ANGIOPLASTY SUMMIT
TCTAP 2012
TRANSCATHETER CARDIOVASCULAR THERAPEUTICS ASIA PACIFIC
17th April 24-27, 2012
Seoul, Korea
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Acute Limb Ischemia Following TEVAR in Patient with Anomalous Origin of Left Vertebral Artery

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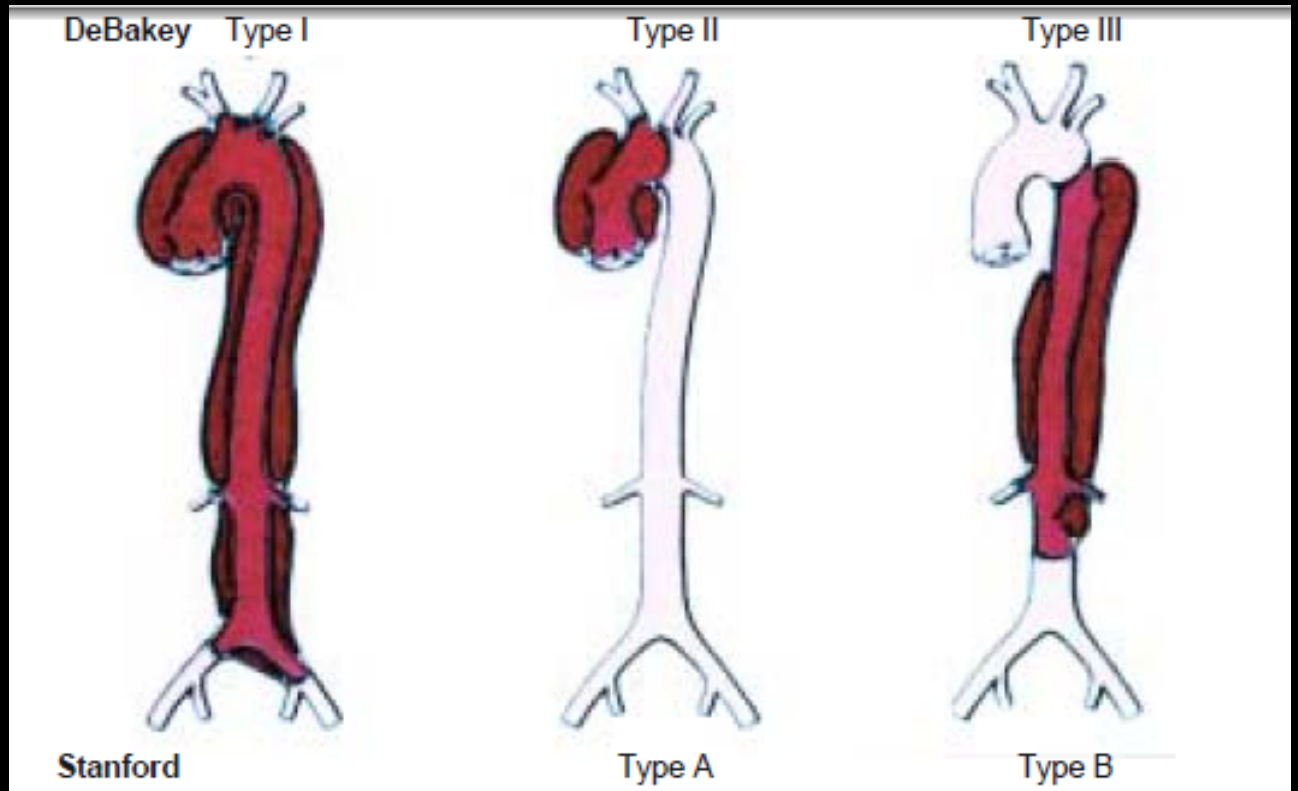
Classification of Aortic Dissection



DeBakey

Type I	Originates in the ascending aorta, propagates at least to the aortic arch and often beyond it distally
Type II	Originates in and is confined to the ascending aorta
Type III	Originates in the descending aorta and extends distally down the aorta or rarely retrograde into the aortic arch and ascending aorta

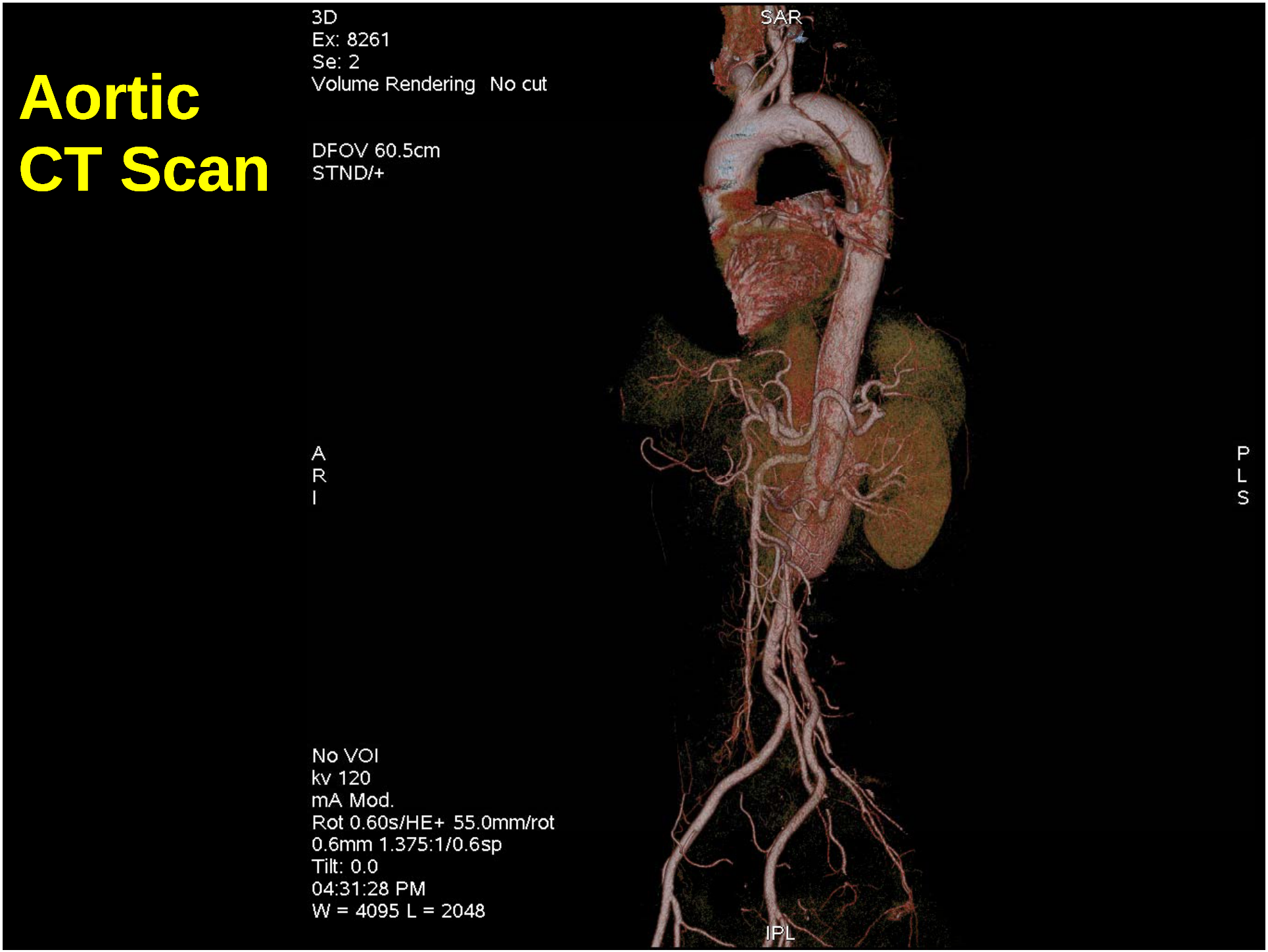
Stanford

Type A	All dissections involving the ascending aorta, regardless of the site of origin
Type B	All dissections not involving the ascending aorta

