

# Total Personal Brain Perfusion “Warm Brain, Cold Body”

(Penza Arch Technology)

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# axiom – open distal anastomosis

- **Circulatory arrest**

- profound
- deep
- moderate

- **Brain protection**

- profound without perfusion
- deep or profound + retrograde perfusion
- different hypothermia + antegrade perfusion

- **Antegrade brain perfusion**

- unilateral
- bilateral
- total
- total personal

- **Arch and vessels**

- nothing
- hemiarch
- full arch
- “island”
- “branch”

- **Cannulation site**

- right SA
- femoral artery
- direct aortic
- Inomate artery

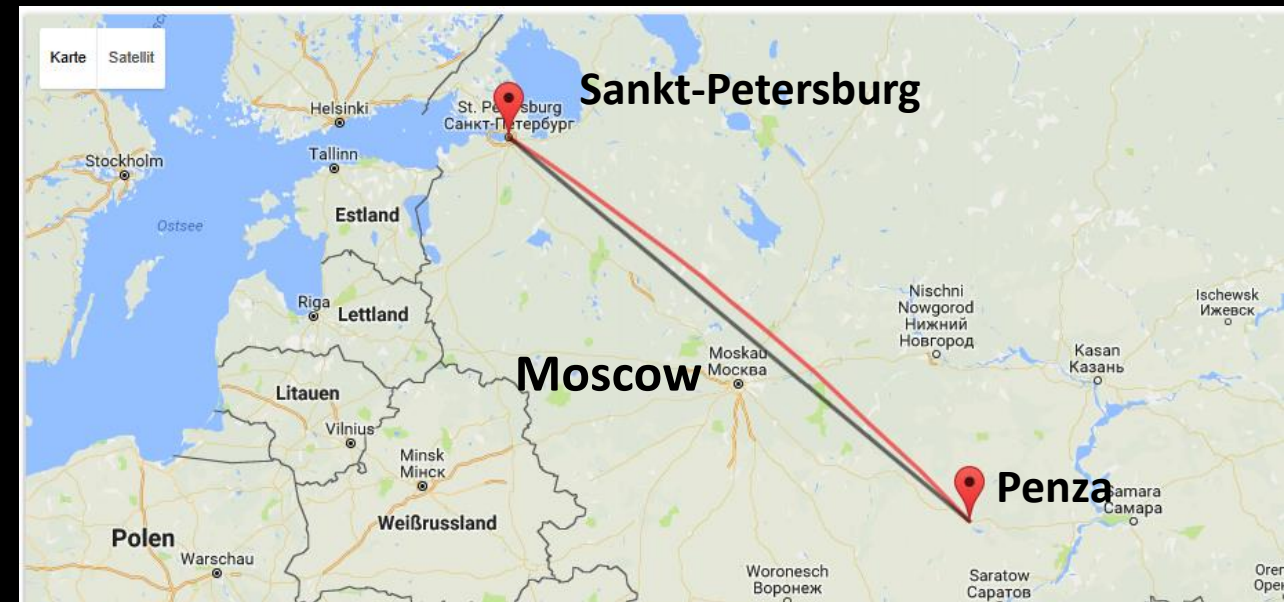
?????

- **Descending aorta**

- nothing
- «elephant trunk»
- FET

# Penza Arch Technology

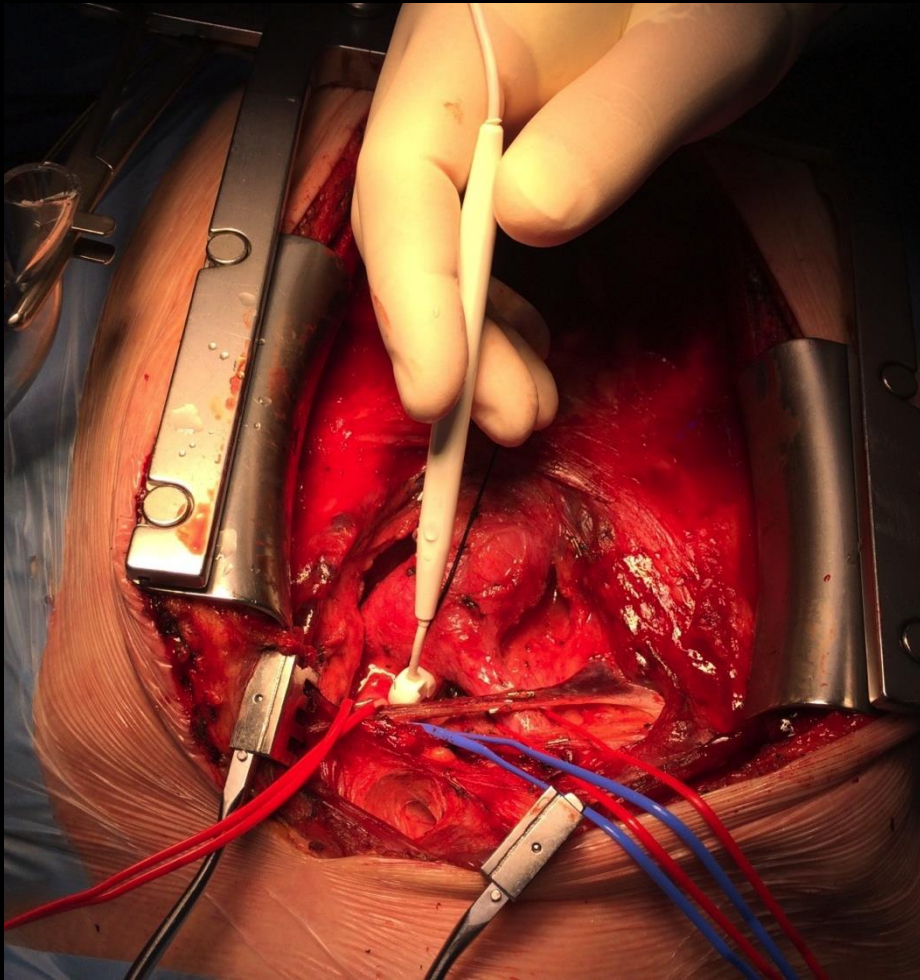
1. Total Personal brain perfusion
2. SEPARATE BYPASS CIRCUITS for brain perfusion
3. “opposite branch-first”
4. Penza cannulation



