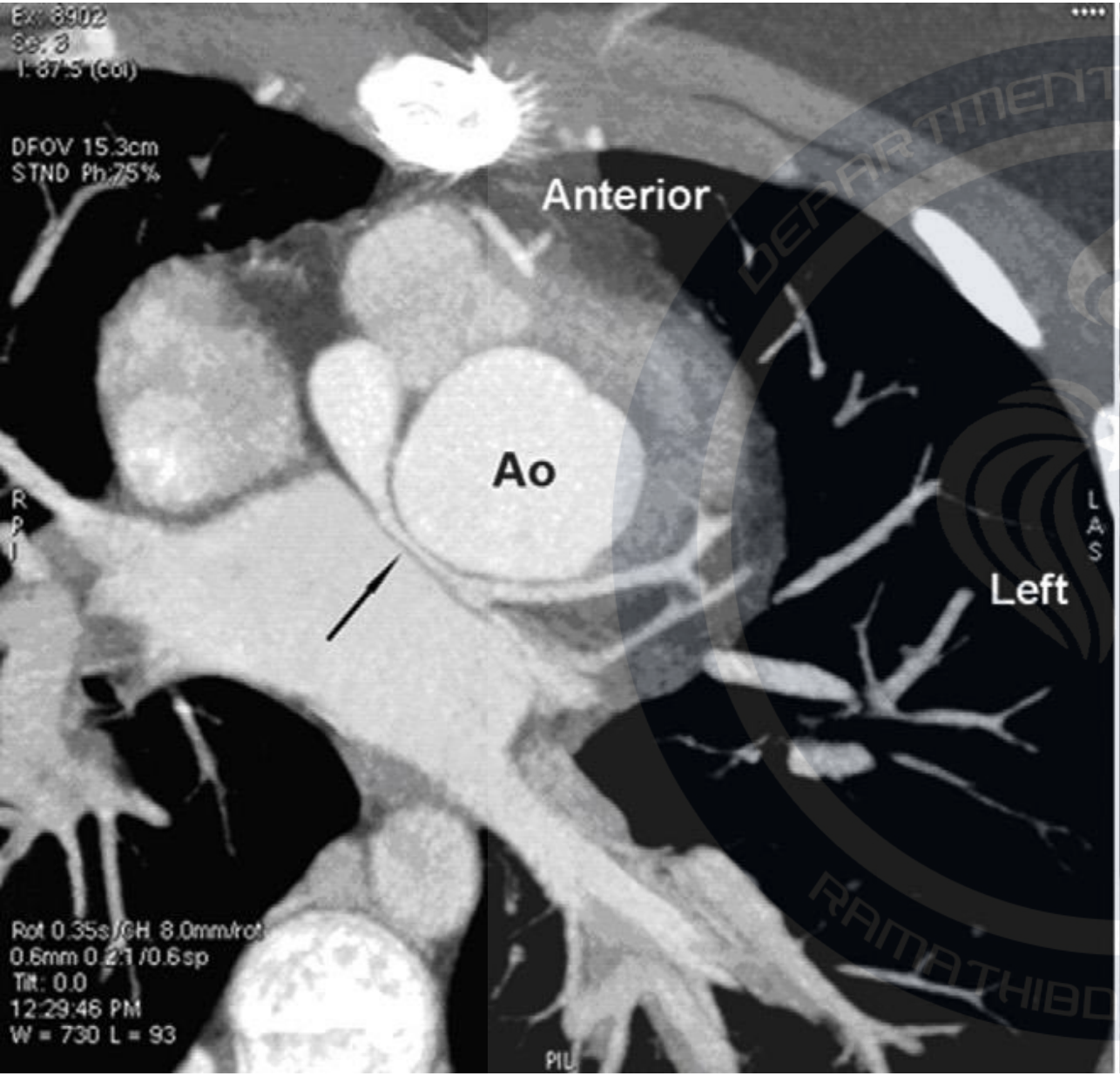