Case Illustration

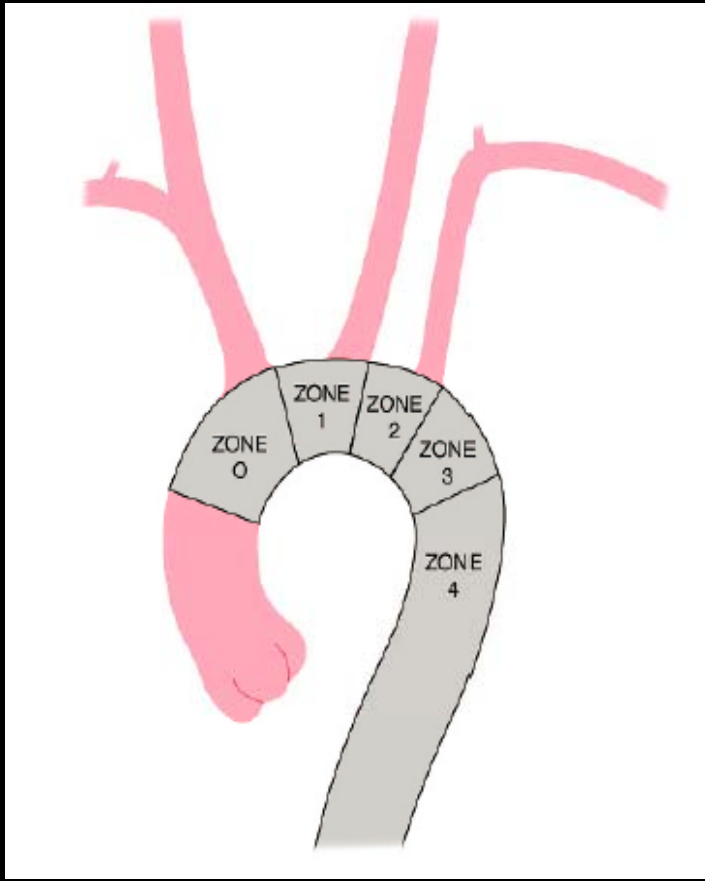
- 51 year-old hypertensive male
- Referred from a private hospital with suspected Acute Aortic Dissection
- Chest pain radiating to the back and Stomach occurred 8 hrs prior to admission