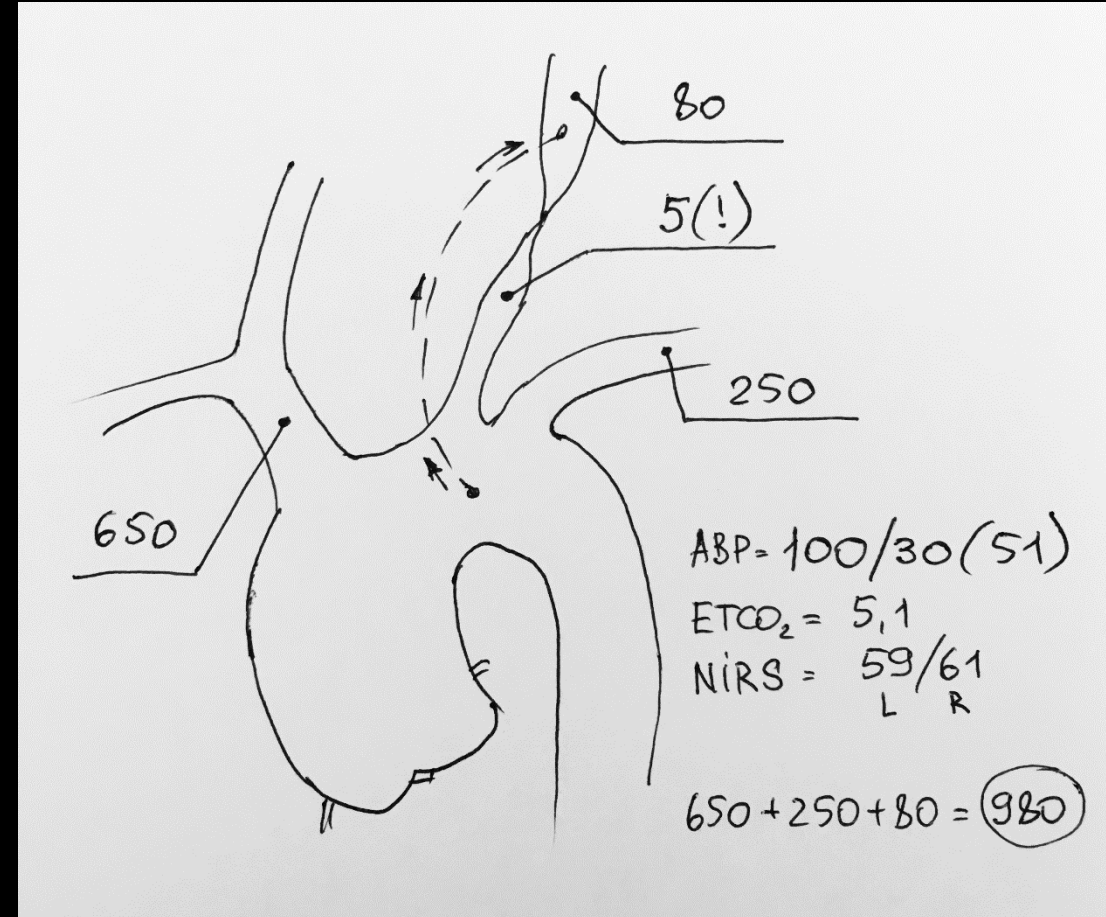
# Total Personal brain perfusion

- **TOTAL** – all branches of the aortic arch
- **PERSONAL** – volume of perfusion = volume of all branches

