Pulmonary Endarterectomy (PEA) for Chronic Thromboembolic Pulmonary Hypertension (CTEPH): *How We Do It?*

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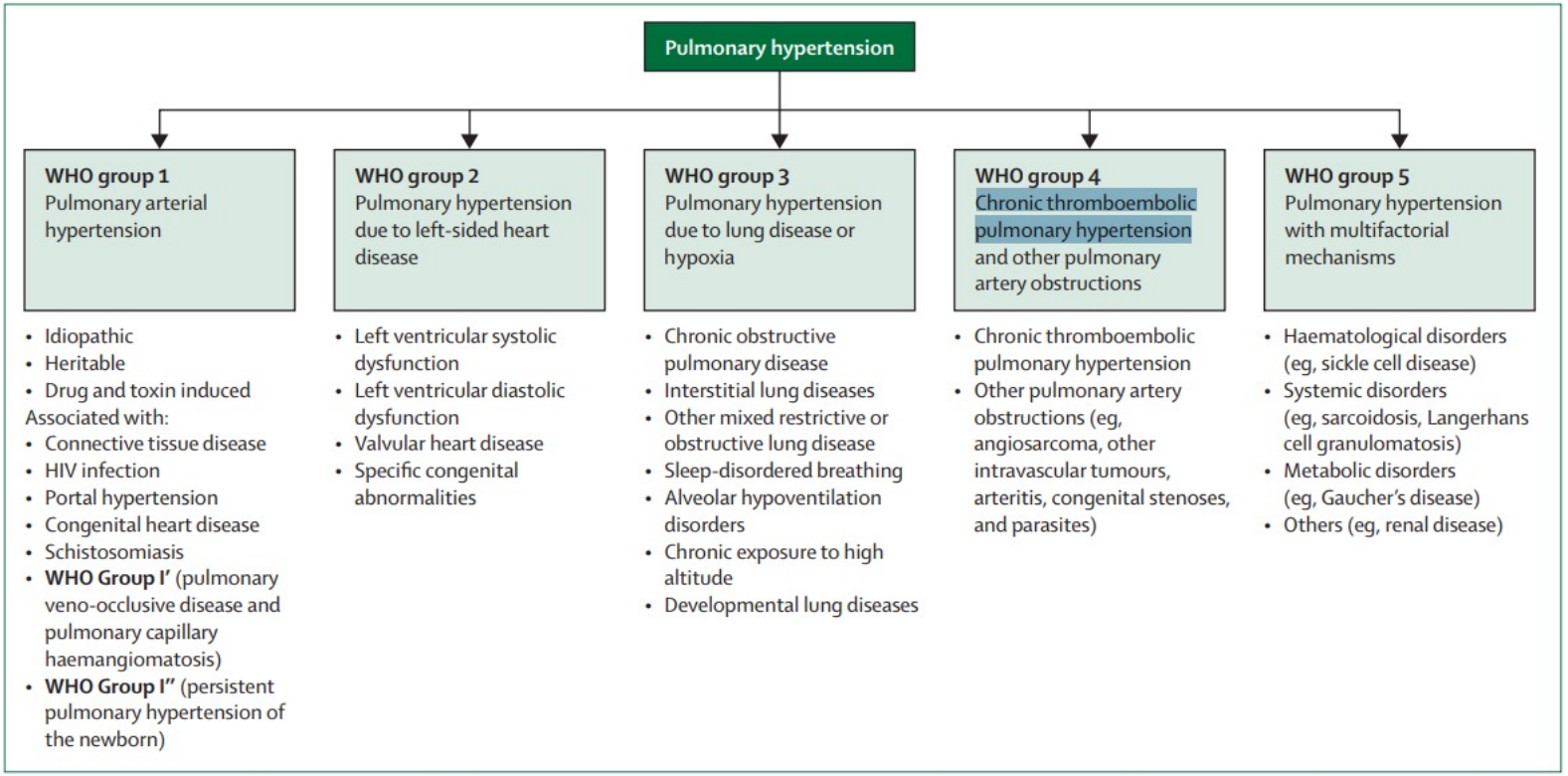


Galiè N, Humbert M, Vachiery JL, et al. 2015 ESC/ERS Guidelines for the diagnosis and treatment of pulmonary hypertension: Eur Heart J 2016; 37: 67–119

Disclosure

I have no disclosures

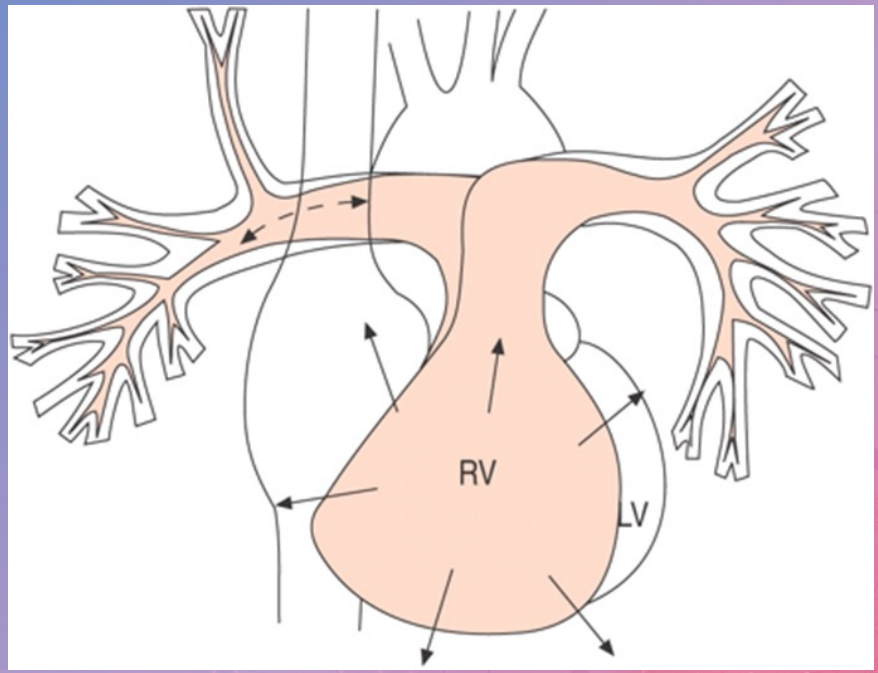
REVIEW ARTICLE

CURRENT CONCEPTS

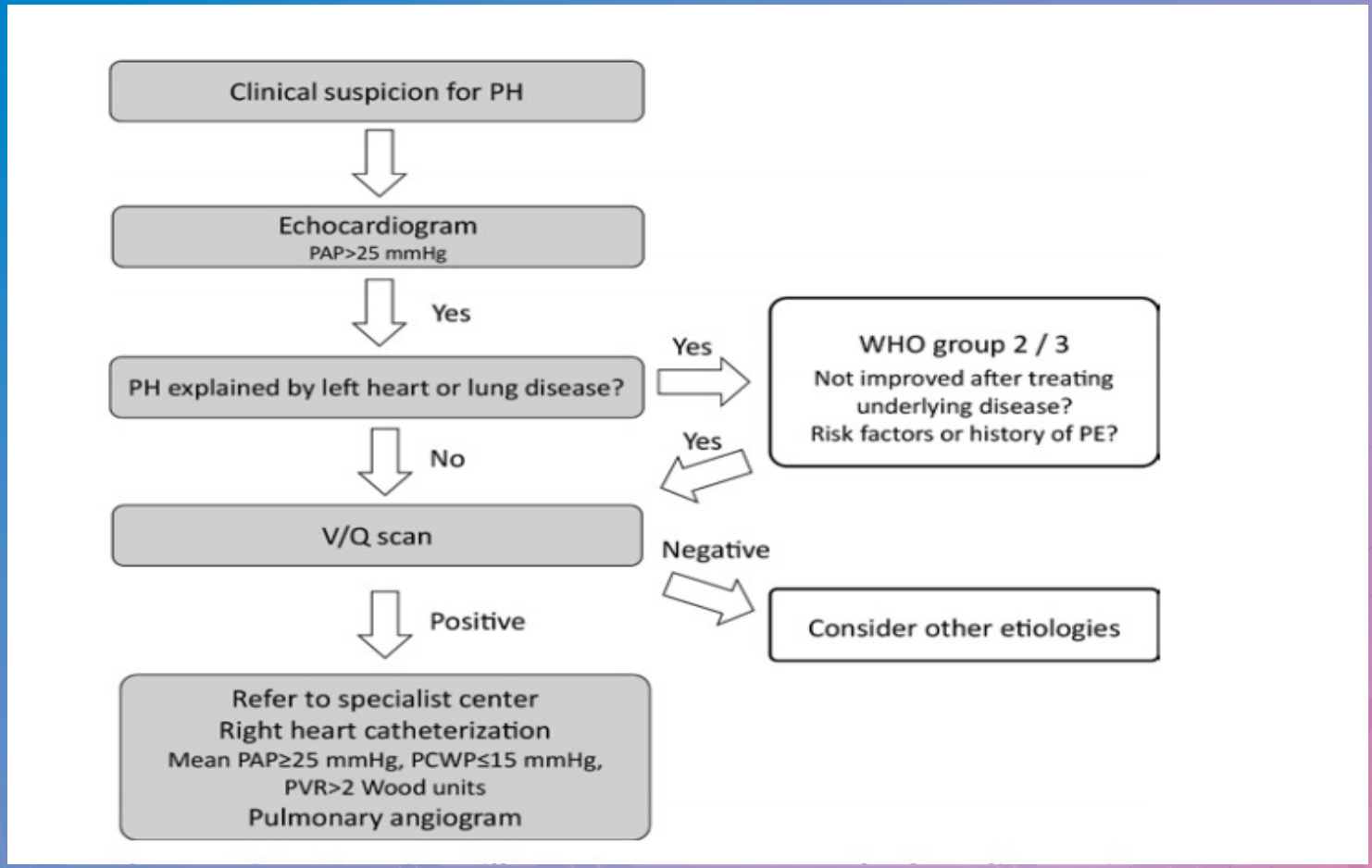
Chronic Thromboembolic Pulmonary Hypertension

Gregory Piazza, M.D., and Samuel Z. Goldhaber, M.D.

- Definition: mPAP >25 mmHg by RHC
- 1-5% of acute PE will develop chronic pulmonary hypertension
- Persistent microvascular obstructions
- Thrombus becomes organized and incorporated within endothelium
- Treatment: Potentially Curable by Pulmonary Endarterectomy (PEA)



N ENGL J MED 364;4 NEJM.ORG JANUARY 27, 2011



PAP = pulmonary artery pressure, PCWP = pulmonary capillary wedge pressure, PH = pulmonary hypertension, PVR = pulmonary vascular resistance, V/Q = ventilation-perfusion, WHO = World Health Organization.