Aortic CT Scan

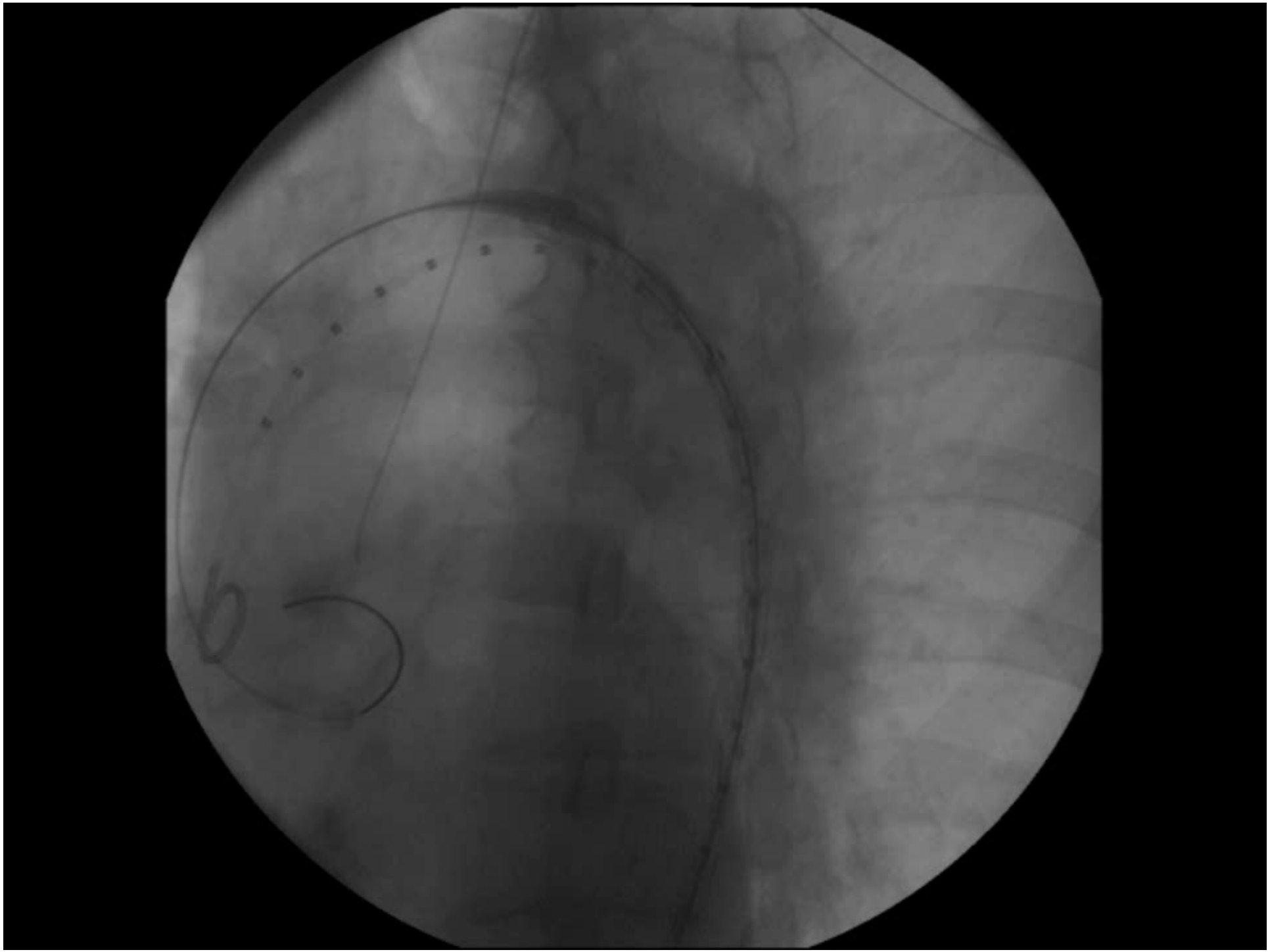


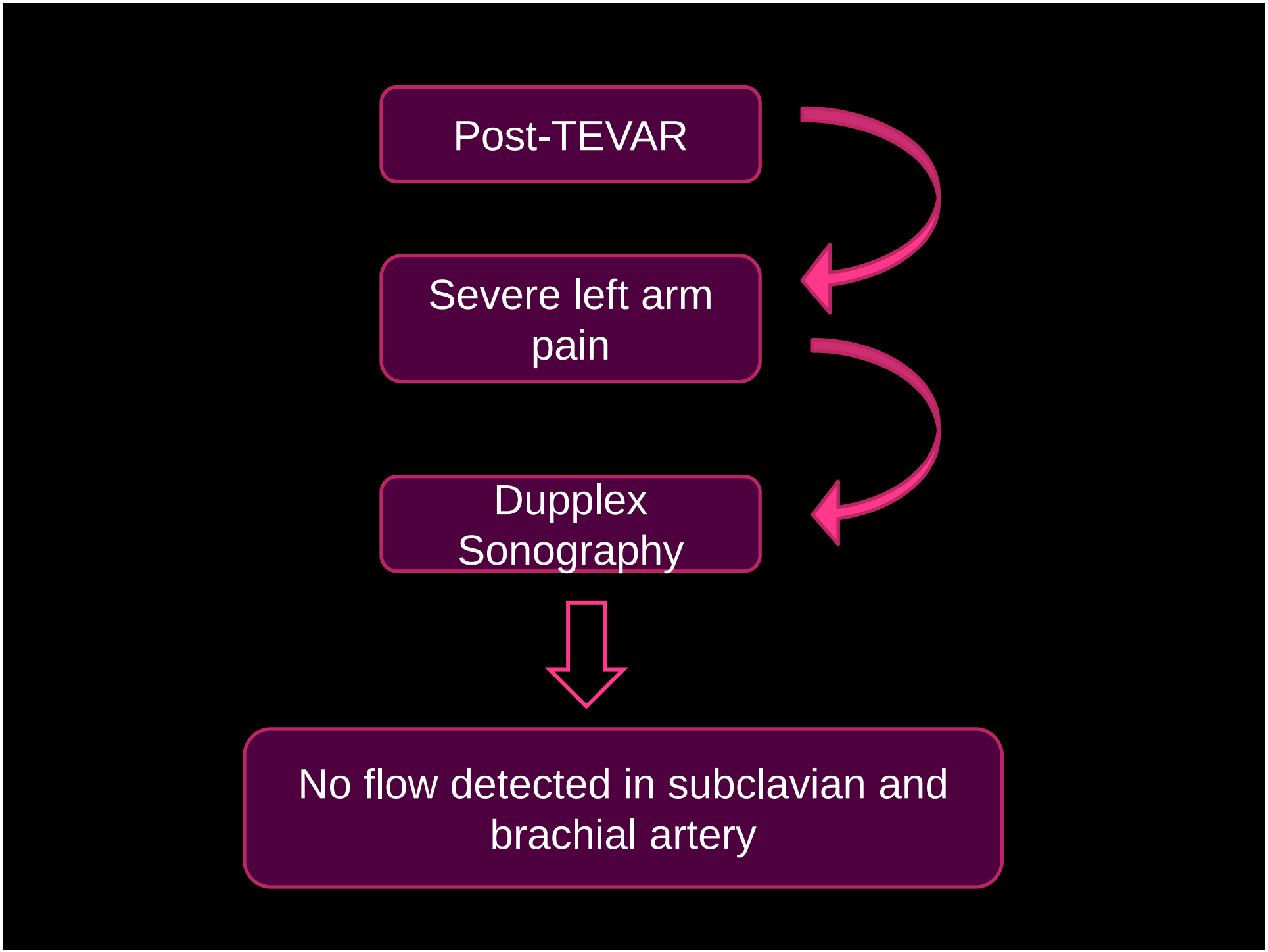
Aortic CT Scan

Plan

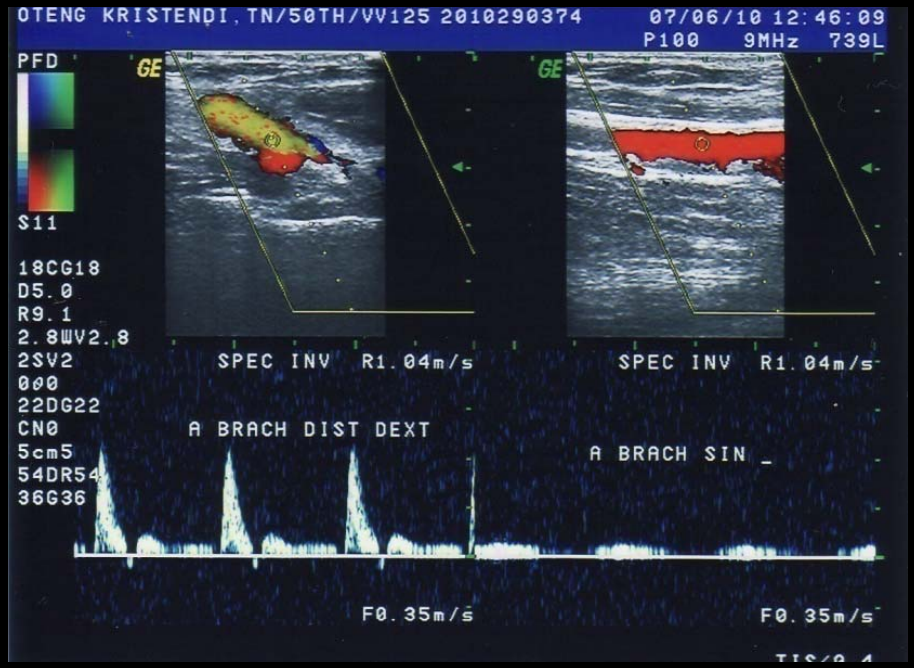


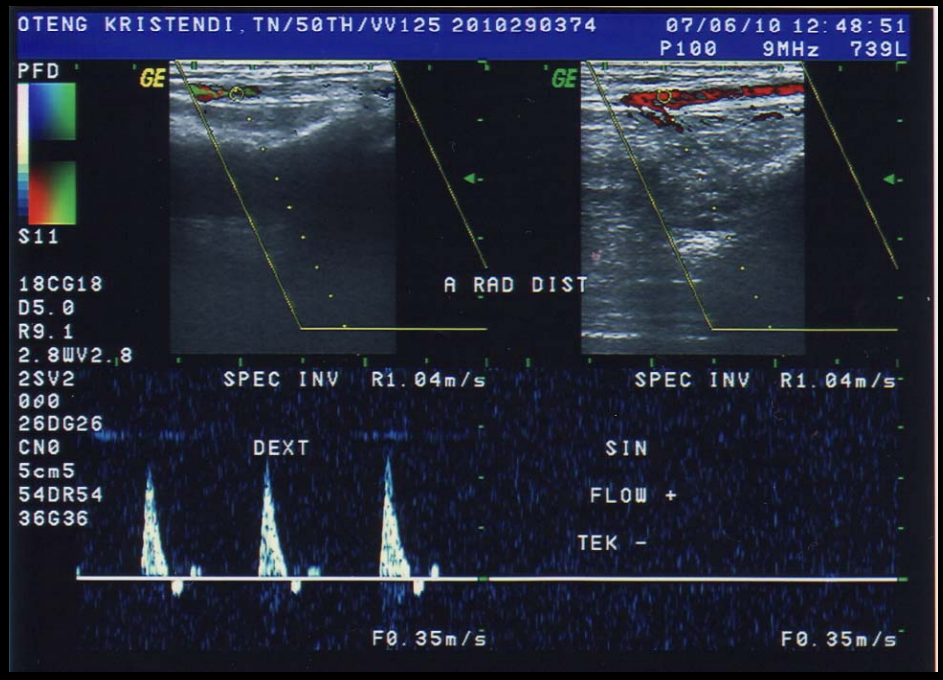
- Thoracic Endovascular Aortic Repair
- Separated Stent Graft System
- Cover the origin of Left Subclavian Artery (LSCA) as a very short landing zone (Zone 2)




Post-TEVAR
Severe left arm pain
Dupplex Sonography
No flow detected in subclavian and brachial artery