## FLOW MEASUREMENT OF BRACHIOCEPHALIC VESSELS



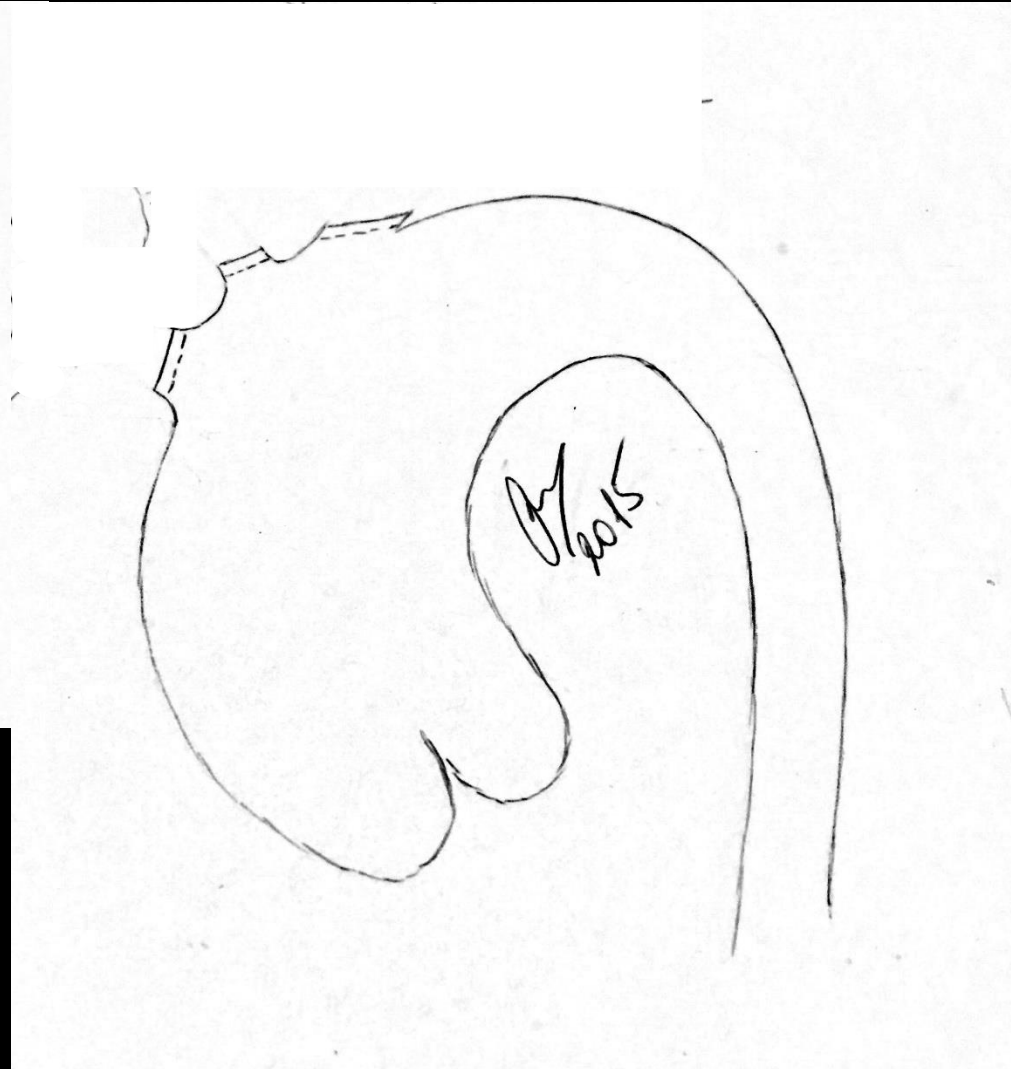
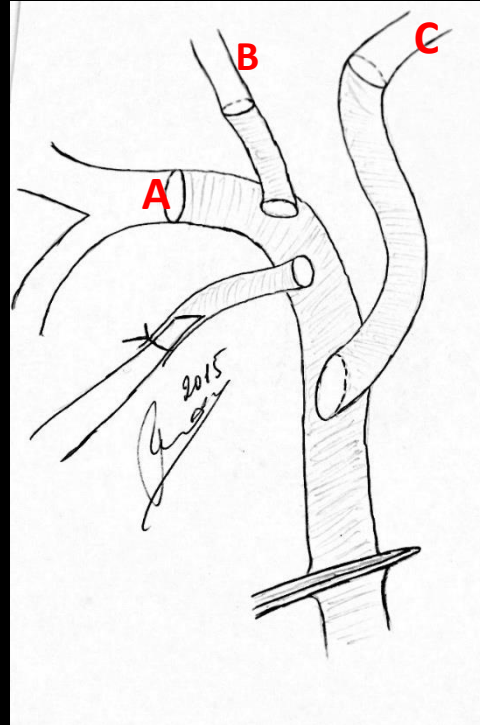
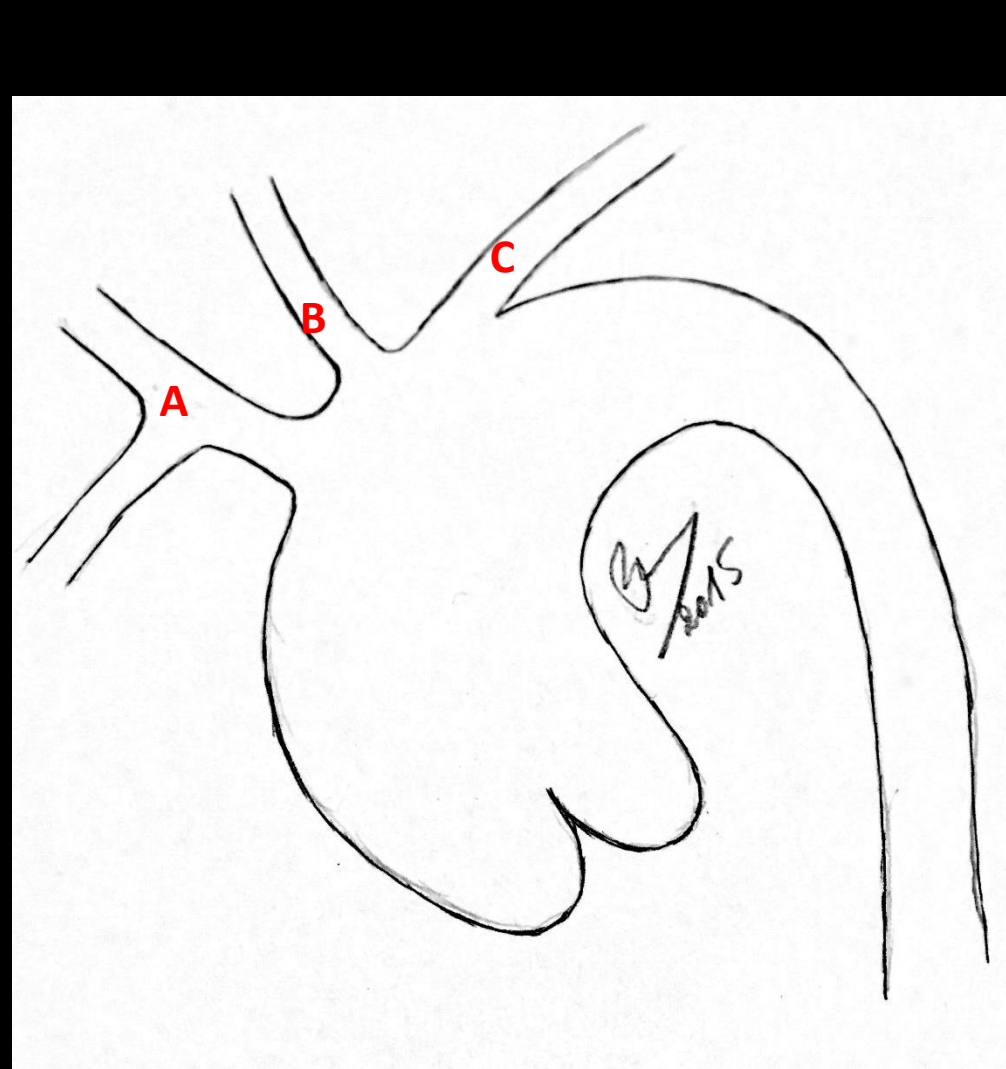
TTFM VeriQ  
ml / min