RadioGraphics 2019; 39:169–185 https://doi.org/10.1148/rg.2019180074

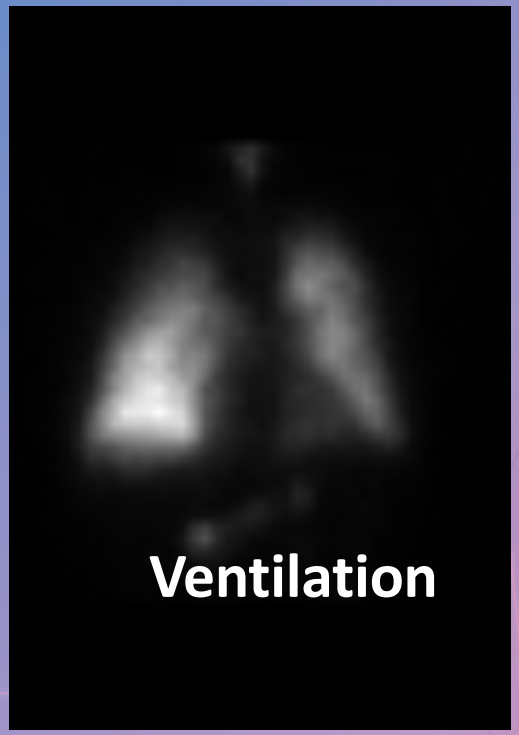
Patient Presentation

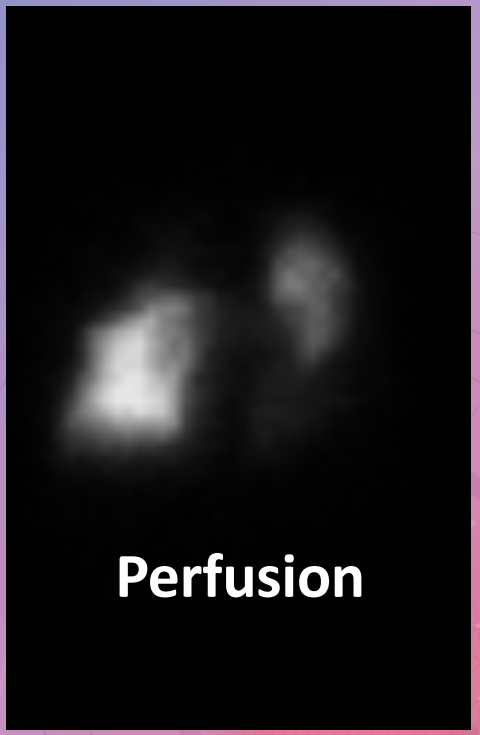
64M referred to us for evaluation of potential PEA. Pt presented with hx. of dyspnea on exertion (NYHA class I-II sx), known hx of factor V Leiden, low activated protein C resistance and prior hx. of DVT/PE with evidence of CTEPH. Preliminary worked up was done by our PH Service include all routine labs / cxr

- VQ Scan and Echo

Diagnostic evaluation

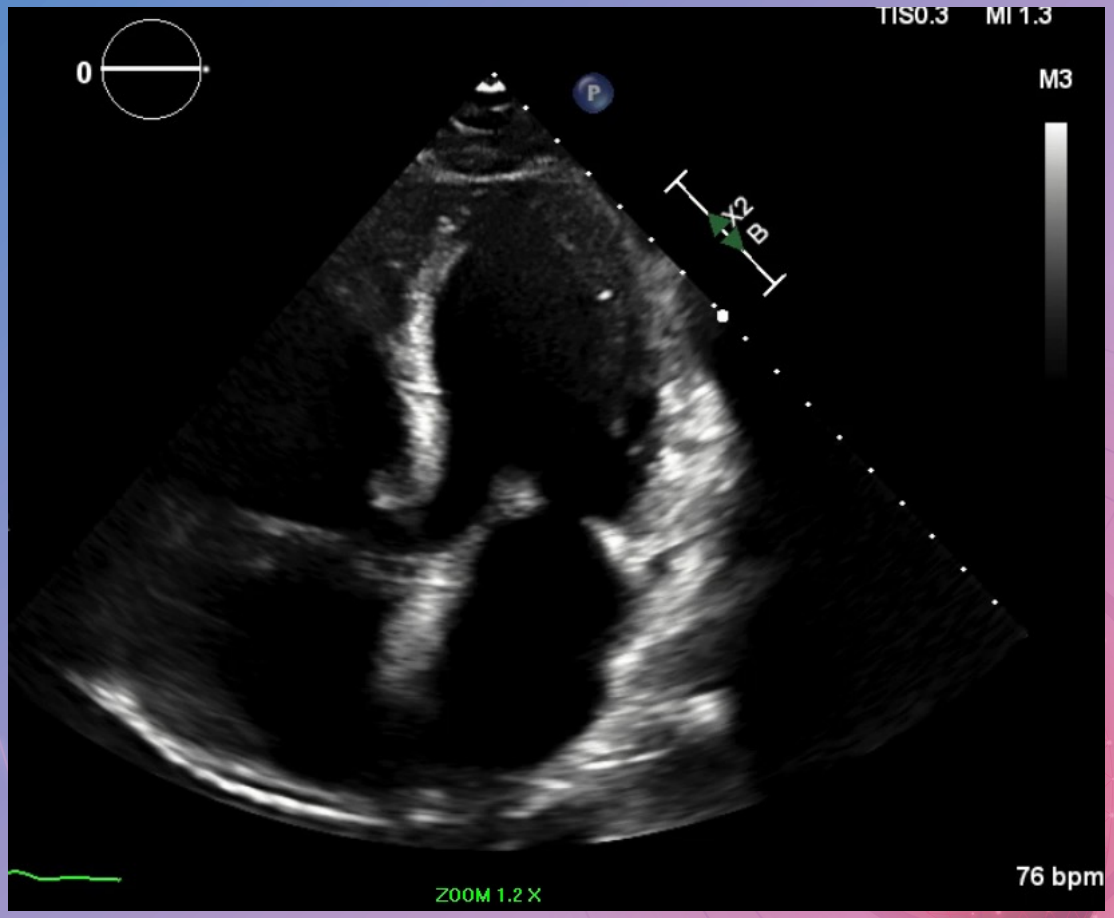
- V/Q scanning
  - Segmental perfusion defects
  - Magnitude of defects underestimates severity of obstruction
    - Stenoses rather than obstruction
    - Bronchial perfusion



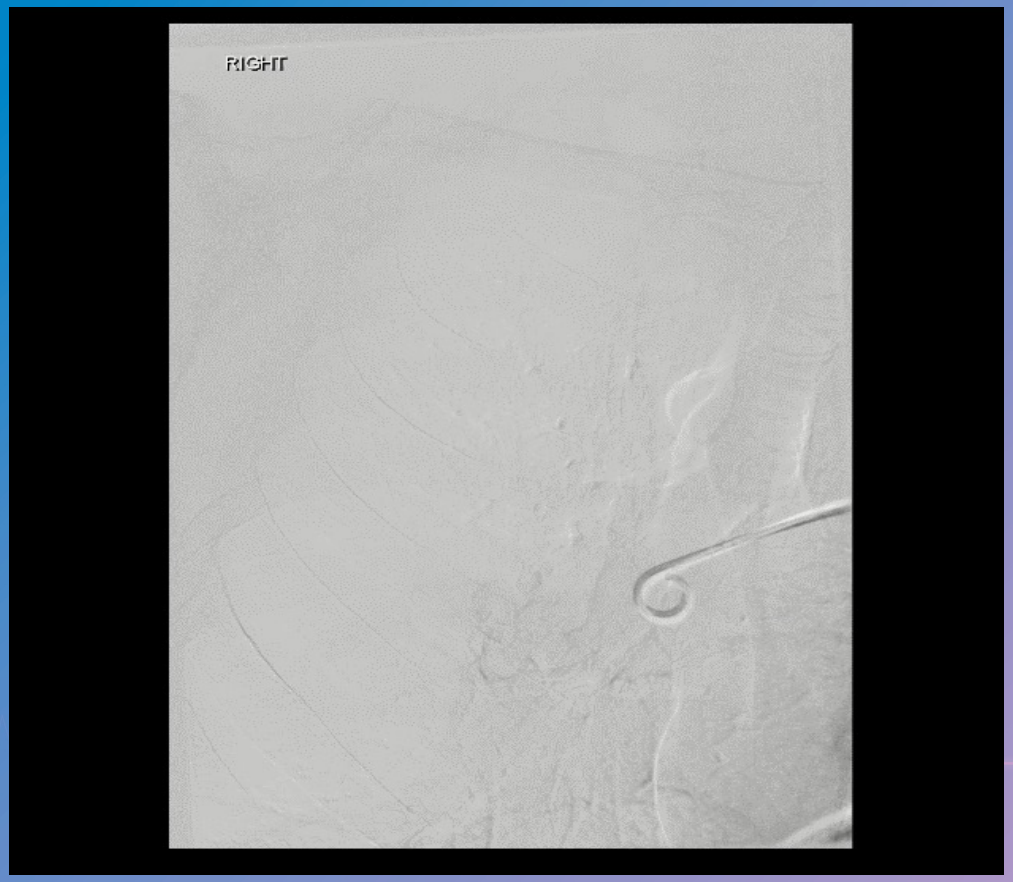


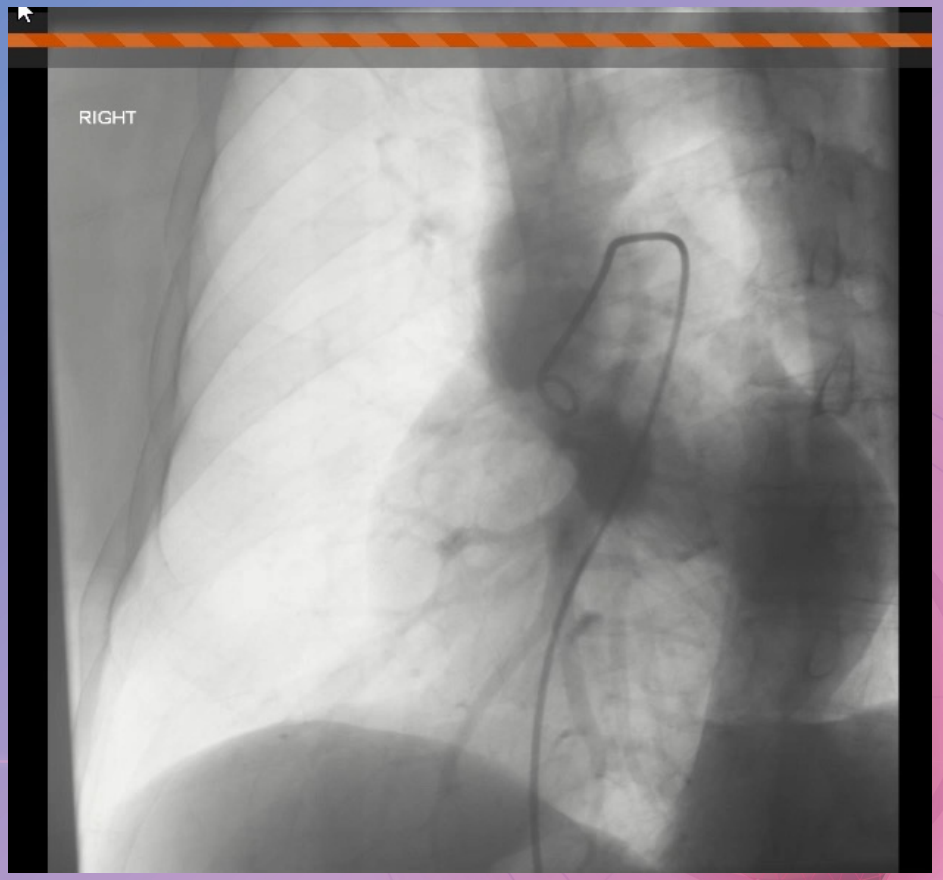
- Echo:

- EF: 50%.
- Mild AI, Mild MR, Severe TR, Trace PR.
- Severe RA Dilation
- Severe RV Hypertrophy
- No PFO/ASD