Dupplex Sonography

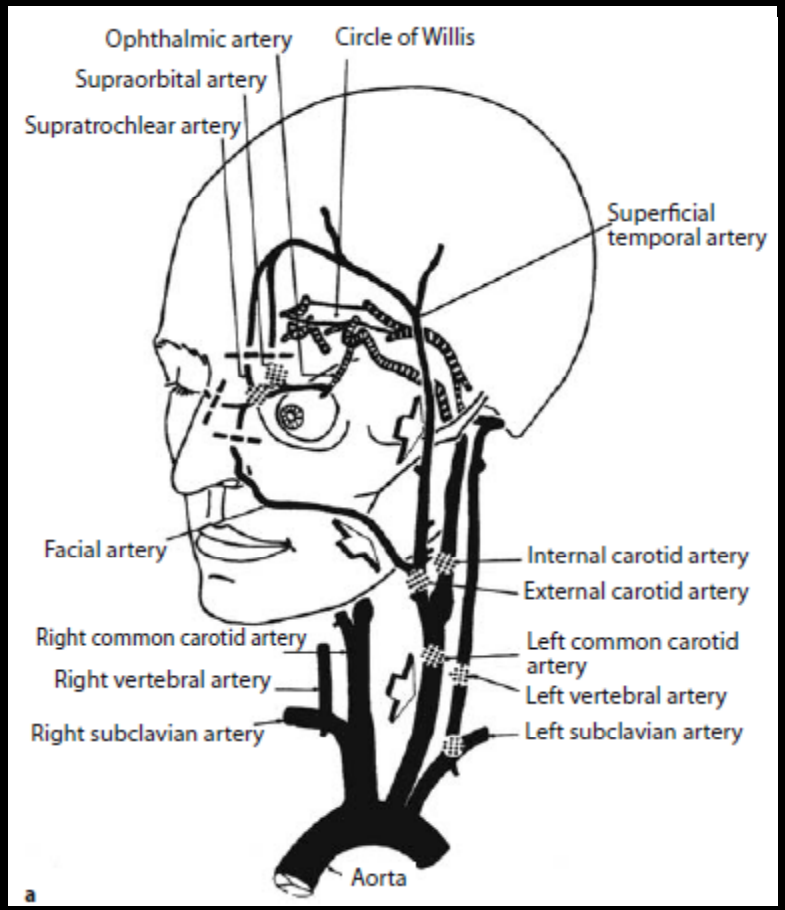


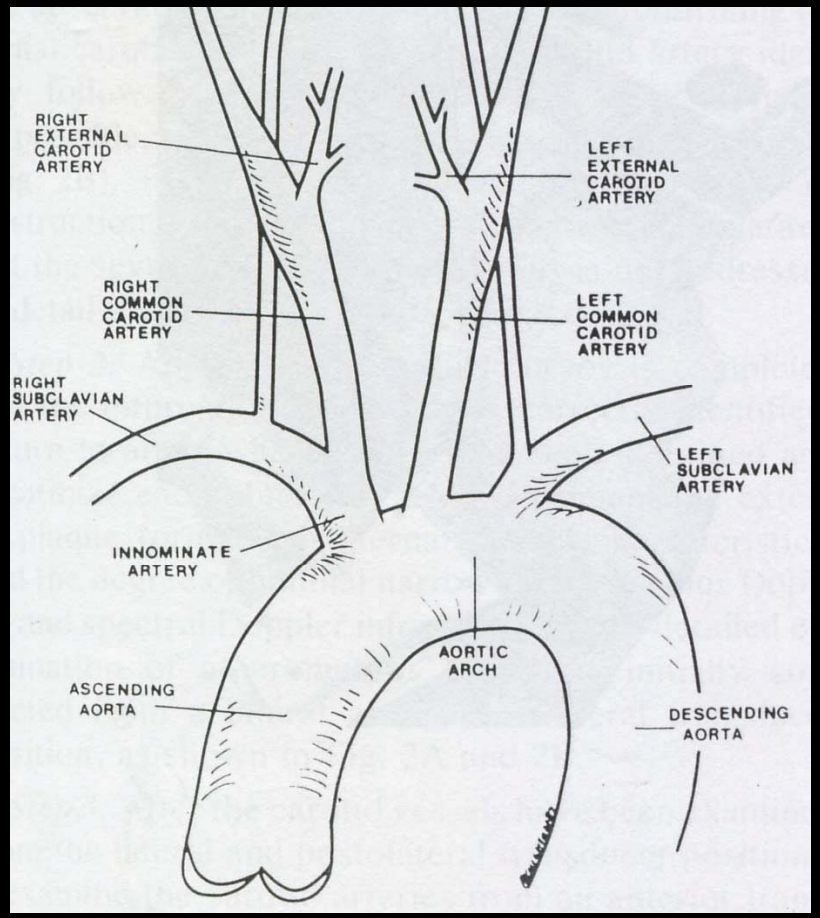


What Actually Happened?

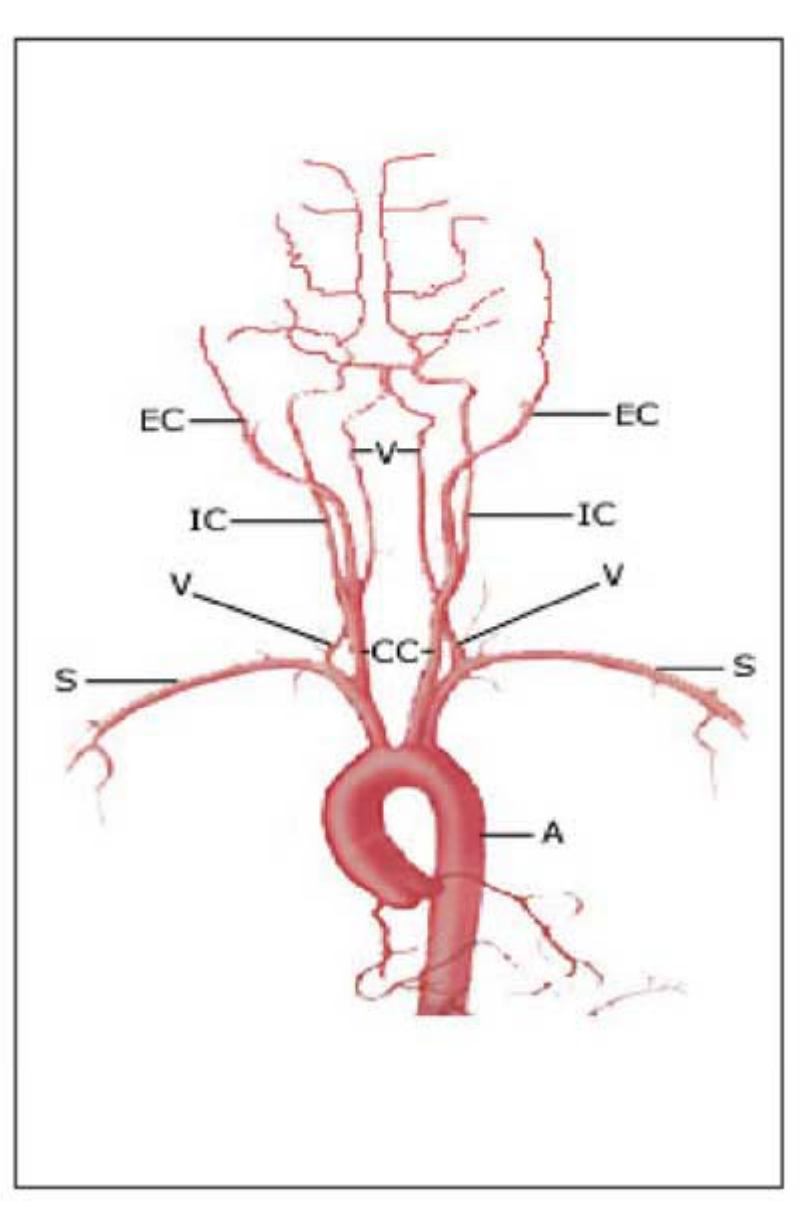
- We fully covered the origin of LSCA
- No Flow (Retrograde Flow) from Left Vertebral Art (LVA) to LSCA!!! As the origin of LVA arose directly from Aortic Arch !!!
- Acute Upper Limb Ischemia occurred
- Emergency revascularization should be done to upper limb……