# TOTAL, PERSONAL brain perfusion

**A**, **B**, **C** – volume of the flow in BCA, LCCA and LSA



# Locus minoris

- Flow measurement  $t = 34-35$  ‘
- $t$  of circulatory arrest =  $24-26$  ‘

# Different temperature BRAIN – BODY

## “warm head, cold body”

Total Personal Brain Perfusion

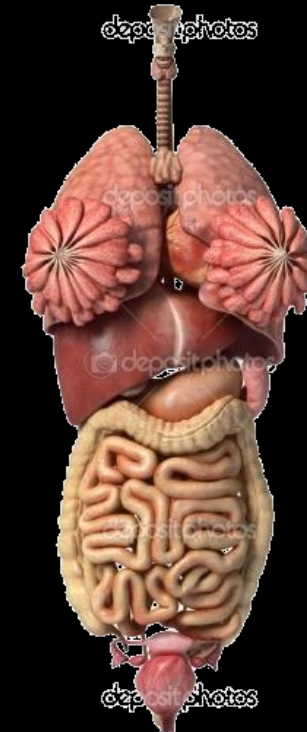


Centrifusial Pump  
Heat exchanger  
Normothermia  
Oxigation



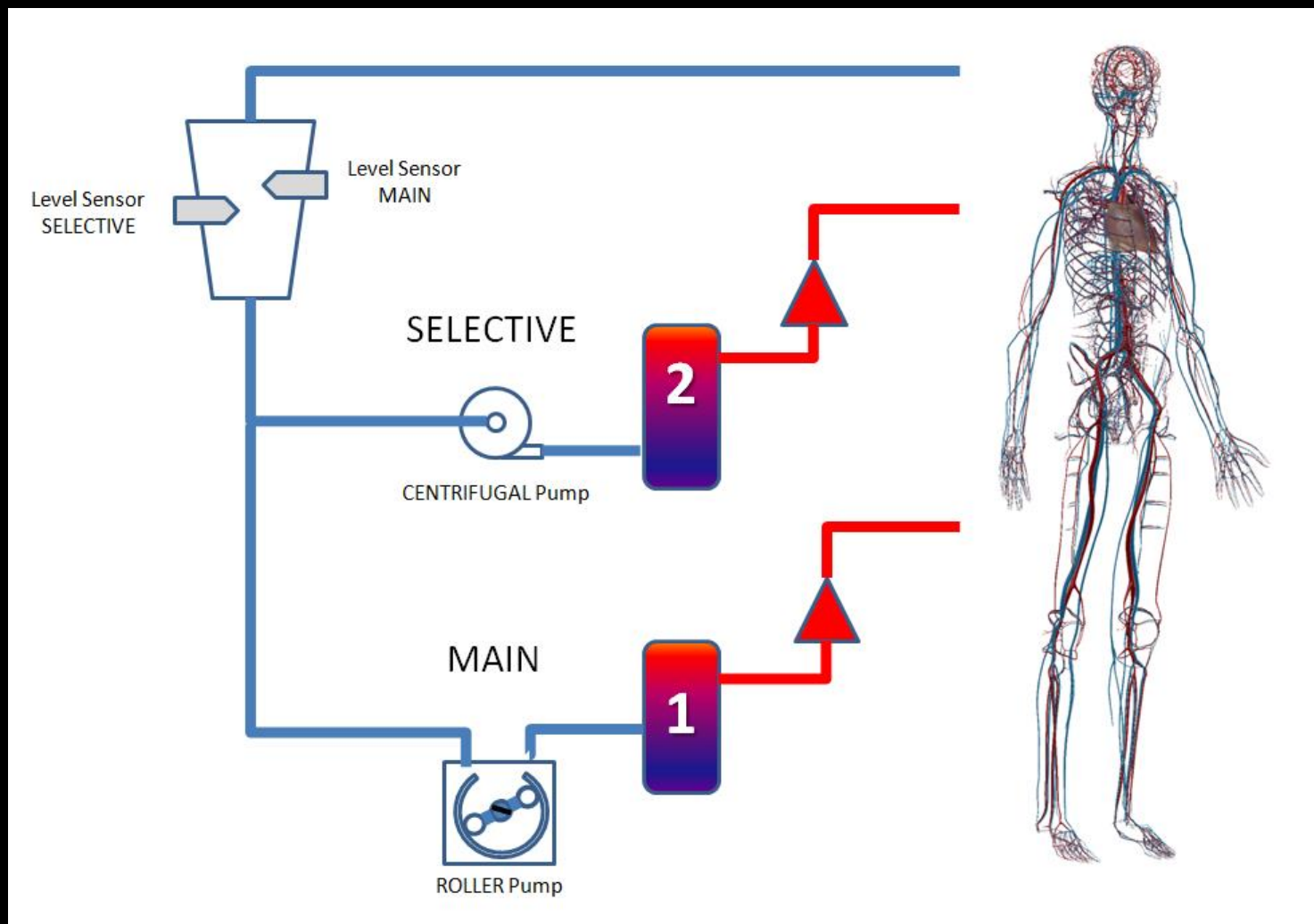
Oxigation  
Roller Pump  
Heat exchanger