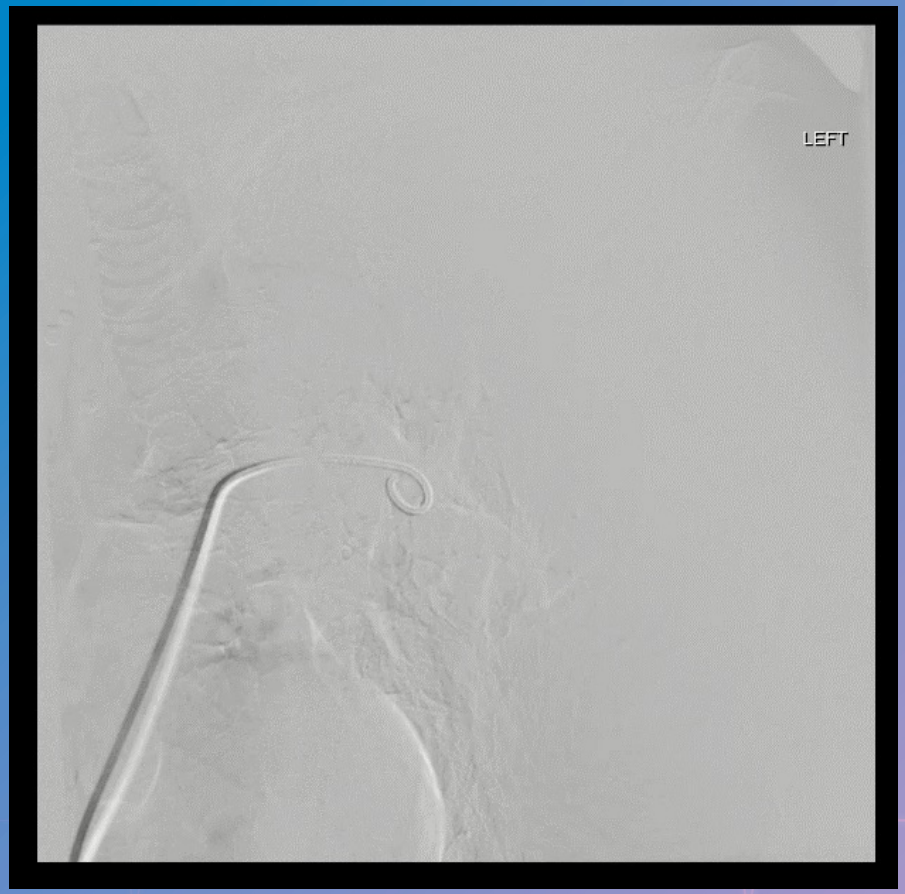


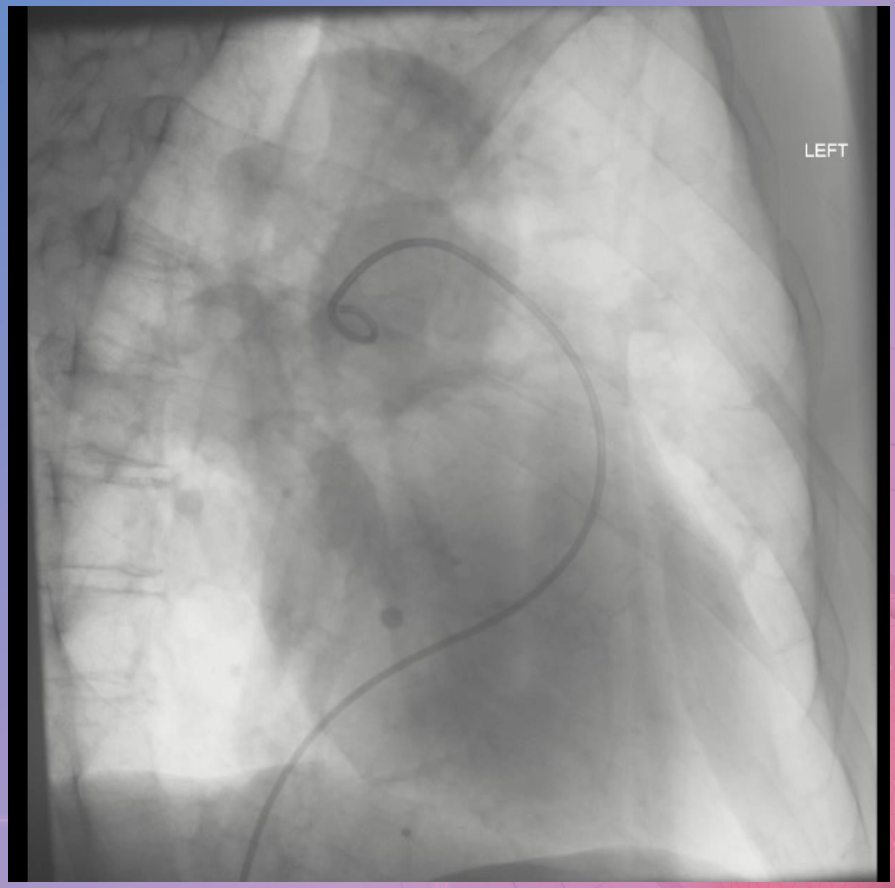
Right pulmonary artery pressures (mm Hg): 63/14 (32)





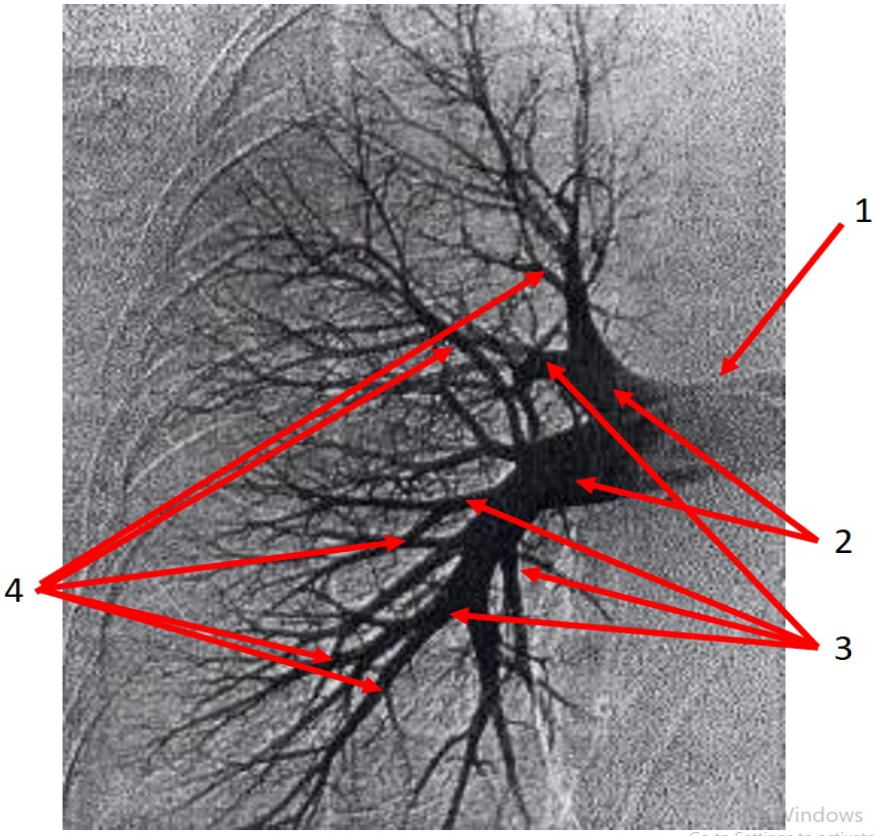
Left pulmonary artery pressures (mm Hg): 67/15 (33)

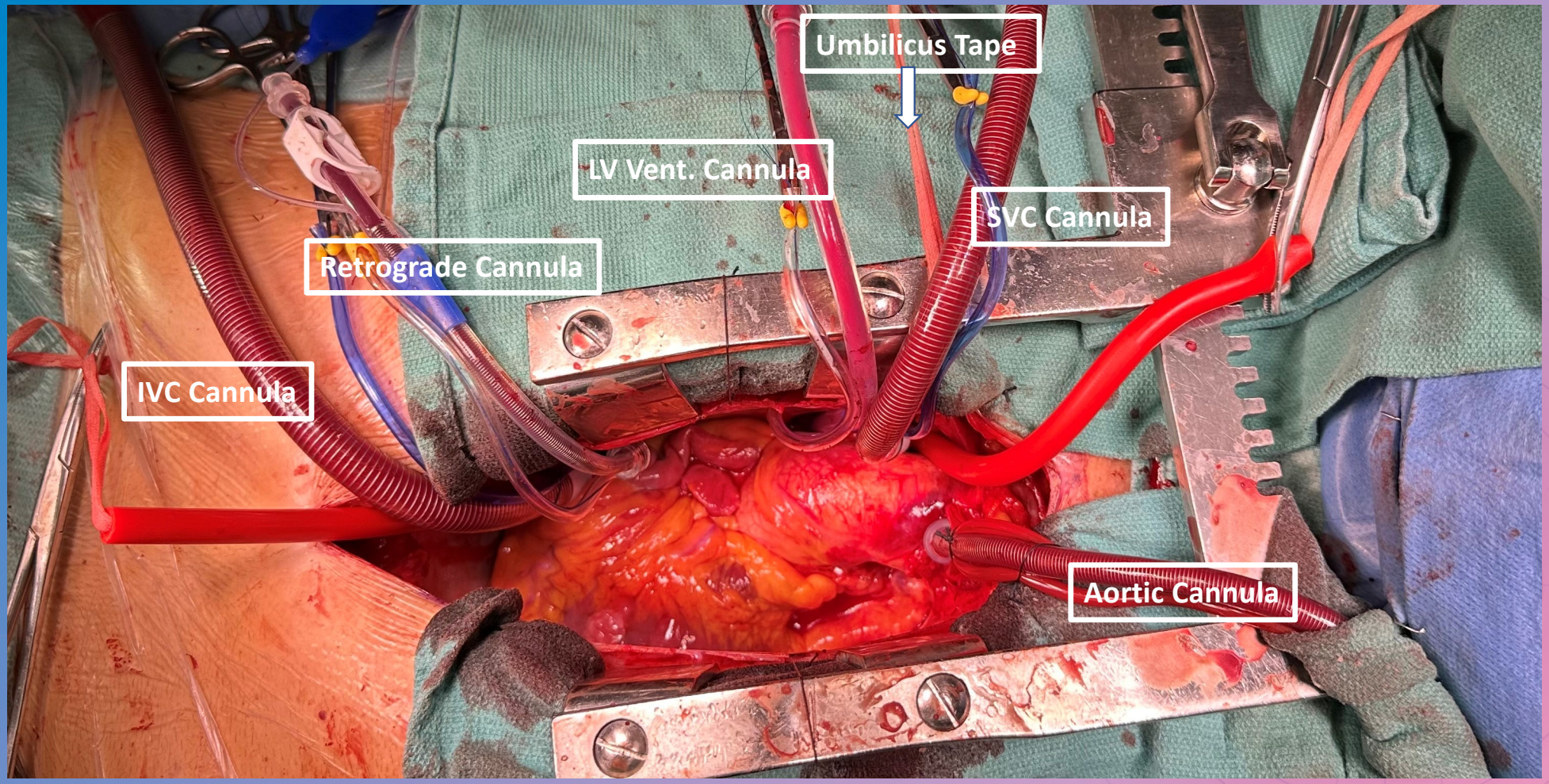




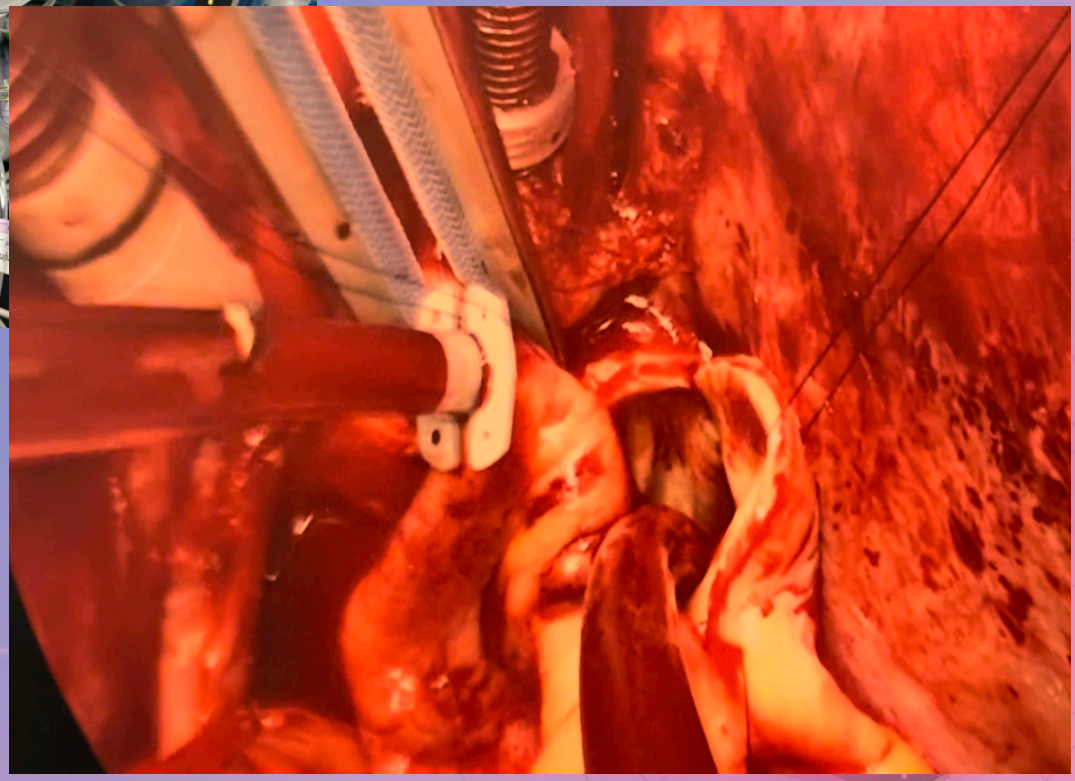
PEA Surgical Indications

- 1. Established Diagnosis
  - ✓Functional Status
  - ✓Mismatched defects on V/Q
  - ✓Pulmonary Angiogram
- 2. Disease Surgically Accessible
  Jamieson Classification (UCSD)
  - I. Branch PA
  - II. Lobar
  - III. Segmental
  - IV. Subsegmental
- 3. Balancing risks vs. benefits