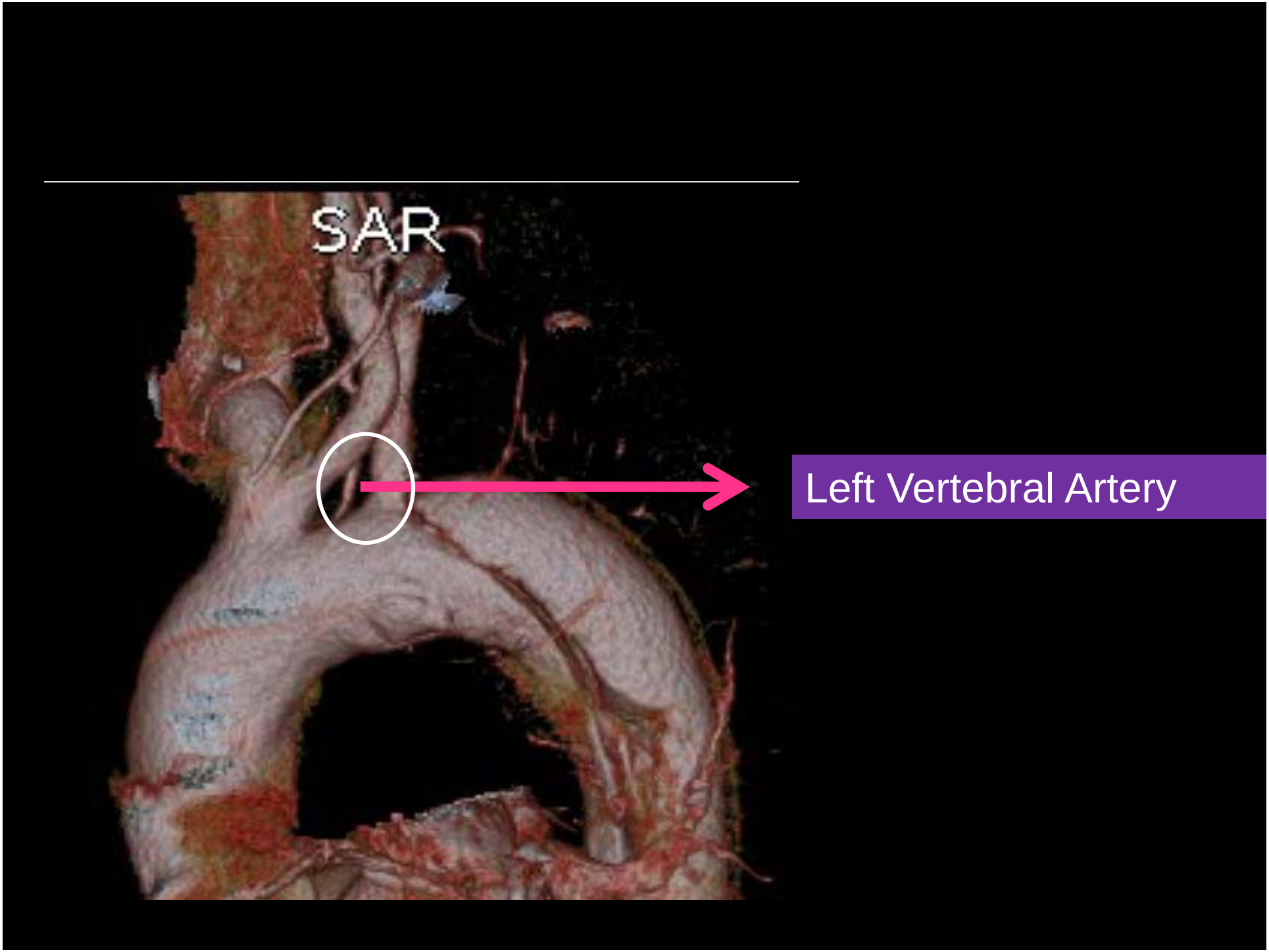
Normal Anatomy



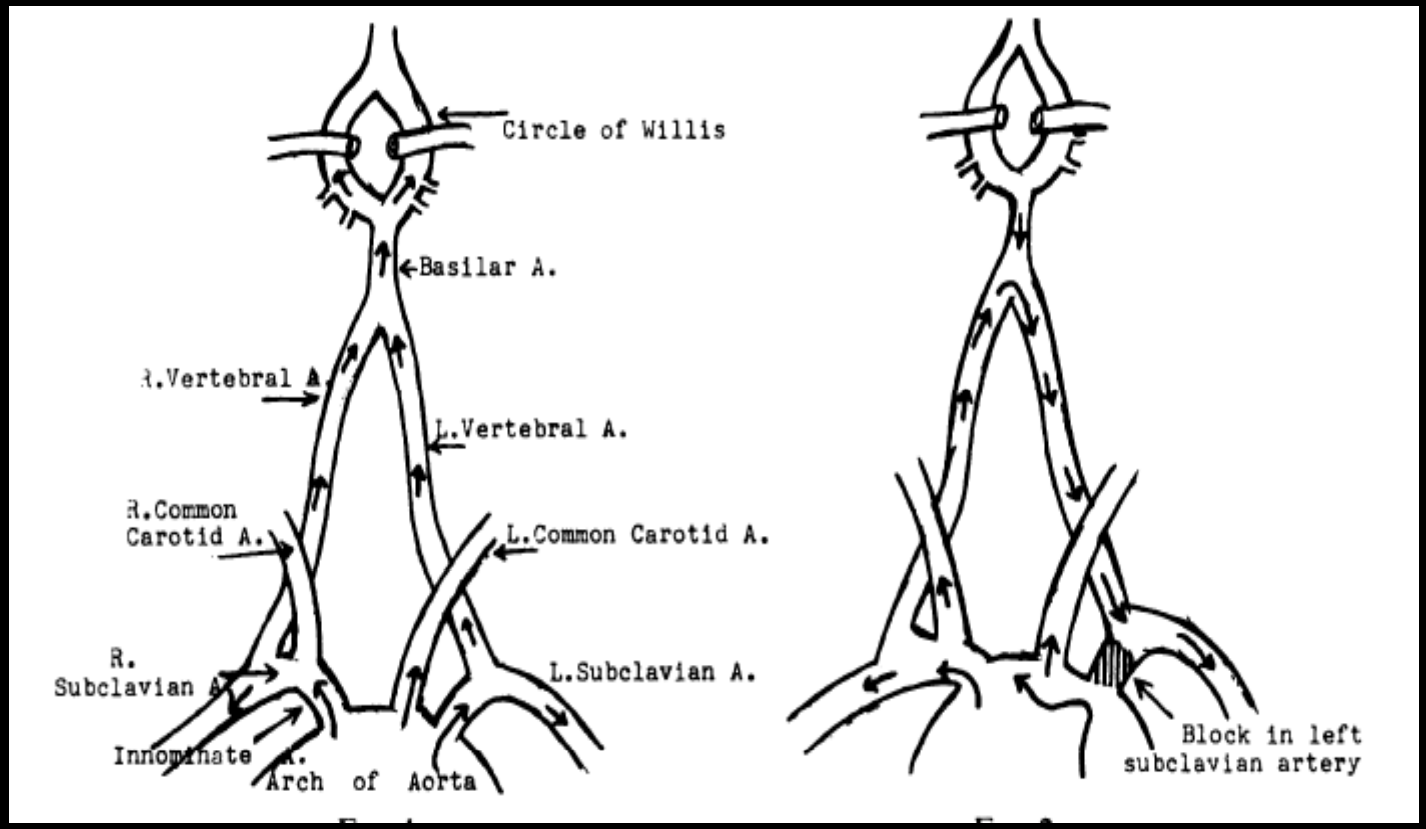


Anomalous of L Vertebral Artery Origin




SAR
Left Vertebral Artery

Subclavian Artery Circulation

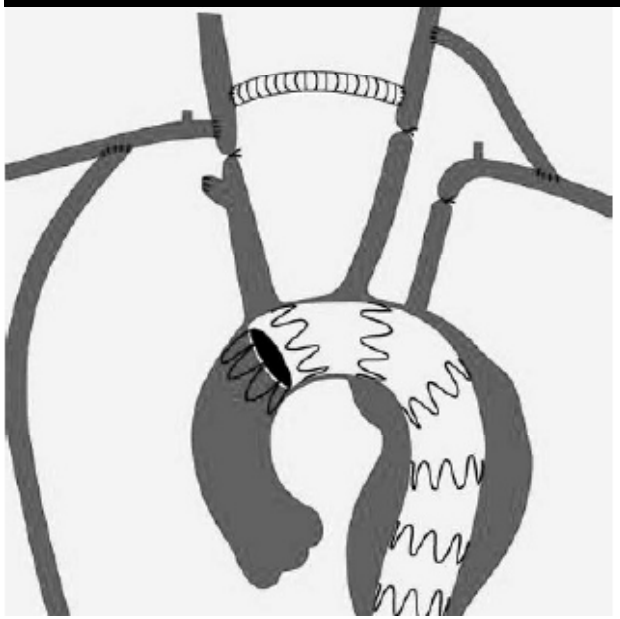


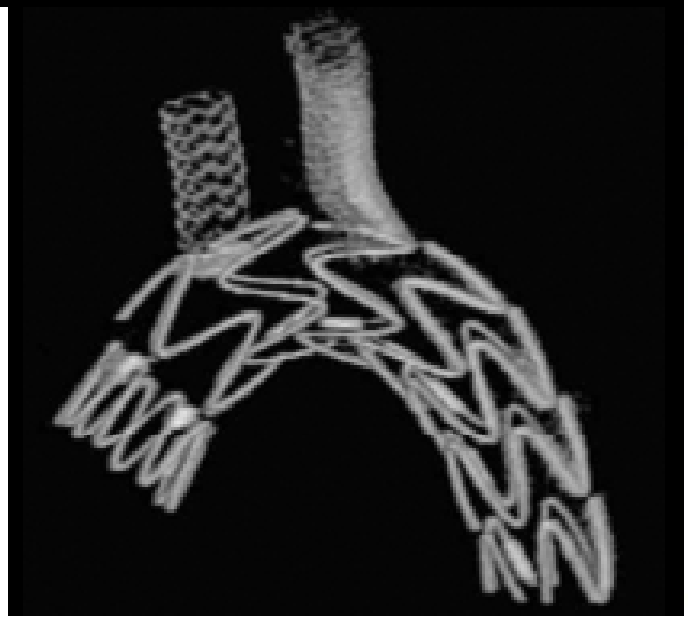
ROBERT D. HEATH, M.D. The Subclavian Steal Syndrome. *J Bone Joint Surg Am. 1972;54:1033-1039*

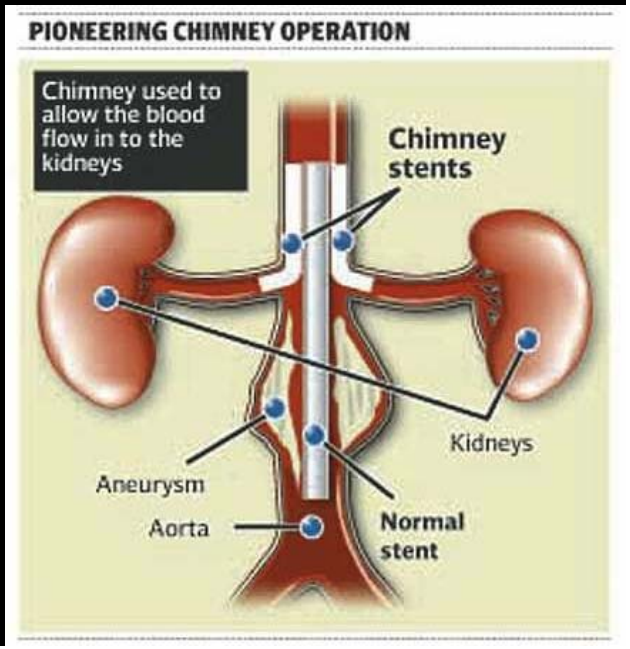
What we can do?

Immediate Restore flow to Left Arm!!!!

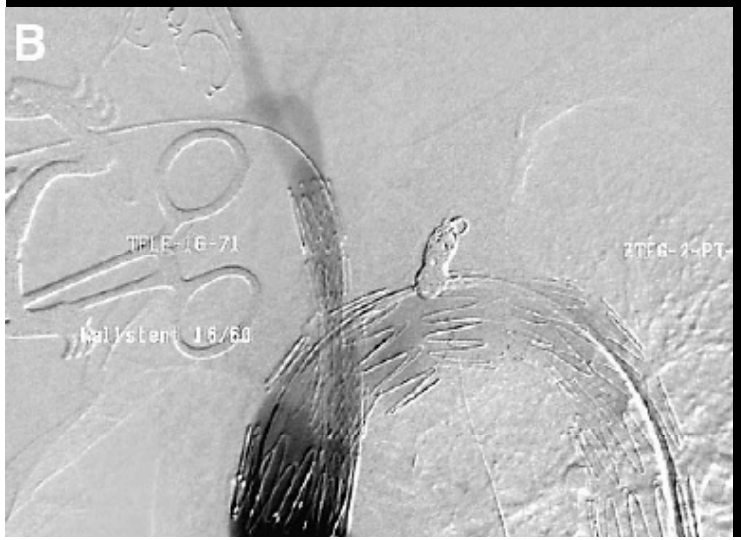