24-26  
Circulatory arrest





## 2 SEPARATE BYPASS (CIRCUITS)





Brain temperature

Radialis l, r  
femoral

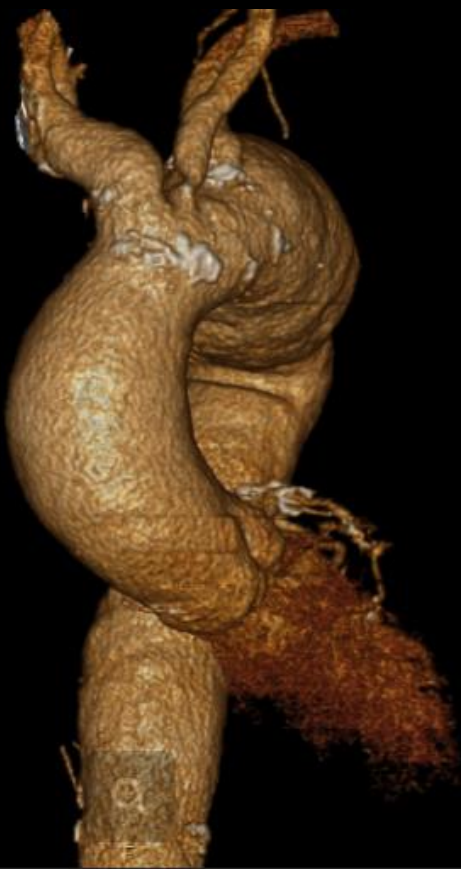
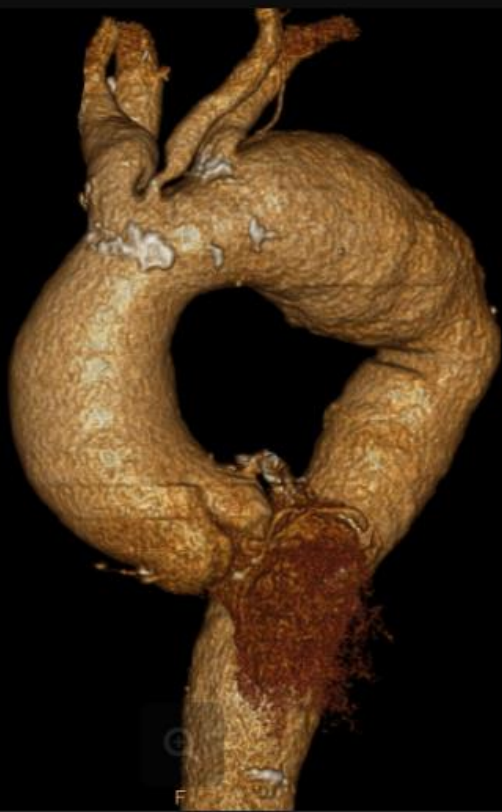
Body temperature - 26,2°C

**43 year old female.**

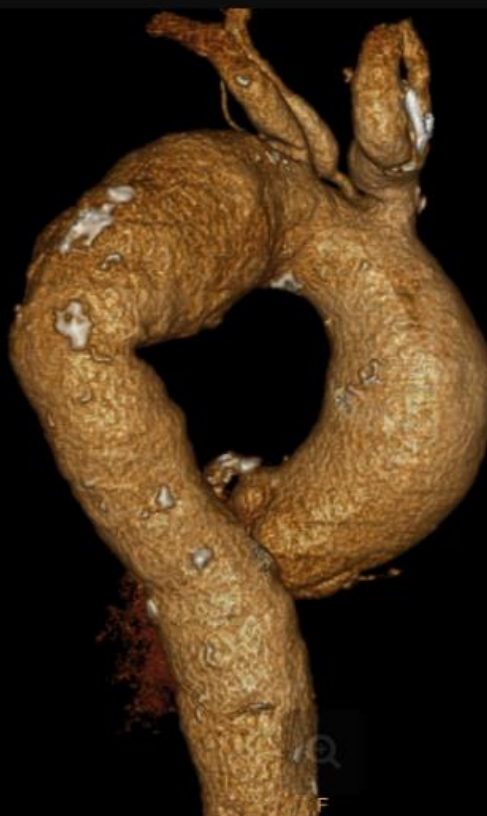
**Chronic aortic dissection type I (DeBakey).**