Umbilicus Tape
LV Vent. Cannula
SVC Cannula
Retrograde Cannula
IVC Cannula
Aortic Cannula


10/26/2023 1:16:16 PM
MENU
95
71
BL
55
67
BL
15
12:30
13:00
CURRENT
CHANGE
68
4 %
CURRENT
CHANGE
56
16 %
22
UMHS
583826
Medtronic



Special Instruments

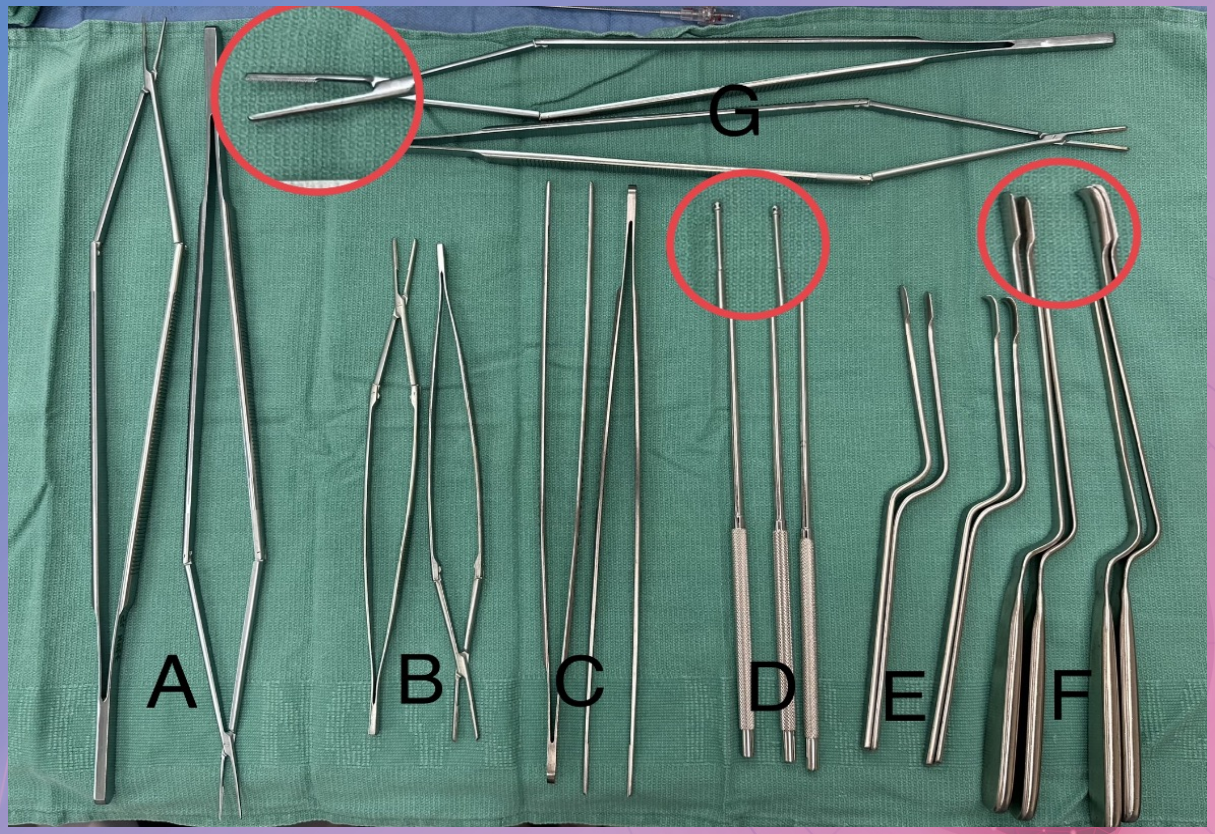
Double-action PEA forceps

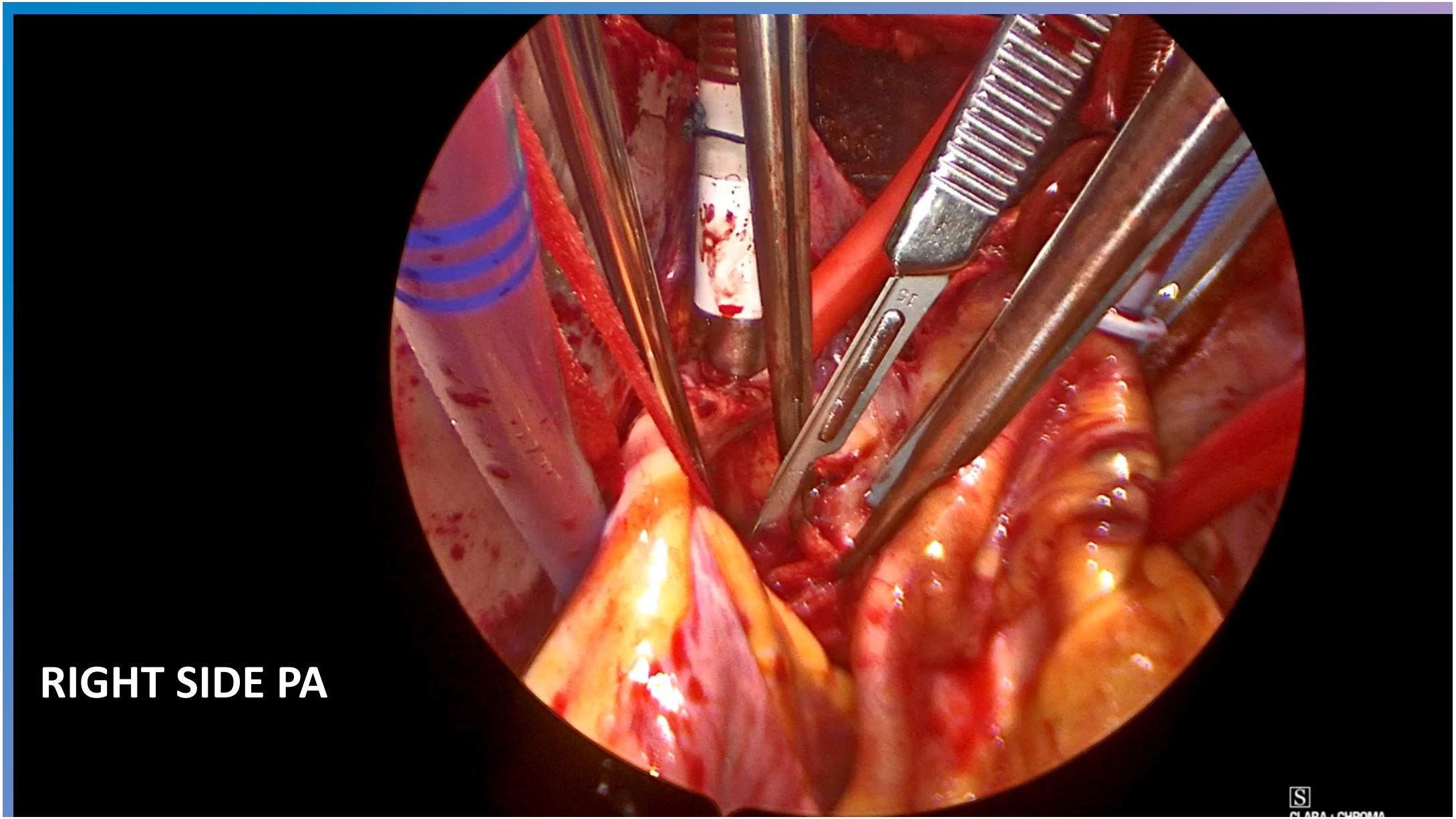
(A) 1 mm tip (16” Length)
(B) 2.5 mm tip (9” Length)
(G) 2.5 mm tip ((16” Length)

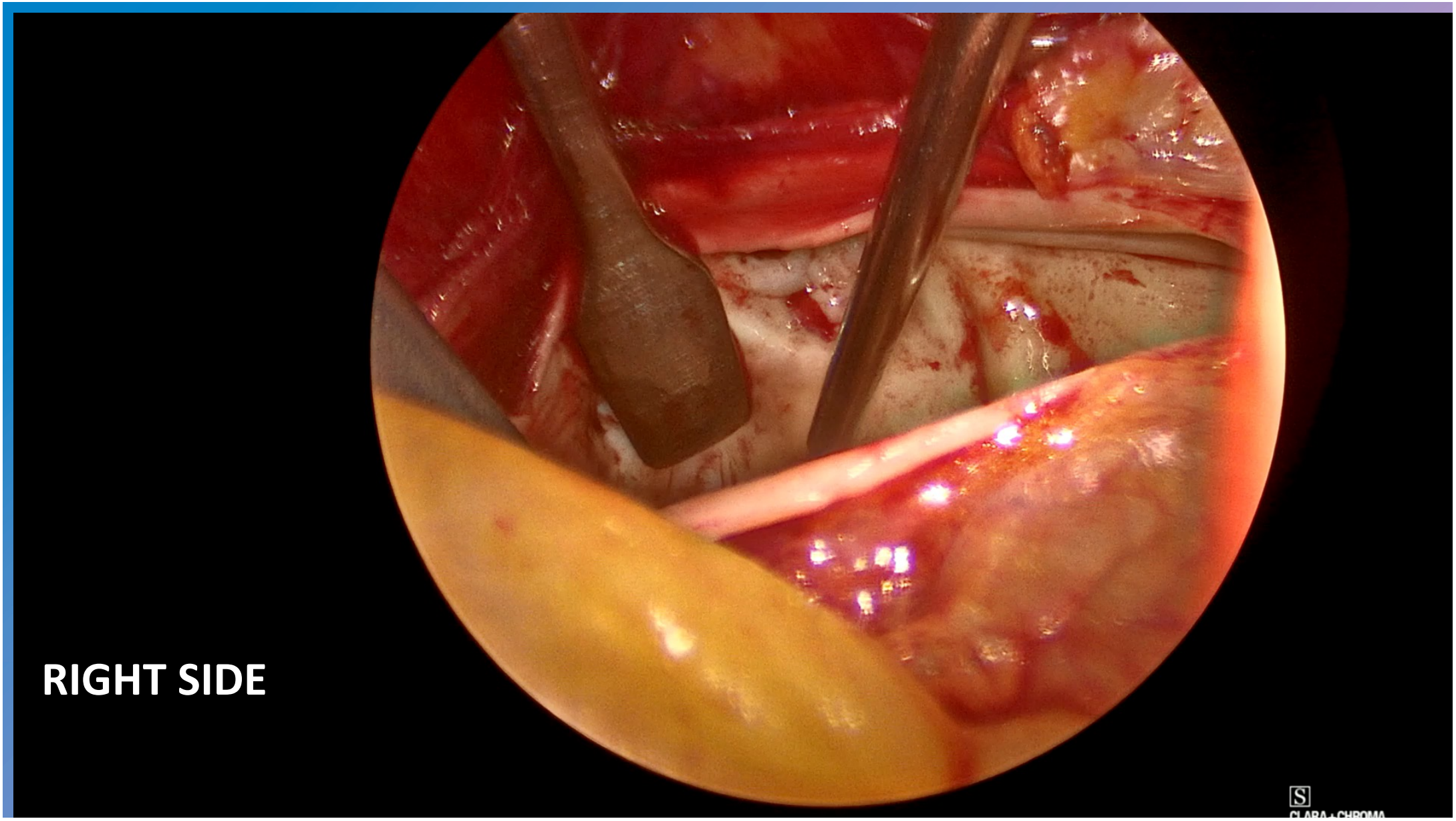
(C) Debakey Forceps 2 mm tip (12’ Length)