1. Fenestrated Stent Graft?
2. Chimney stent technique?
3. Sent to Surgeon?

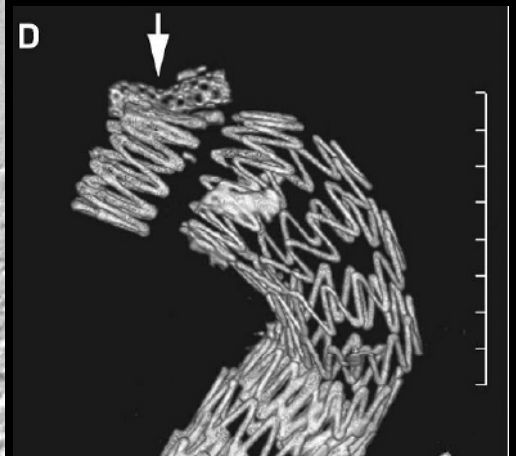






Chimney Stent to LSCA





J ENDOVASC THER
2008;15:427–432

◆ TECHNICAL NOTE

The Chimney Graft: A Technique for Preserving or Rescuing Aortic Branch Vessels in Stent-Graft Sealing Zones

Tomas Ohrlander, MD; Björn Sonesson, MD, PhD; Krasnodar Ivancev, MD, PhD; Timothy Resch, MD, PhD; Nuno Dias, MD, PhD; and Martin Malina, MD, PhD

Vascular Center Malmö-Lund, Malmö University Hospital, Malmö, Sweden.