**Aortic regurgitation grade 3.**

**Marfan syndrome.**

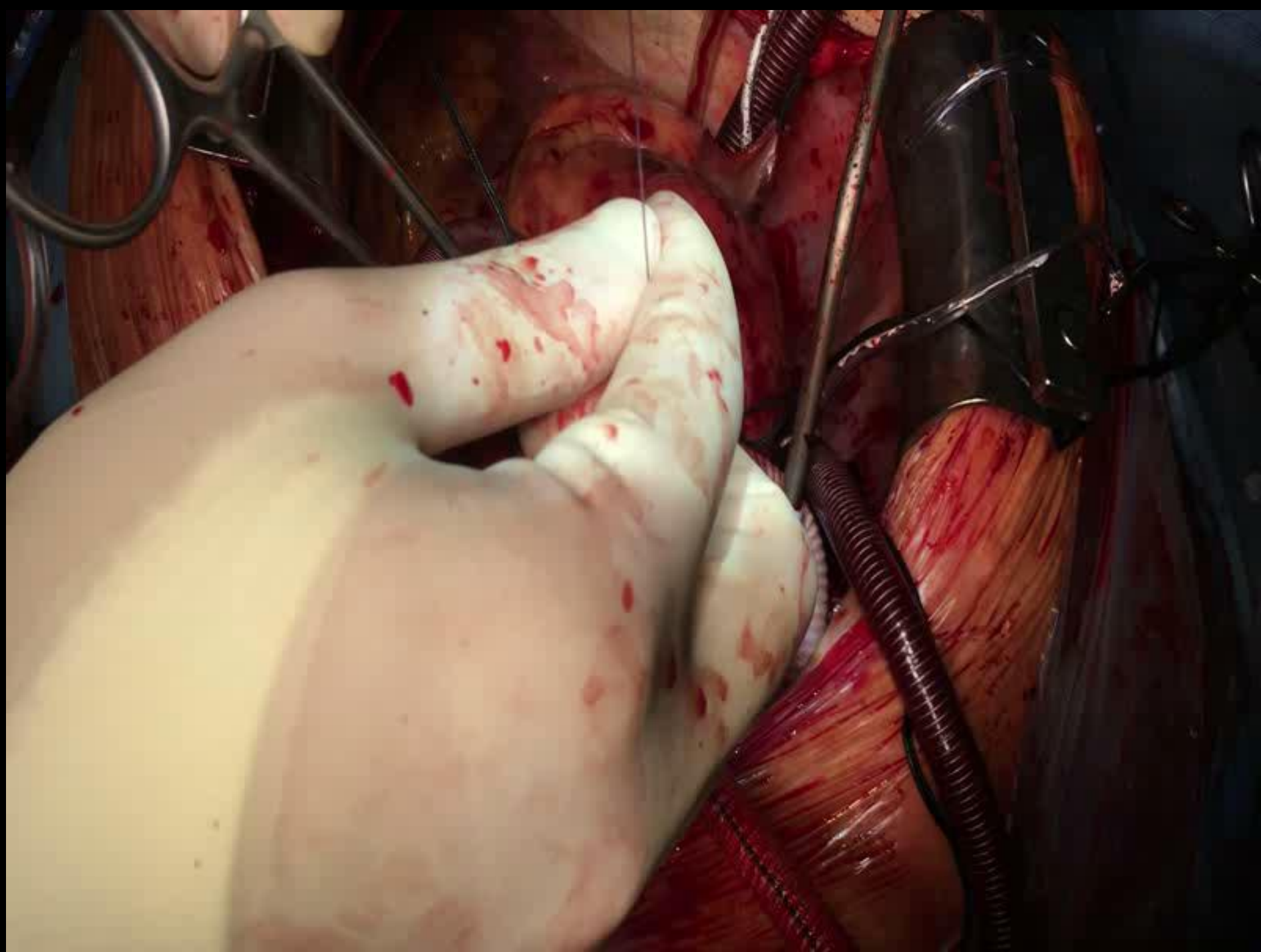


2016 / 11:56:00.40  
0.75 B25f 75%  
)  
ICT

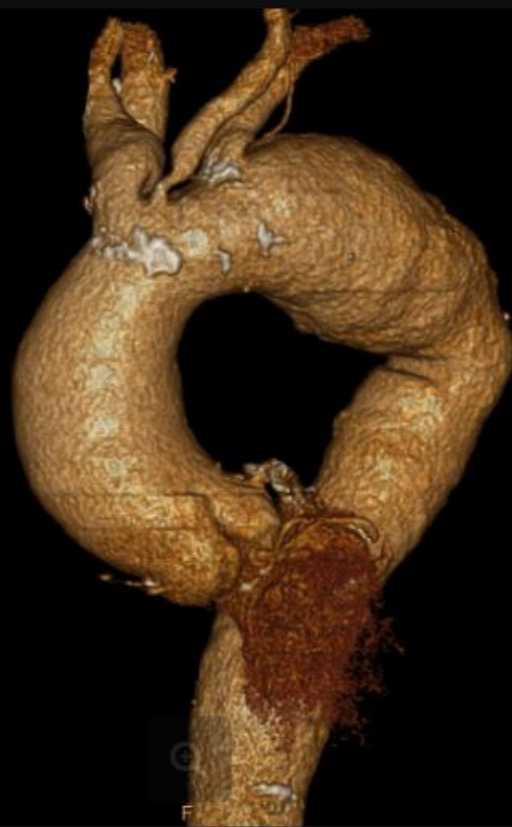


ность 49  
DS 1









5 Sep, 2016 / 10:51:13.84

ThorAngio2 1.0 B30f-2

Серия 9

Контраст

FGU FCSSH PENZA

SIEMENS, Sensation 64

Масштабирование 0,92

R

10 cm

Об. виз.