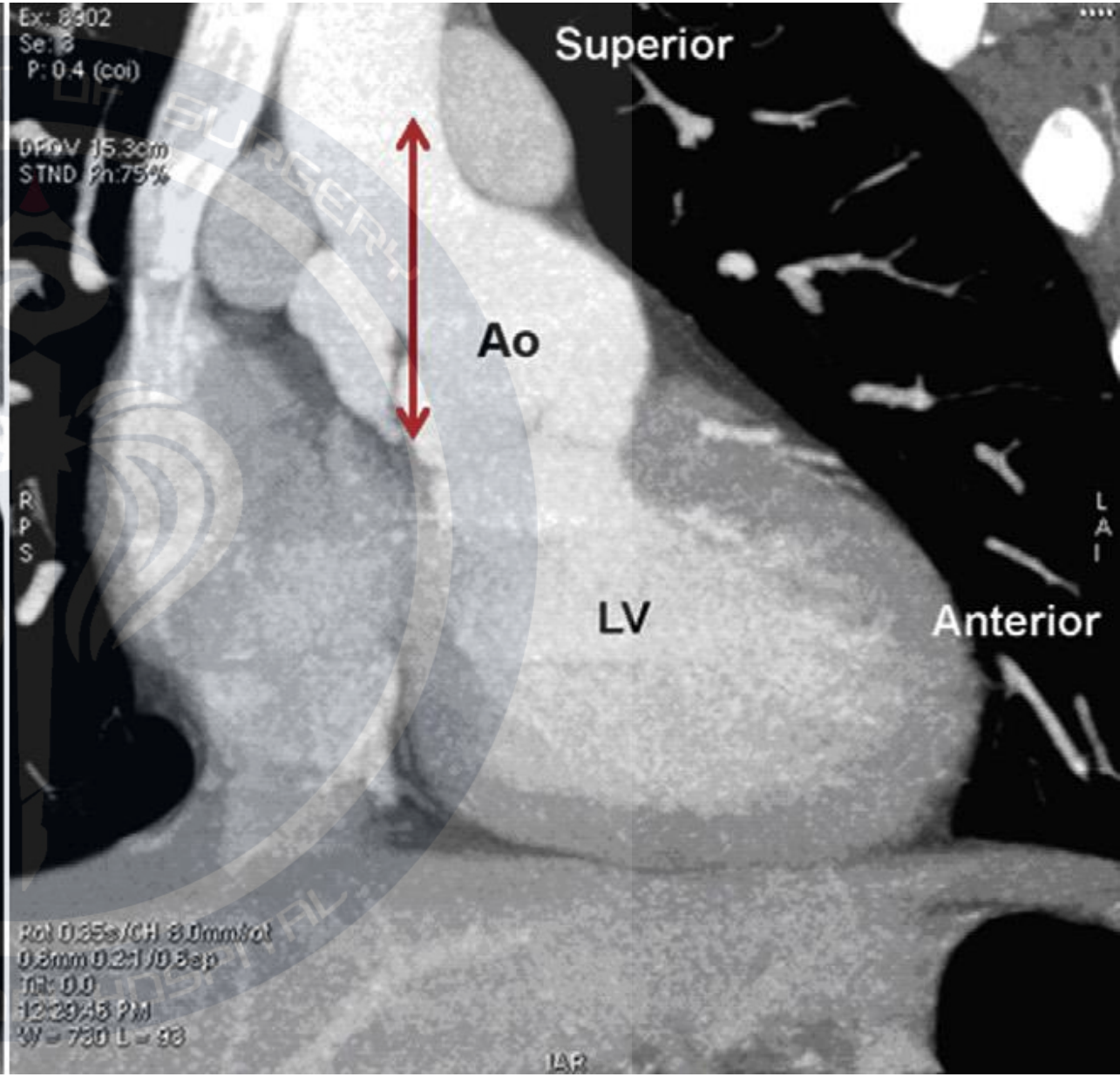

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