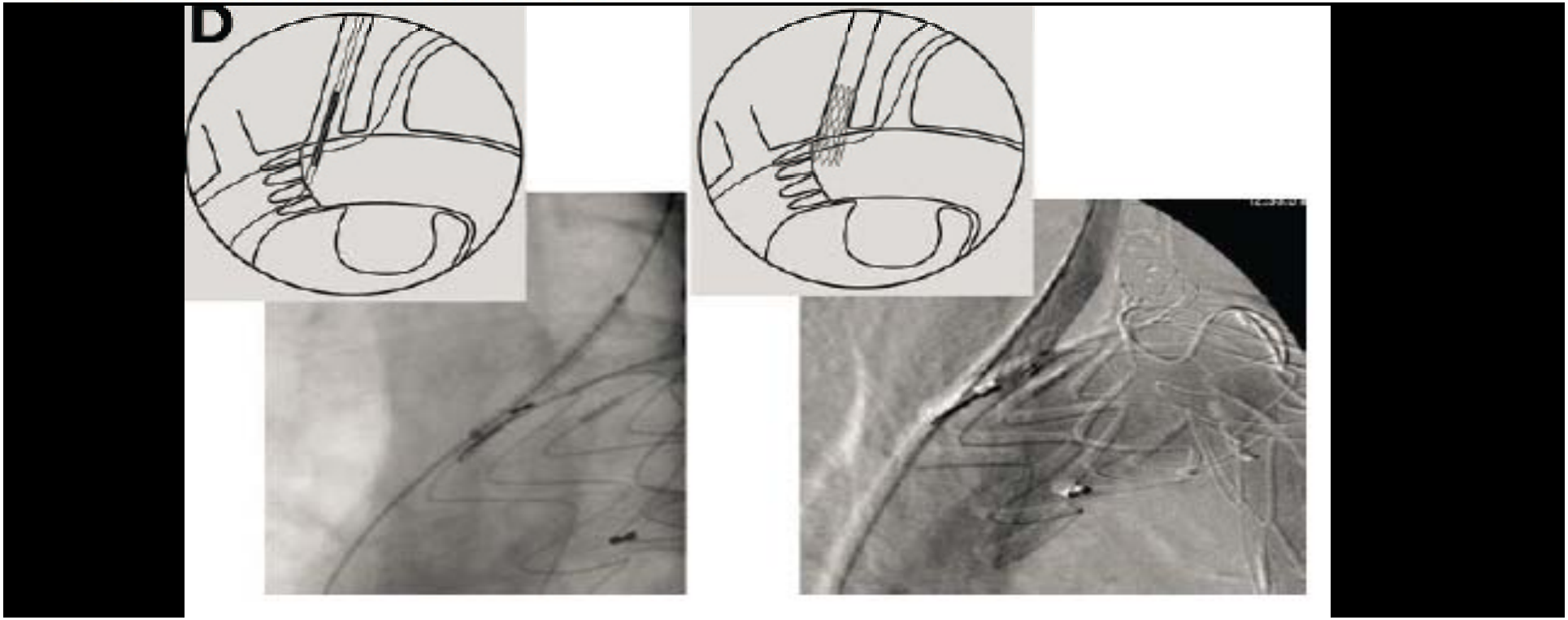
J ENDOVASC THER
2009;16(Suppl I):I63–I79

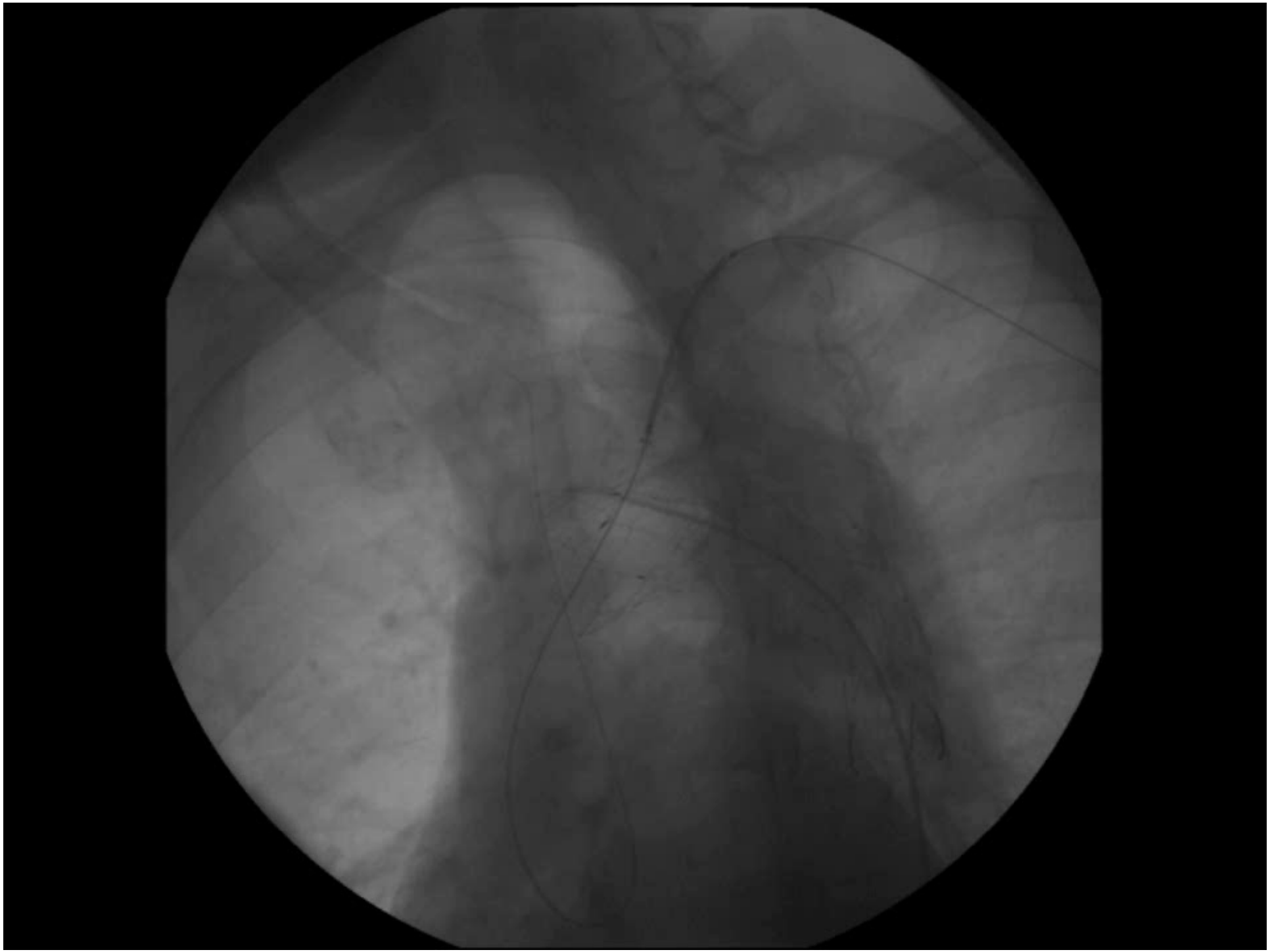
◆ REVIEW ◆

Technical Solutions for Common Problems in TEVAR: Managing Access and Aortic Branches