Прозрачность 49

CAROTIDS 1

Прозрачность 50

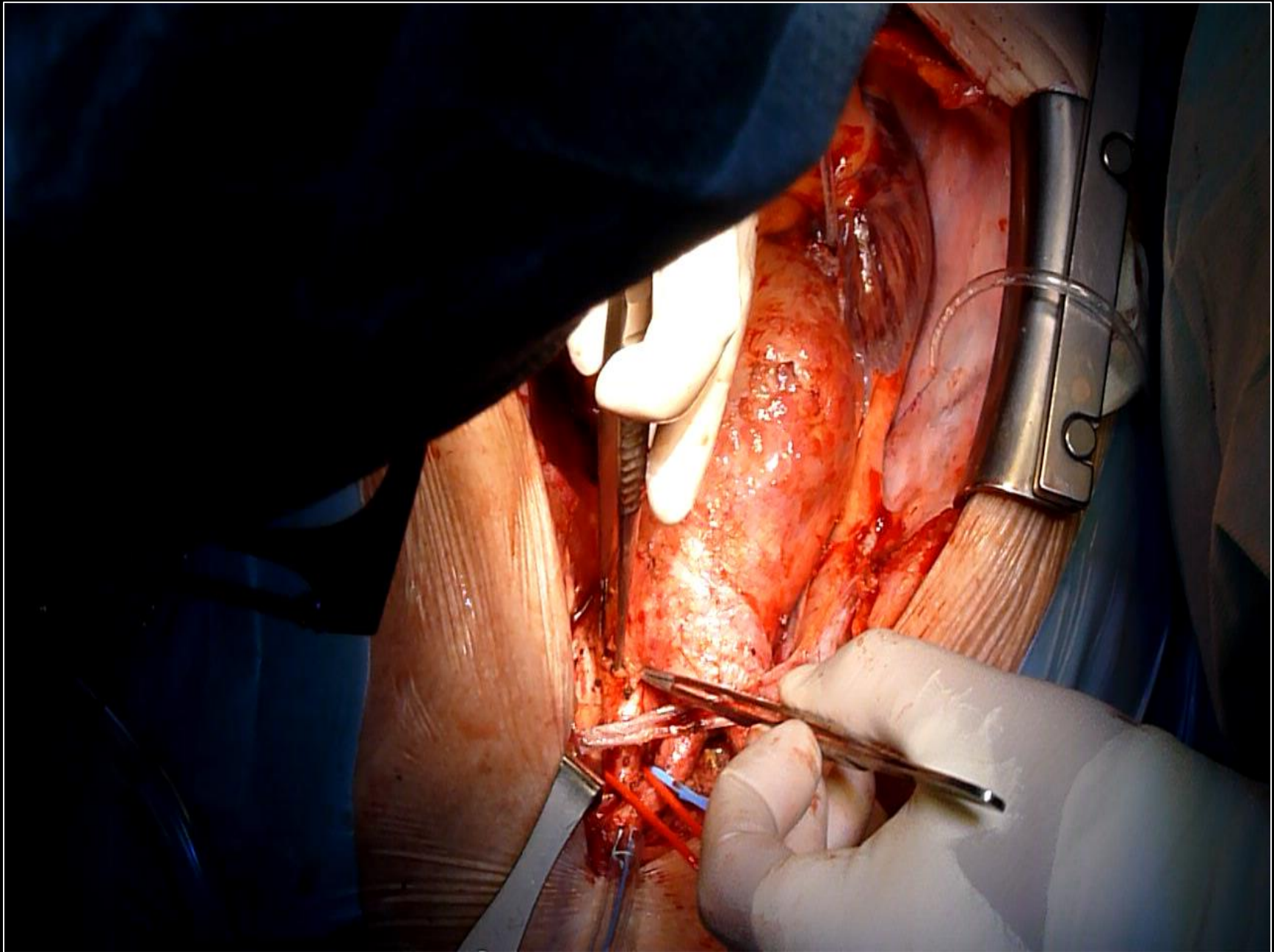
F



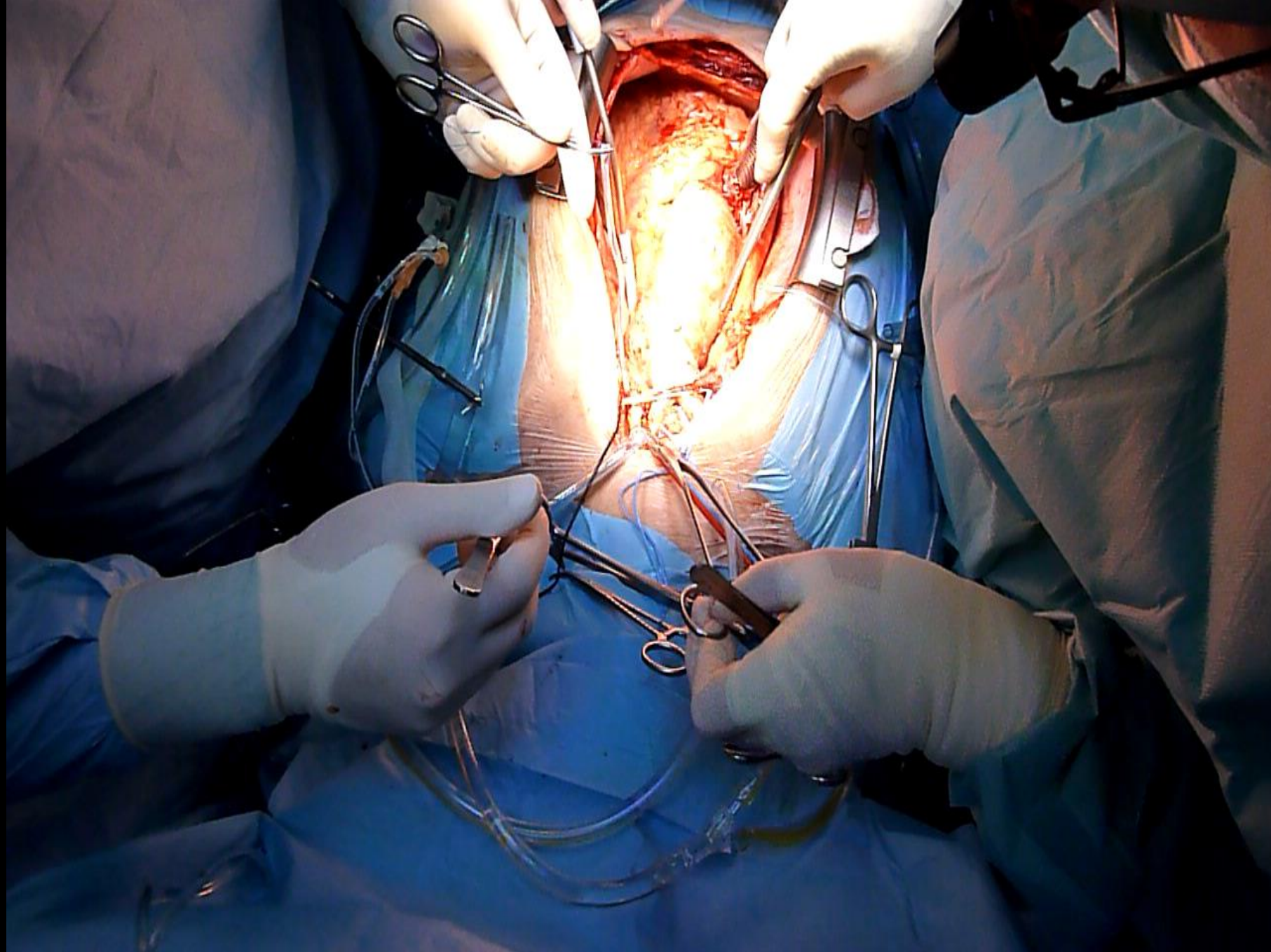
Угол 0, 0, 0 град.