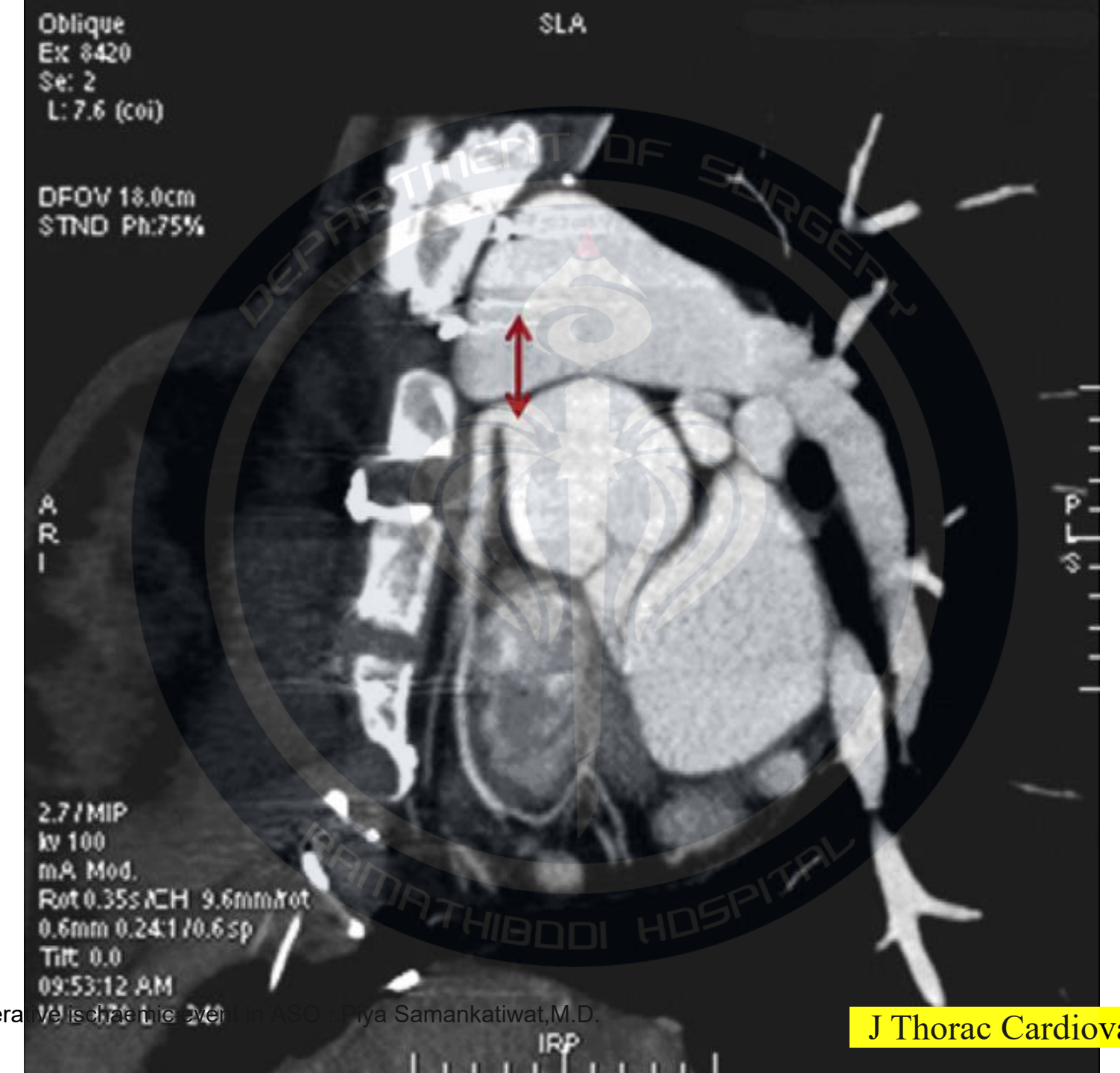