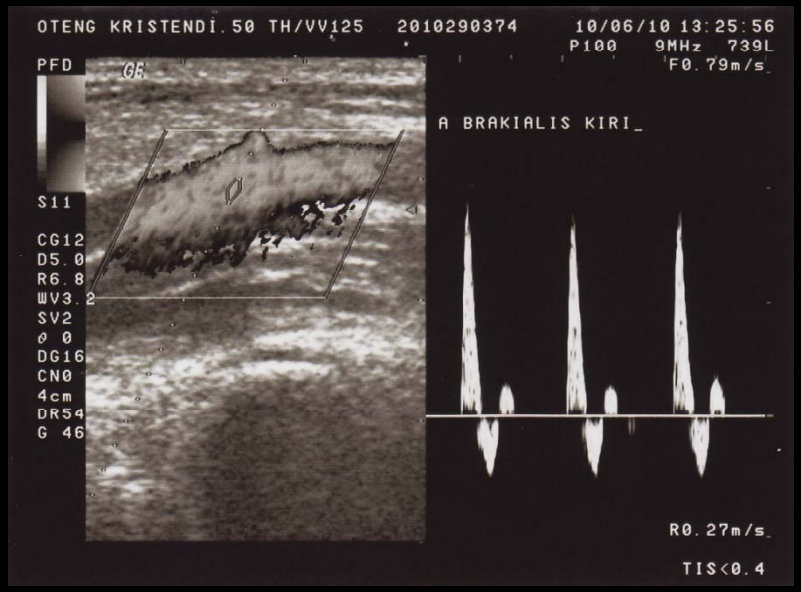
Frank J. Criado, MD; Christine McKendrick, RN; and Francis R. Criado, BS

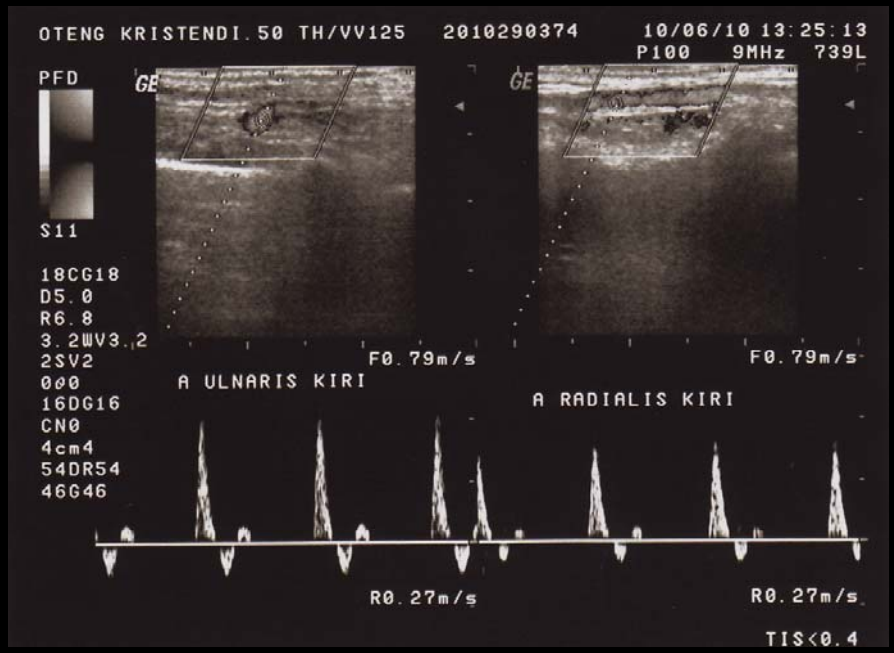
Vascular Surgery and Endovascular Intervention, Union Memorial Hospital-MedStar Health, Baltimore, Maryland, USA.



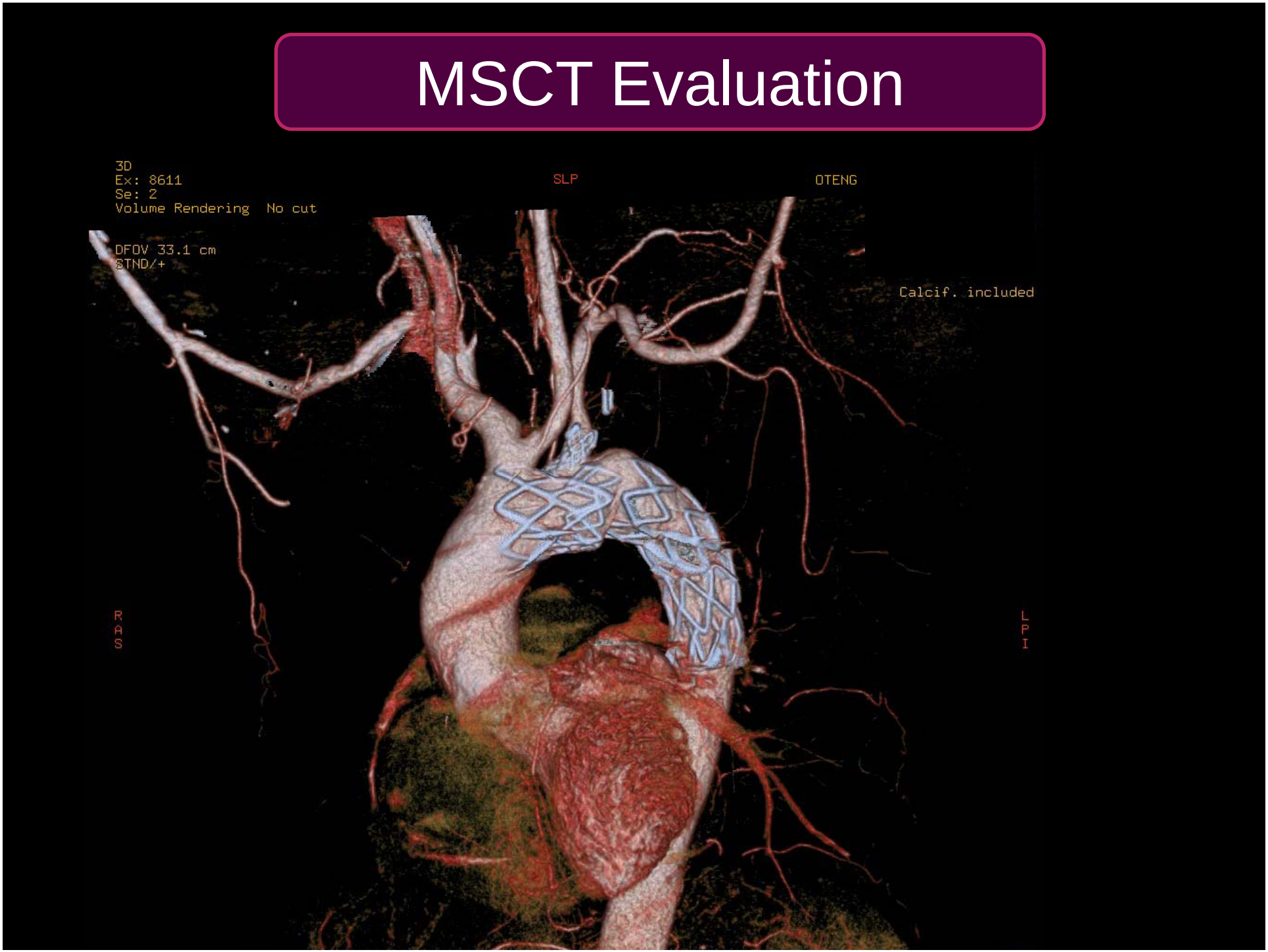


Dupplex Sonography





MSCT Evaluation



LESSON to LEARN

1. Be aware of abnormal origin of Left Vertebral Artery, especially if you intentionally cover LSCA origin
2. When you intentionally cover the LSCA origin be sure :
   a. Four vessel study
   b. Patency of Circle of Willis, as retrograde flow from Left Vert Artery goes to Left Arm
   c. Always evaluating L Arm blood flow , either by clinical evaluation, physical exams or duplex sonography
3. Be prepared of LSCA restoration if necessary (fenestrated or chimney stent should be available)
4. L Brachial access is crucial for LSCA chimney stent technique

Summary

- TEVAR is a procedure of choice for Descending Thoracic Aortic Dissection
- Branches of the aorta should be carefully evaluated before the procedure
- Chimney stent is effective in dealing with symptomatic subclavian artery occlusion