(D) Jamieson Suction /Dissection Ball Tip (11”)

Nerve Root Retractors
(E) 9” Flat and Curved Tips
(F) 12” Flat and Curved Tips




RIGHT SIDE PA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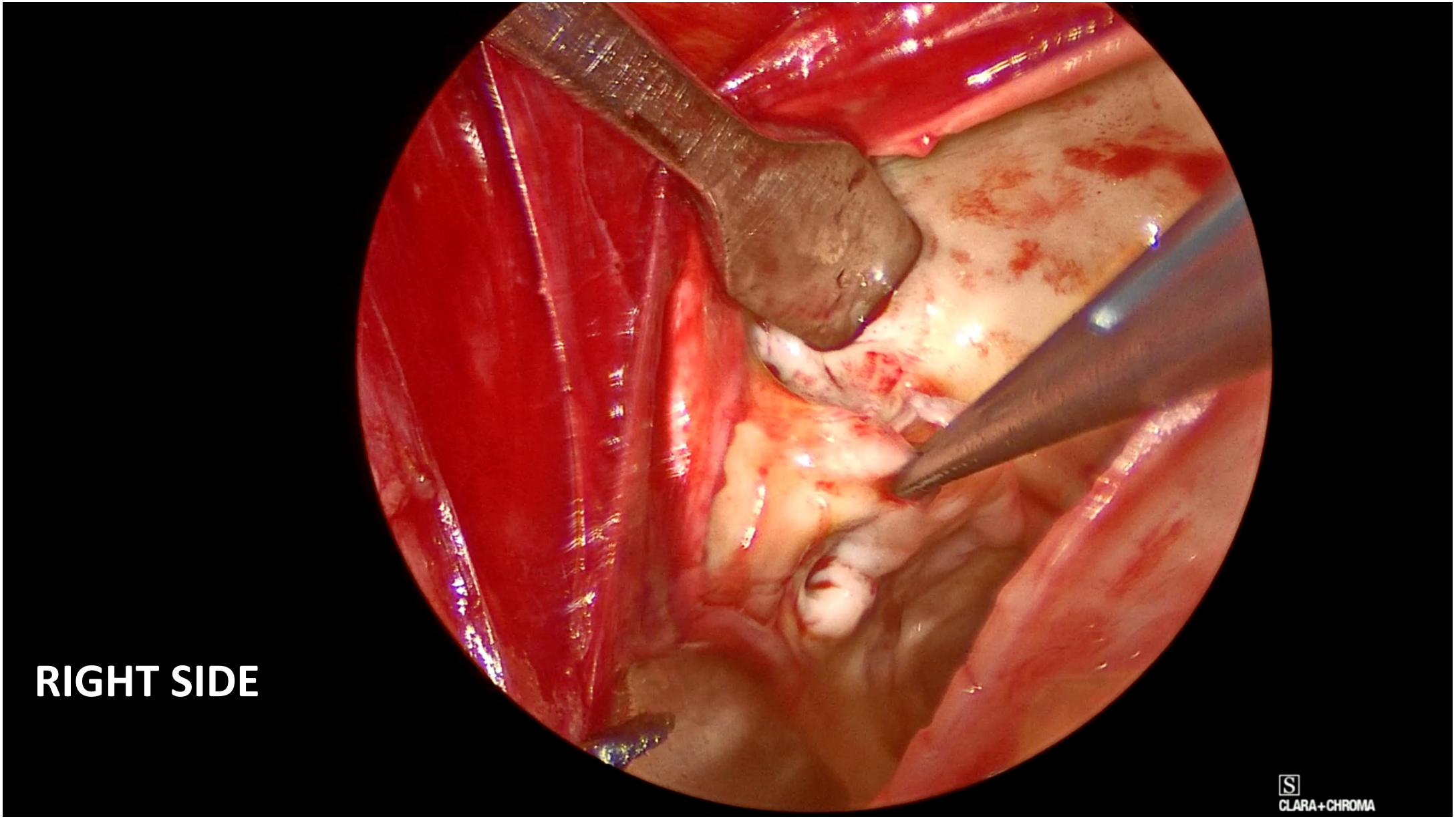
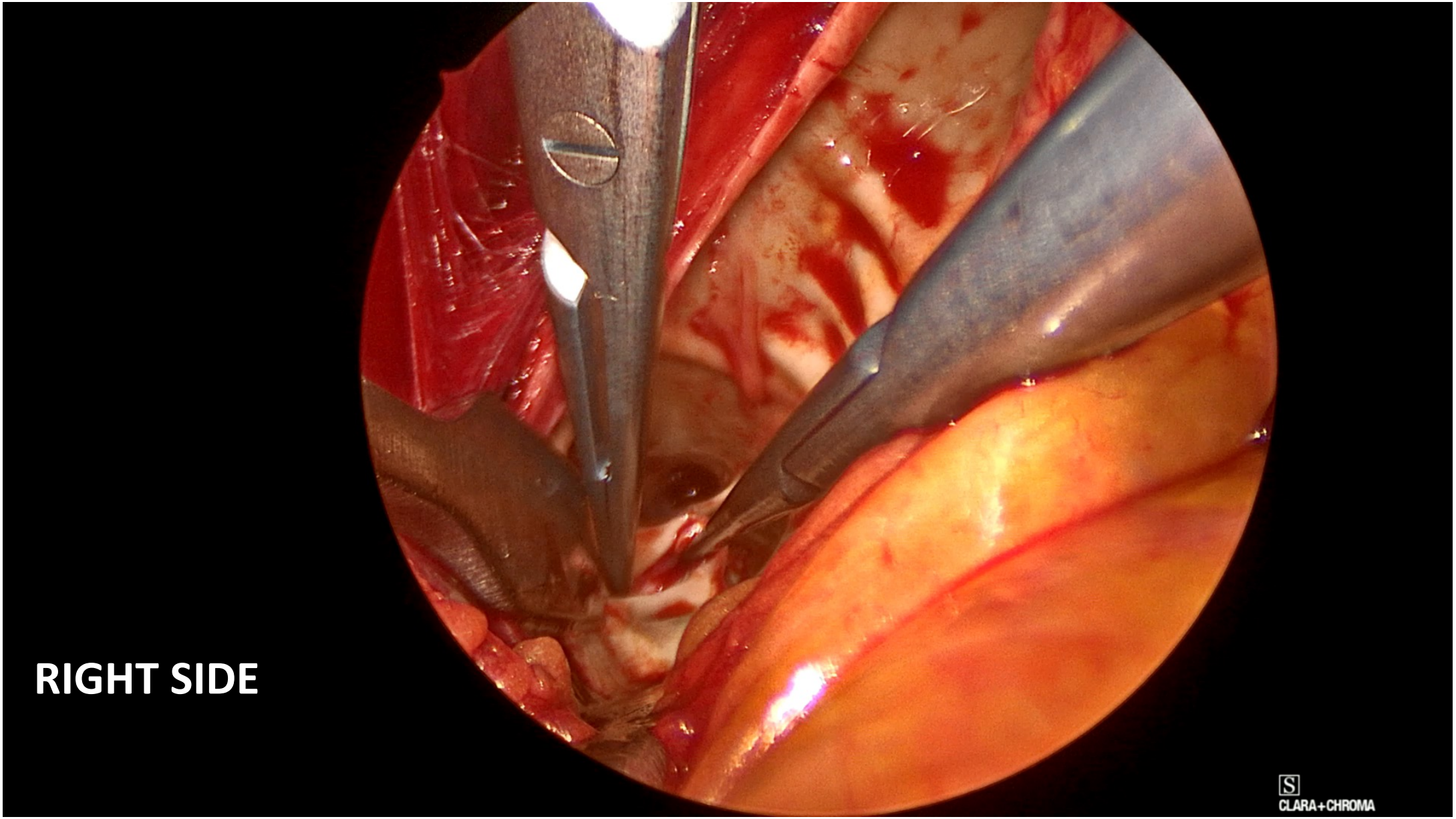