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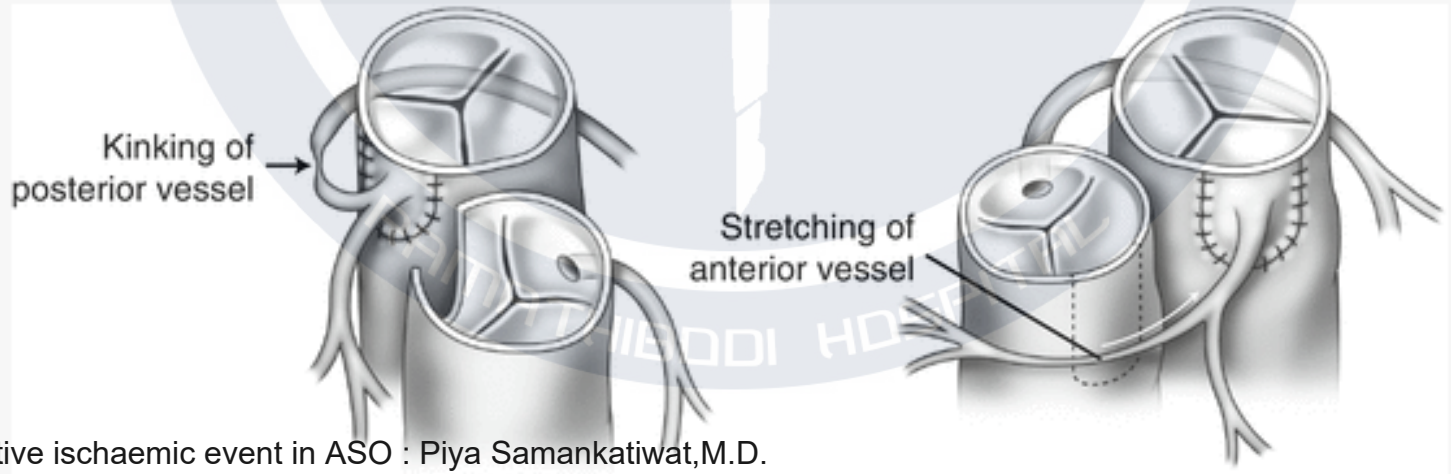
Recognition and detection

- Identify coronary artery pattern at risk, e.g. single coronary from sinus 2, hence 2RLCx
- Intraoperative recognition
  - Poor LV contraction
  - Apex of the heart points out of the chest and may completely emerge from the chest cavity.
  - Frothy sputum or pulmonary haemorrhage
- Postoperative change of EKG and troponin-T level

Management: intraoperative

- Intraoperative management of the encounter
  - Further mobilisation for kinking or stretching
  - Redo coronary transfer or reposition the button



Management: intra-operative

- Breaking the “Positive feedback loop” is sometimes really difficult. Plus myocardial oedema.
- More mobilise the left main coronary artery.
- Reposition the left coronary button.
- Prevention is the most appropriate management.

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Management: postoperative

- ECMO to buy time for decision making.

Management: Prevention

- Planning for coronary transfer for any specific coronary pattern is the most important step.

Pre-Operative Check List for an Arterial Switch in TGA-IVS

[ ] Coronary anatomy defining: simple and complex coronary patterns.
[ ] Absence of significant VSD (>3 mm)
[ ] Absence of aortic arch obstruction
[ ] Absence of LVOT obstruction
[ ] Absence of intra-cranial bleeding
[ ] Absence of ongoing feto-maternal infection

Conclusion

- Ischaemic event in ASO is a specific devastating condition.
- Recognition and proper management is crucial to determine outcome.
- However, it is extremely difficult to handle.
- Prevention is the best management. Planning of coronary transfer strategy is crucial. Identification of a particular coronary artery pattern and selection of an appropriate coronary transfer technique is the most important step.