RIGHT SIDE
CLARA+CHROMA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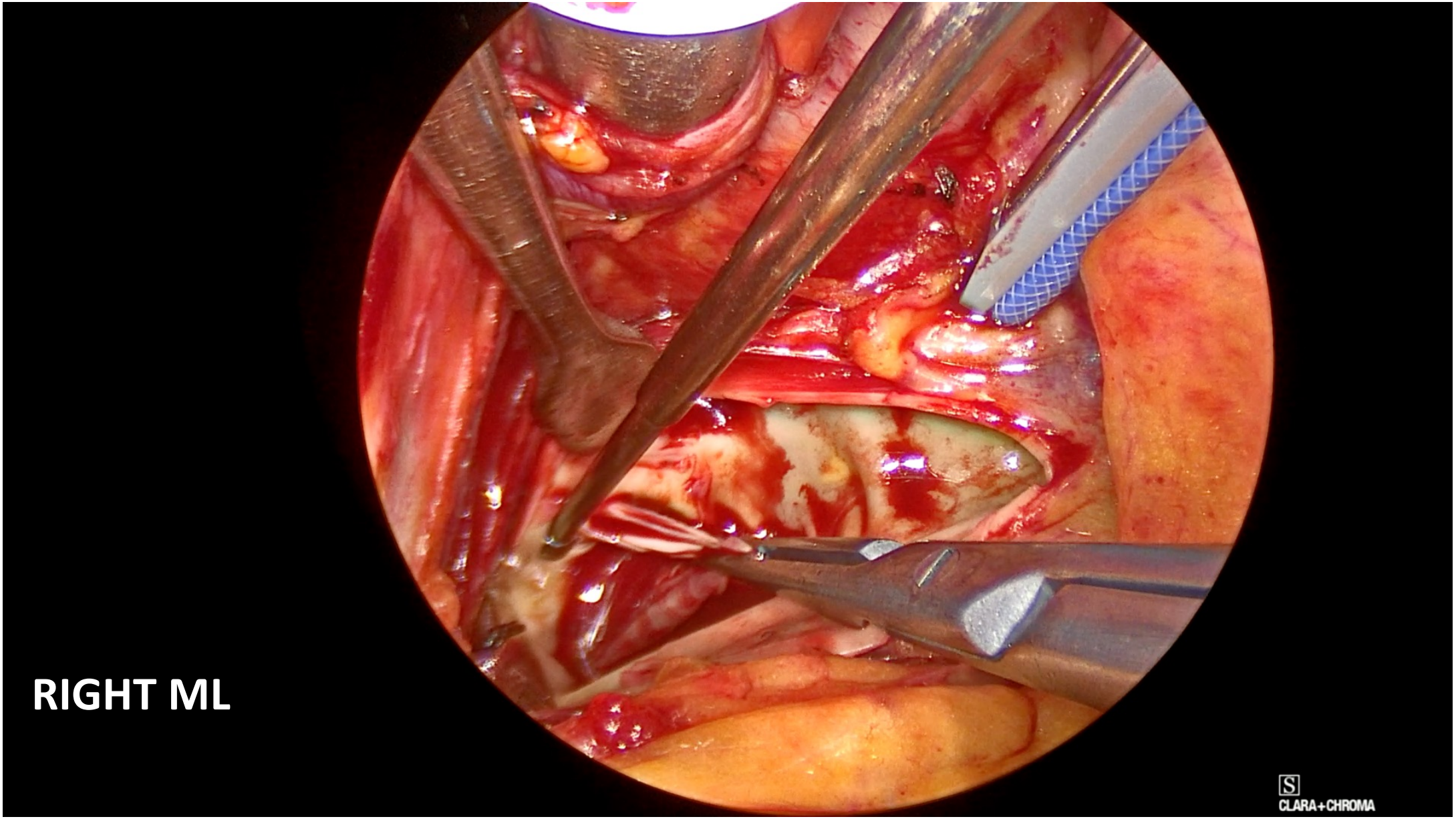
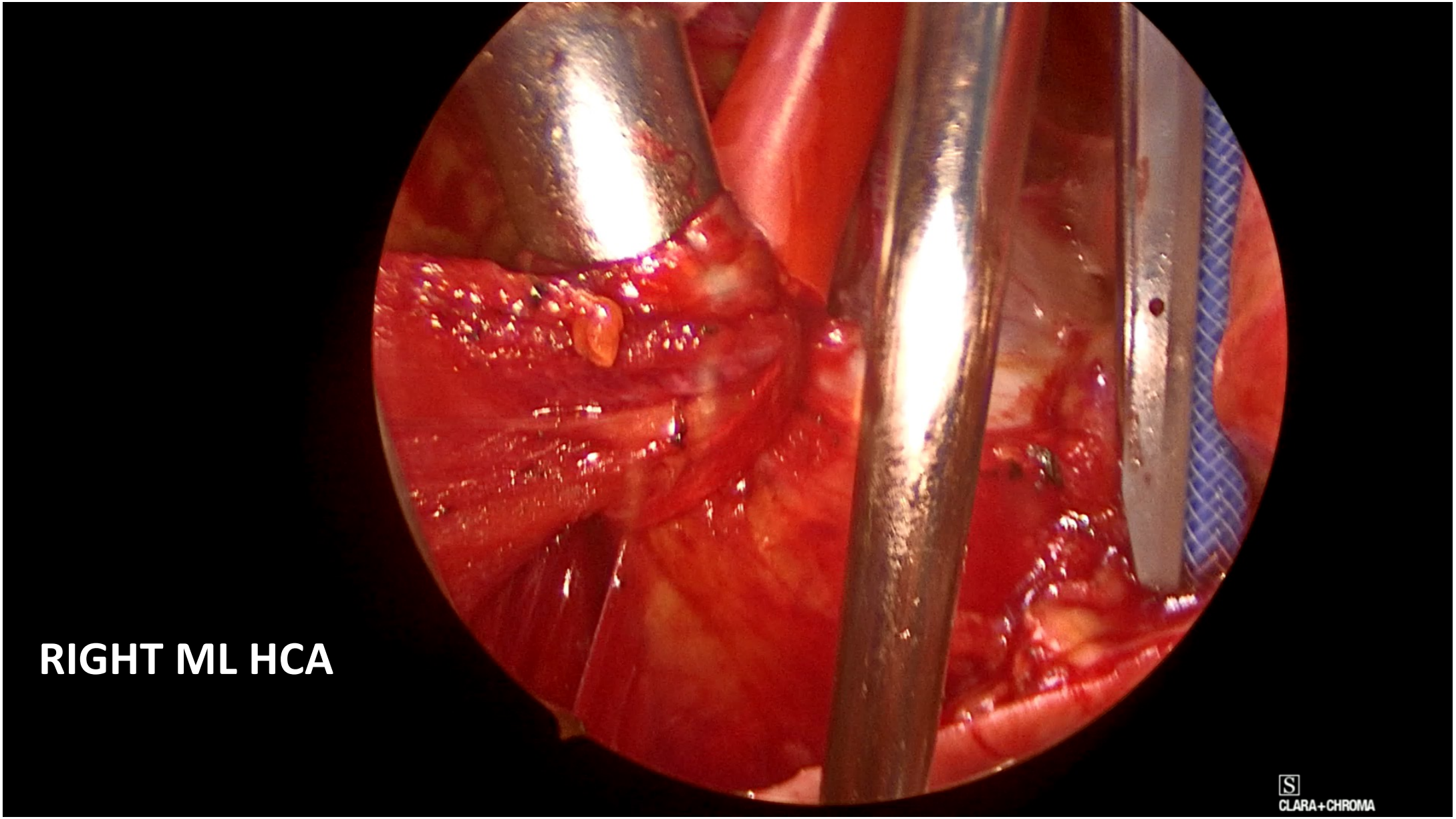
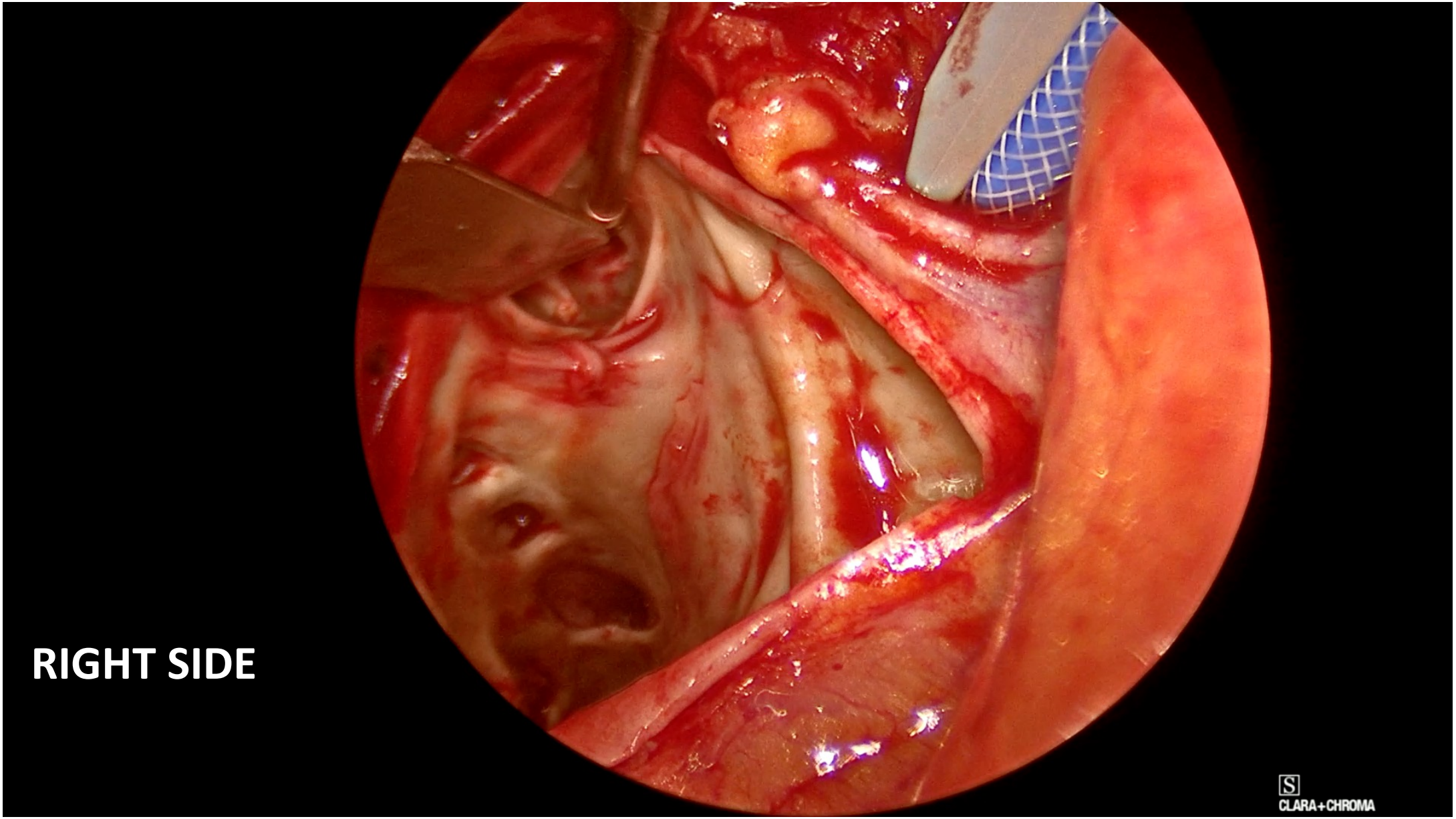
CLARA+CHROMA


RIGHT ML
CLARA+CHROMA


RIGHT ML HCA
CLARA+CHROMA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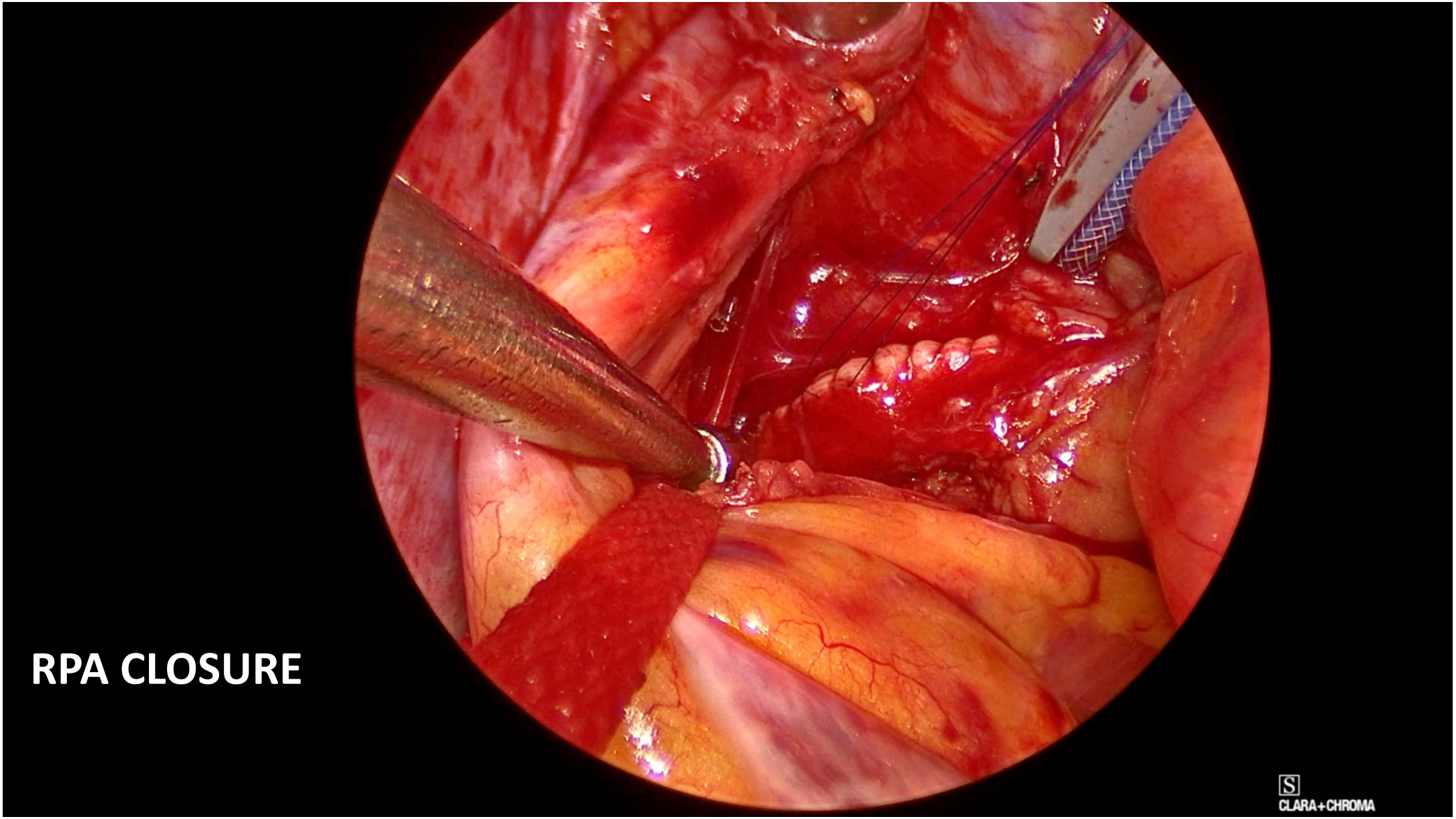
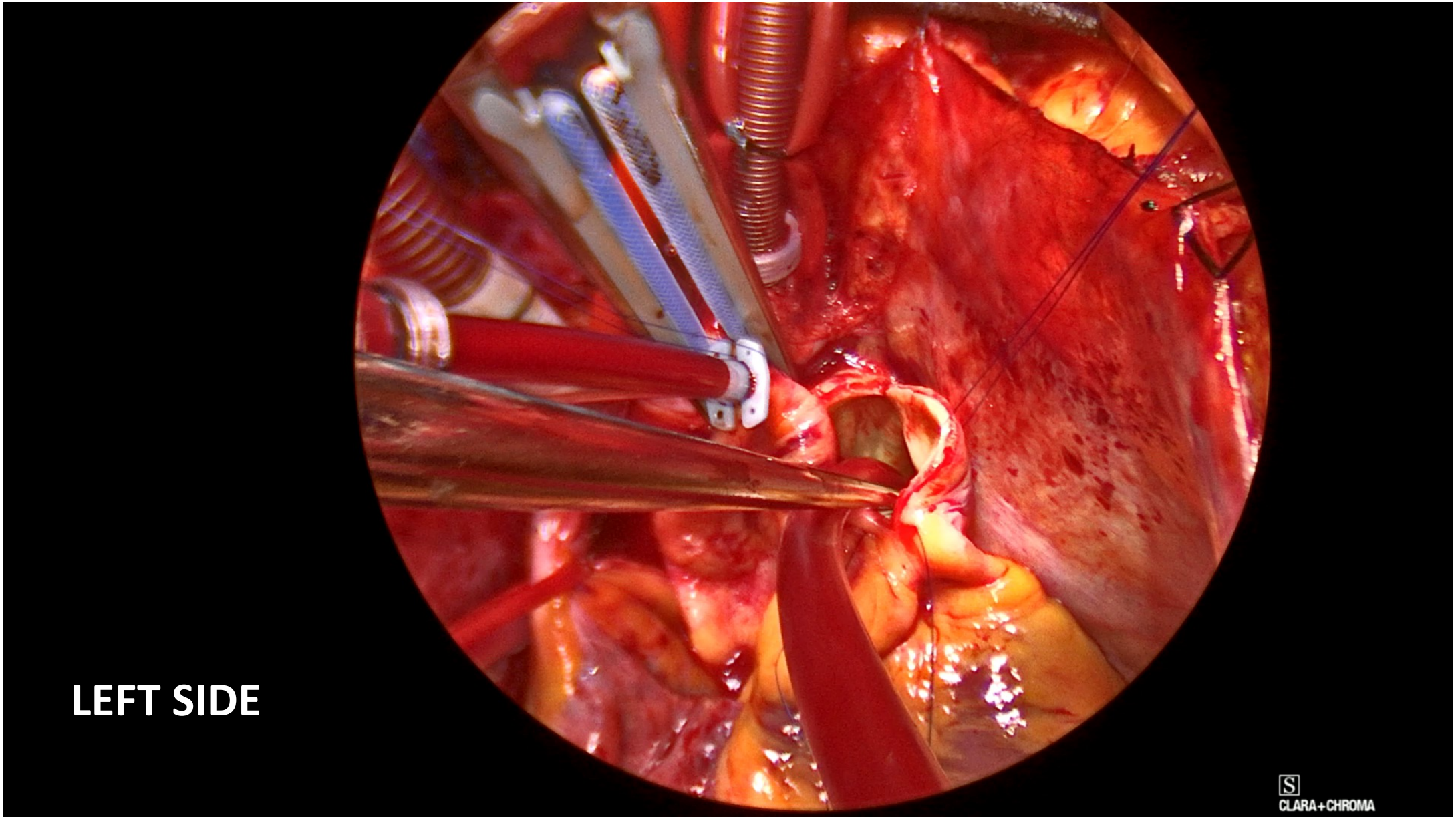
CLARA+CHROMA


RPA CLOSURE
CLARA+CHROMA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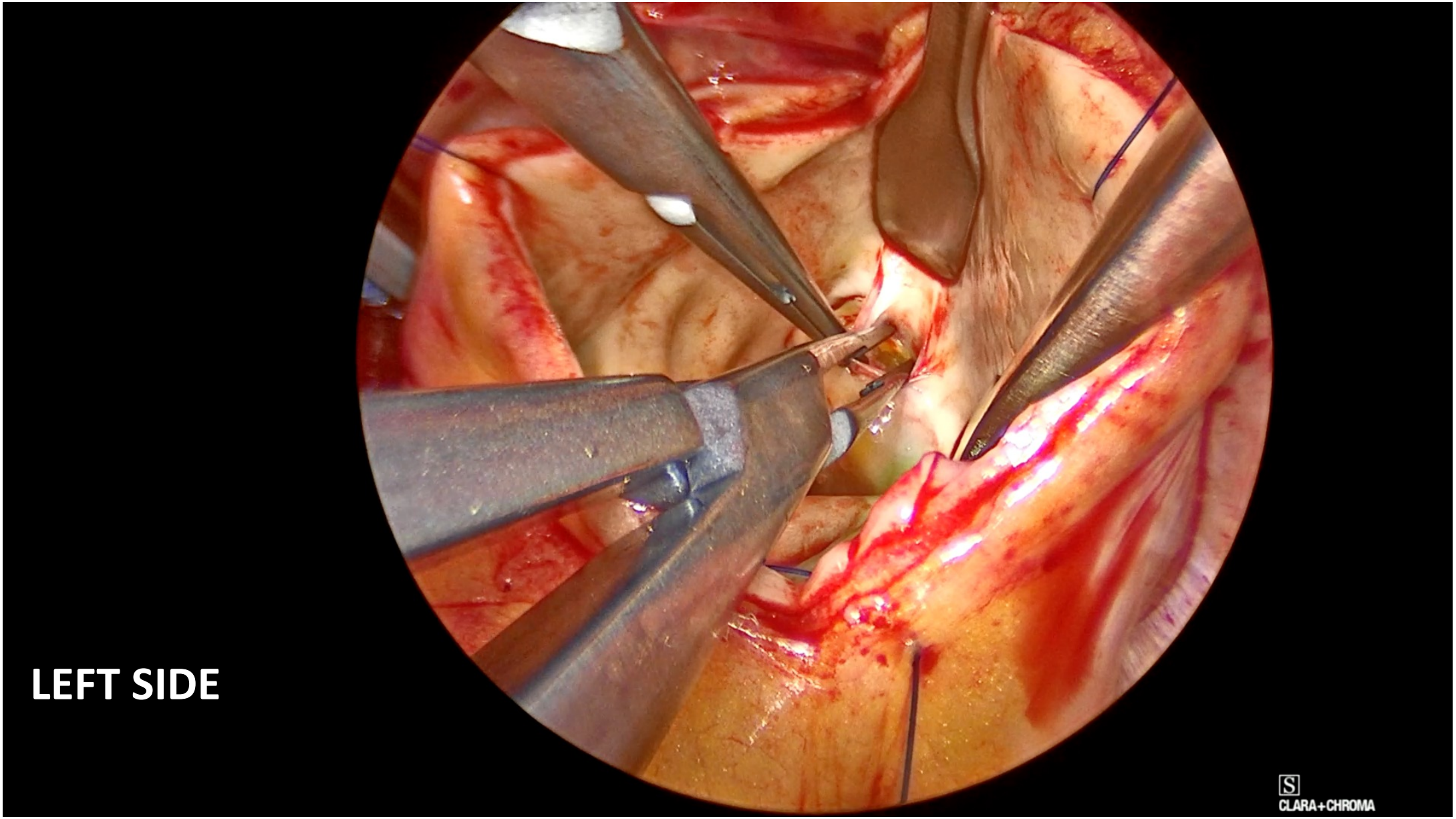
CLARA+CHROMA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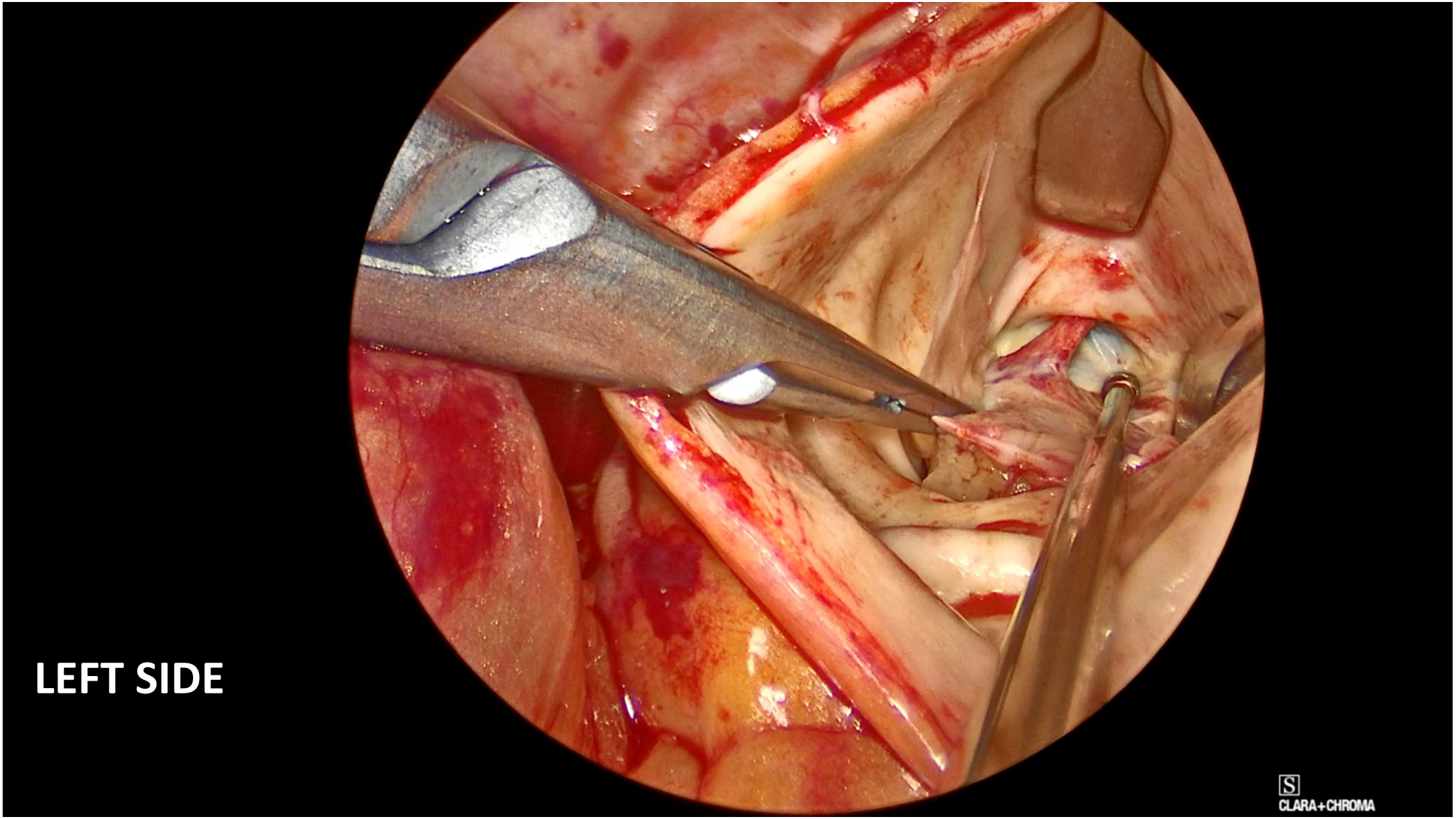
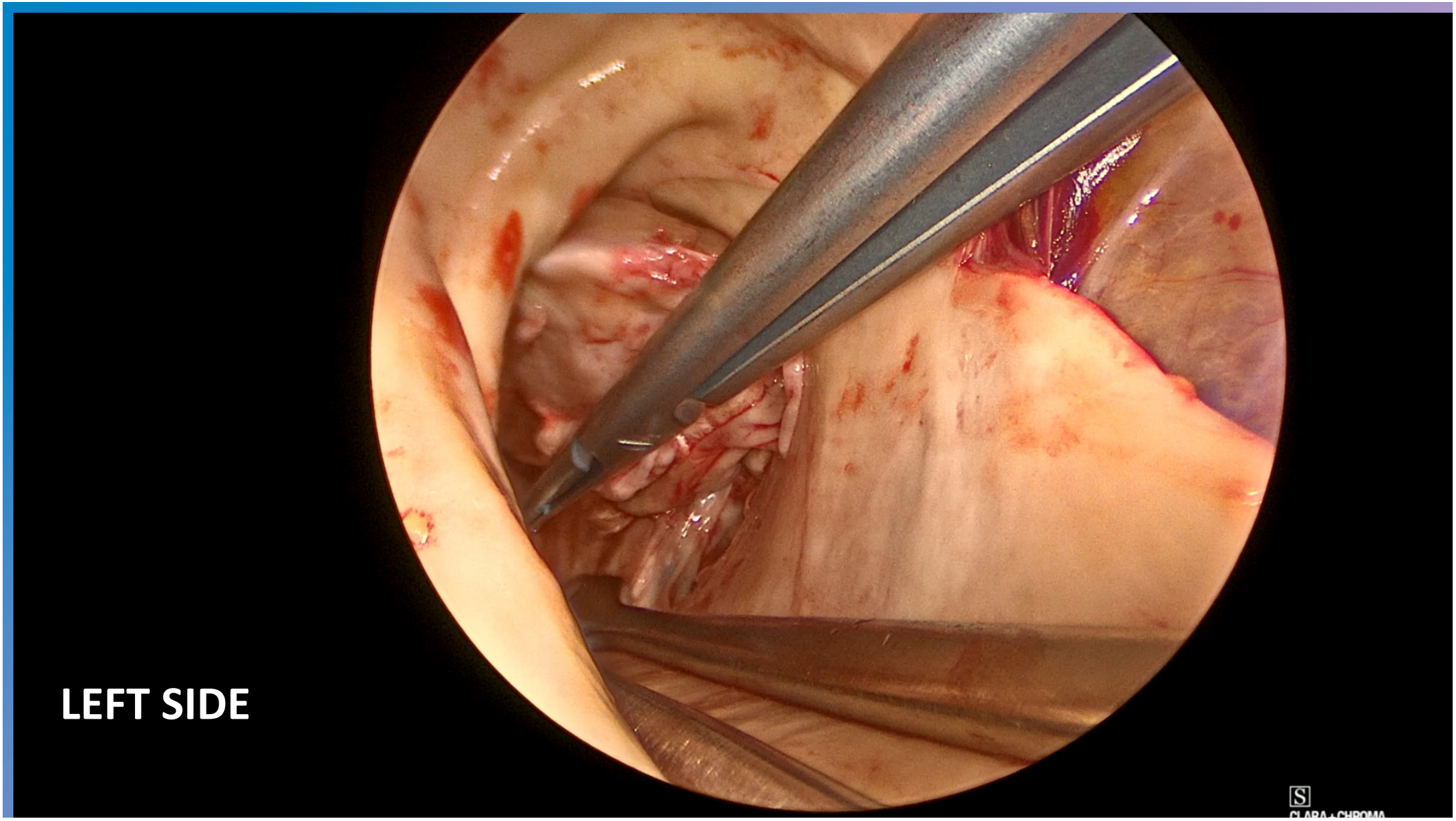
CLARA+CHROMA


LEFT SIDE
CLARA+CHROMA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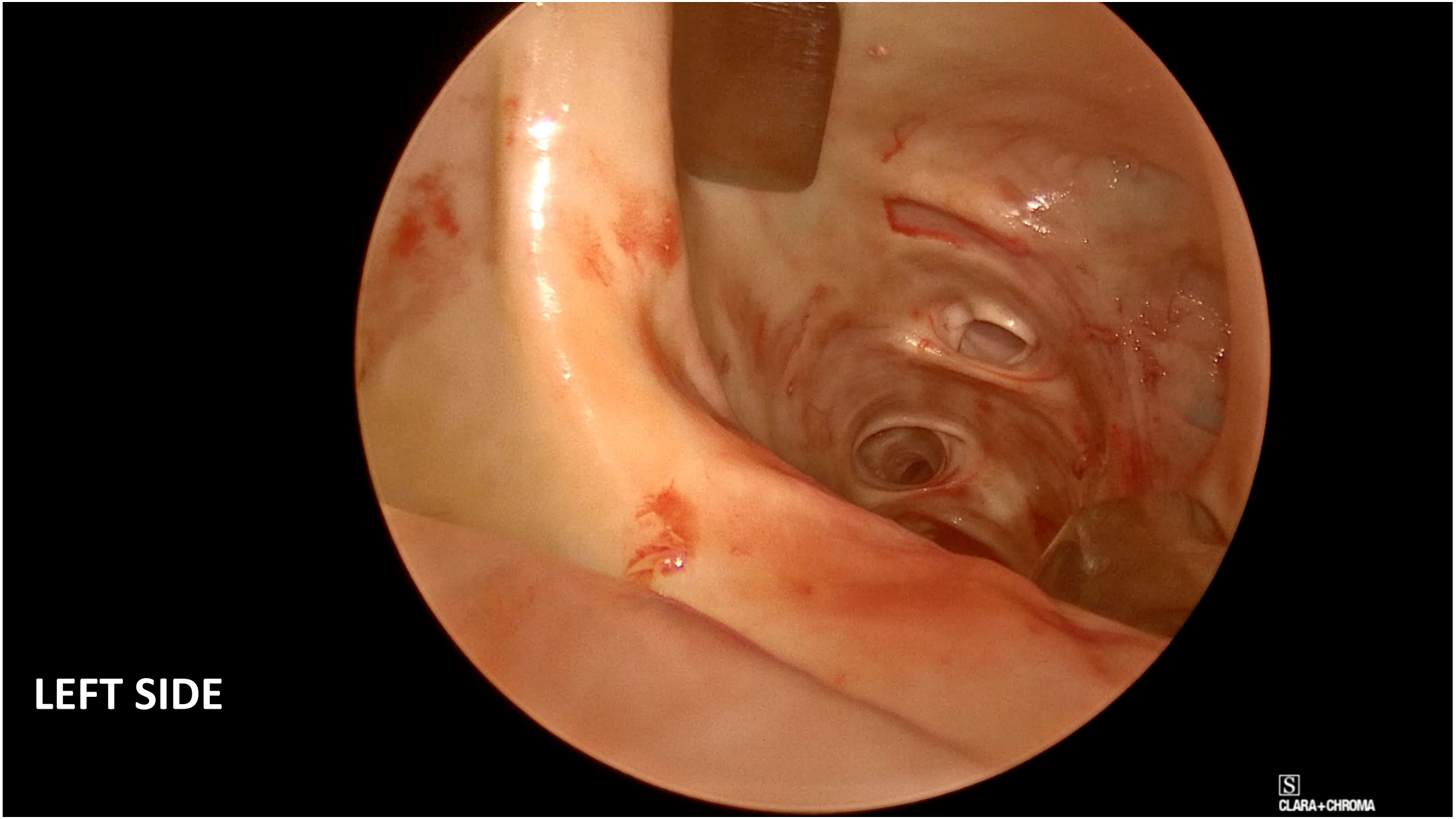
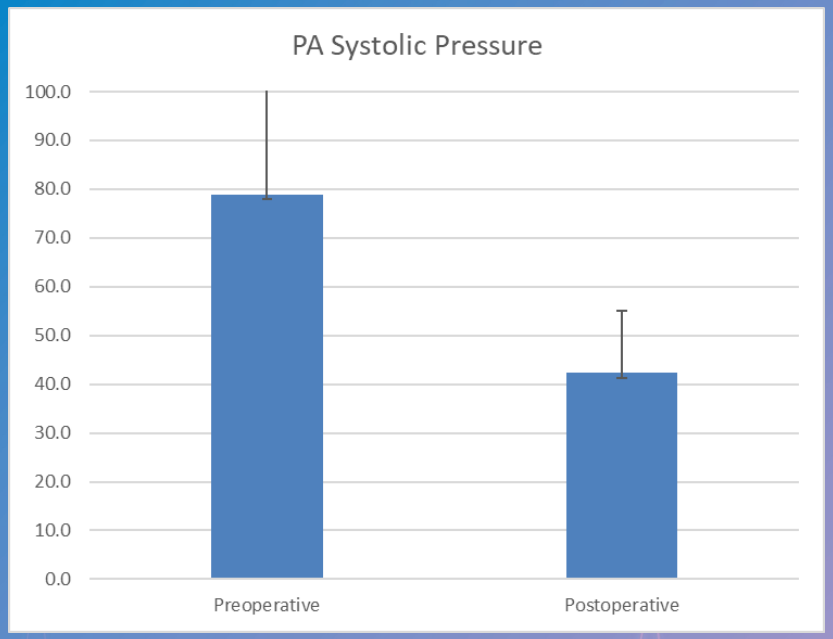

LEFT SIDE
CLARA+CHROMA

X clamp: 83 mins
HCA: 51 mins

Post-op PA pressures:
30/14 (pre: 67/15)

Extubated POD 1
Discharged POD 5

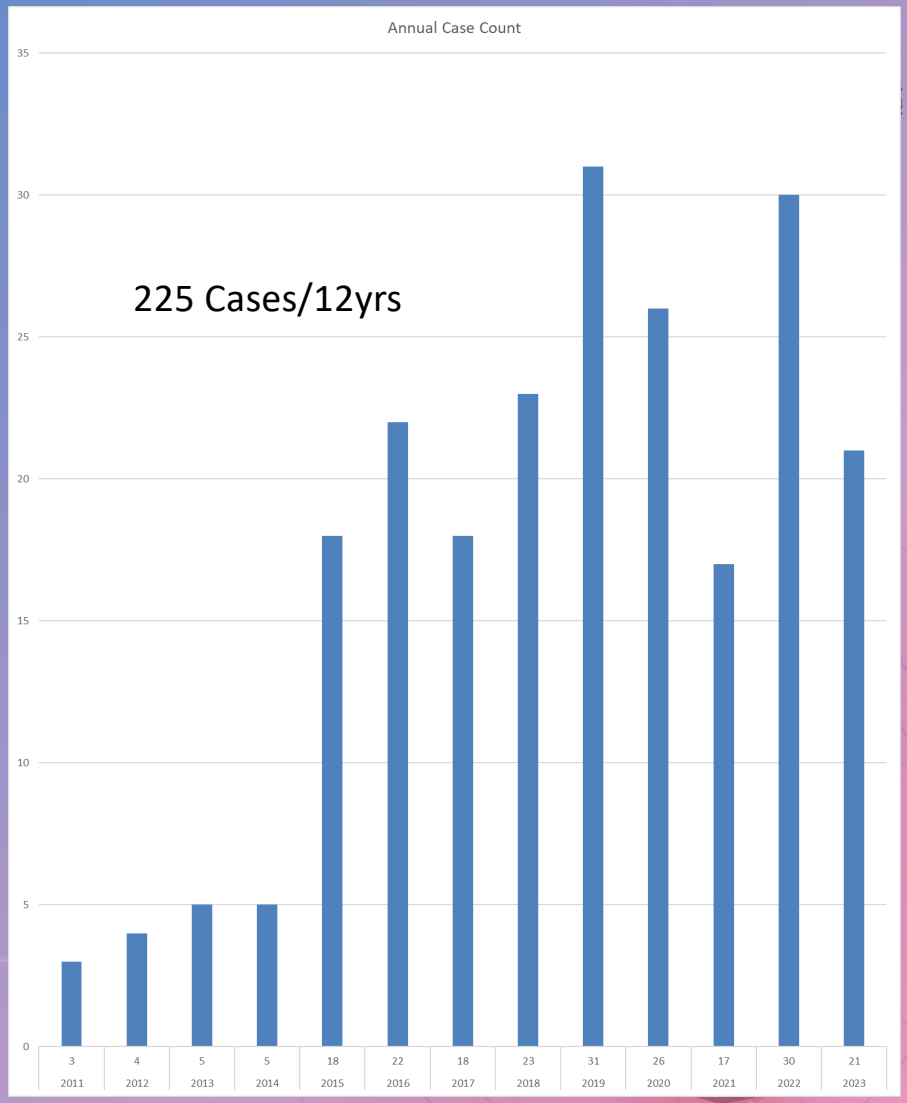
UM CTEPH PEA Program



Operative mortality 4.1%
(2-5% experience centers)

J Thorac Cardiovasc Surg. 2011 Mar;141(3):702-10. doi: 10.1016/j.jtcvs.2010.11.024

Ann Thorac Surg. 2012 Jul;94(1):97-103; discussion 103. doi: 10.1016/j.athoracsur.2012.04.004. Epub 2012 May 23



Annual Case Count

Take Away

1. CTEPH is an underdiagnosed and
   a Fatal Disease if left untreated
2. PEA- only potential cure for CTEPH
3. PEA - Steep Learning Curve
4. In-Hospital Mortality Rate (<5%) with HVC.

ATCSA2023
Ho Chi Minh city, Vietnam

ISMICS
The International Society for Minimally Invasive Cardiothoracic Surgery

Thank You

Xin chân thành cảm ơn!

"Ta về ta tắm ao ta dù trong dù đục ao nhà vẫn hơn!"