# Penza cannulation

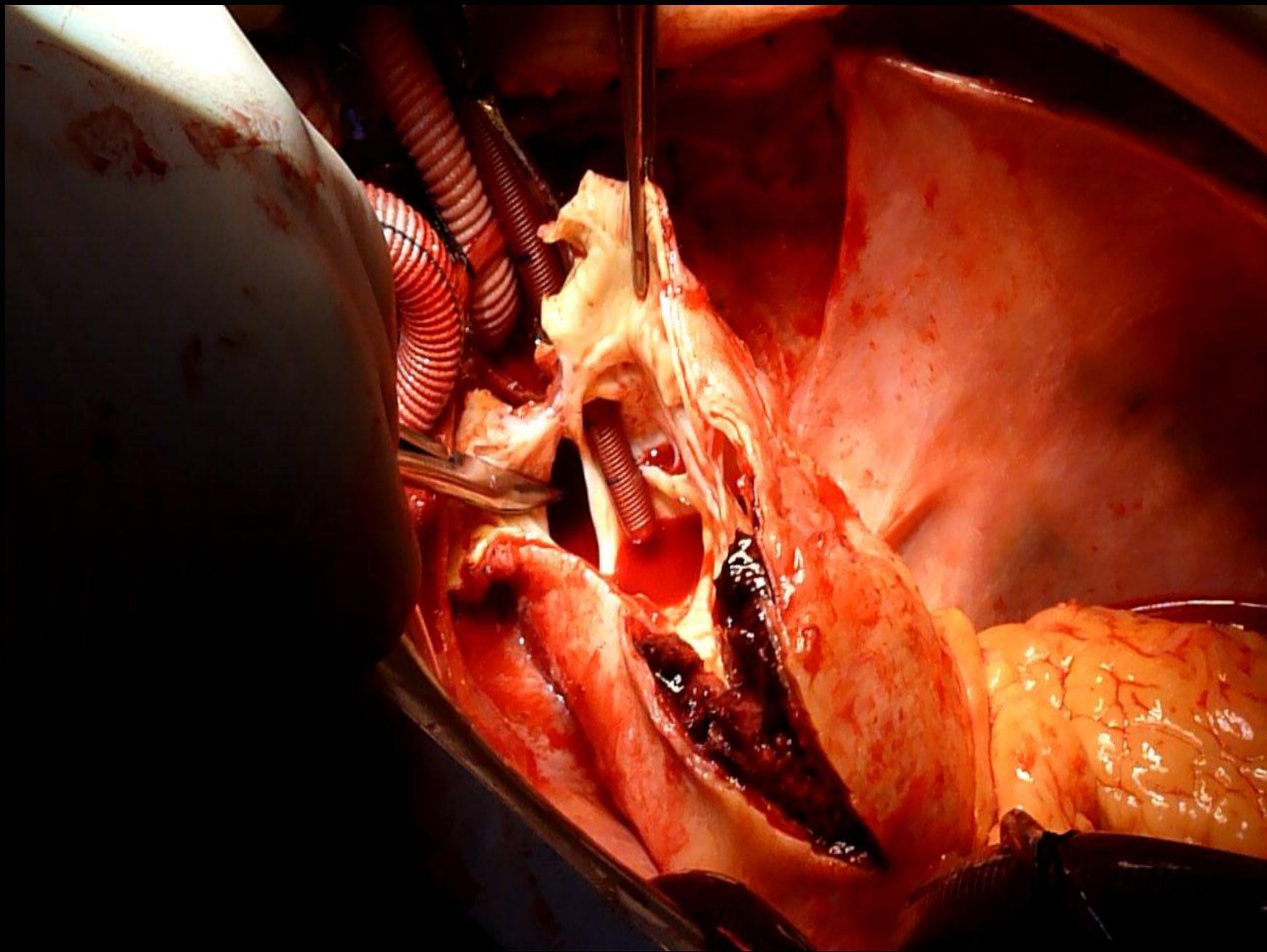
Another way

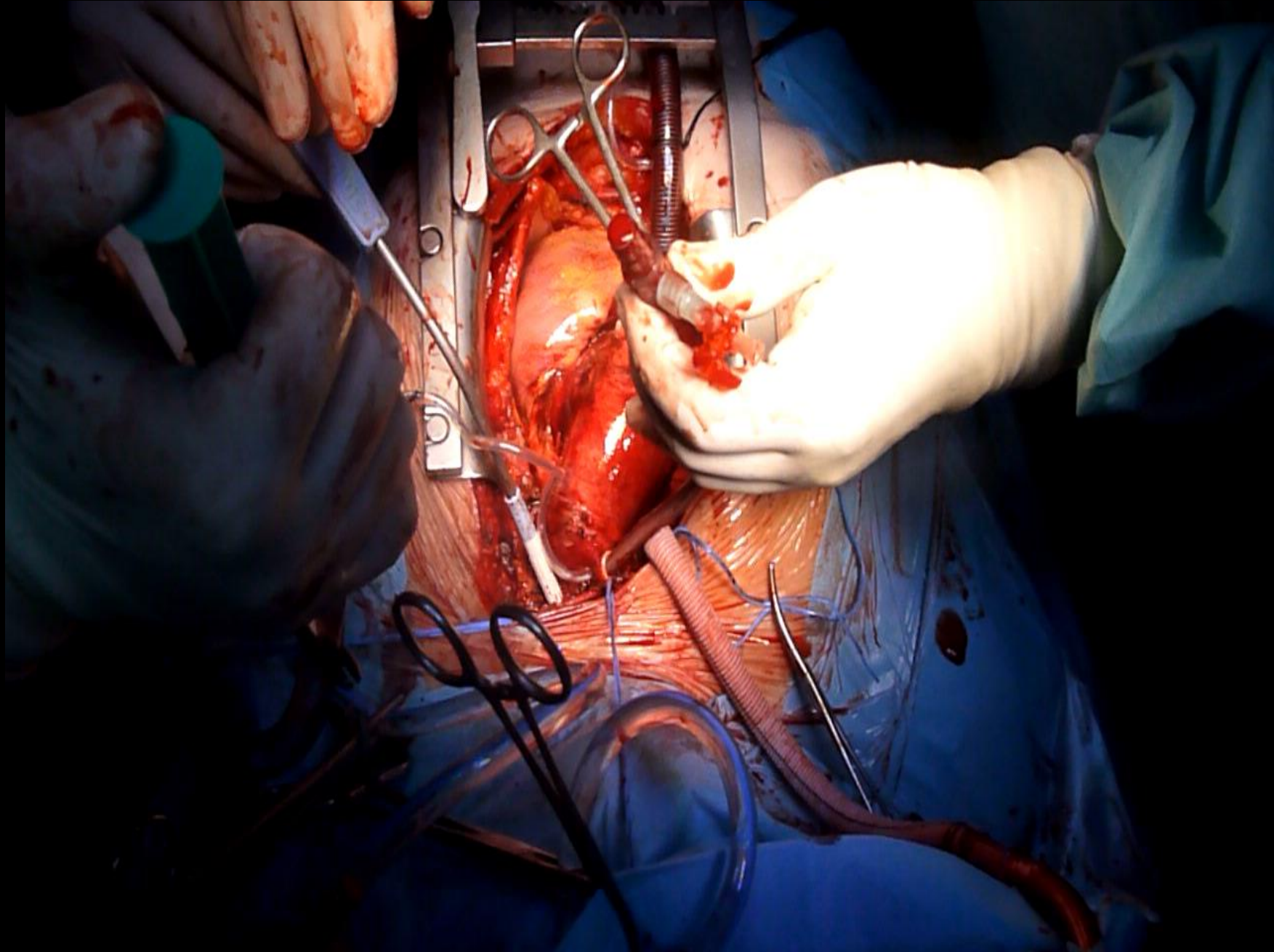




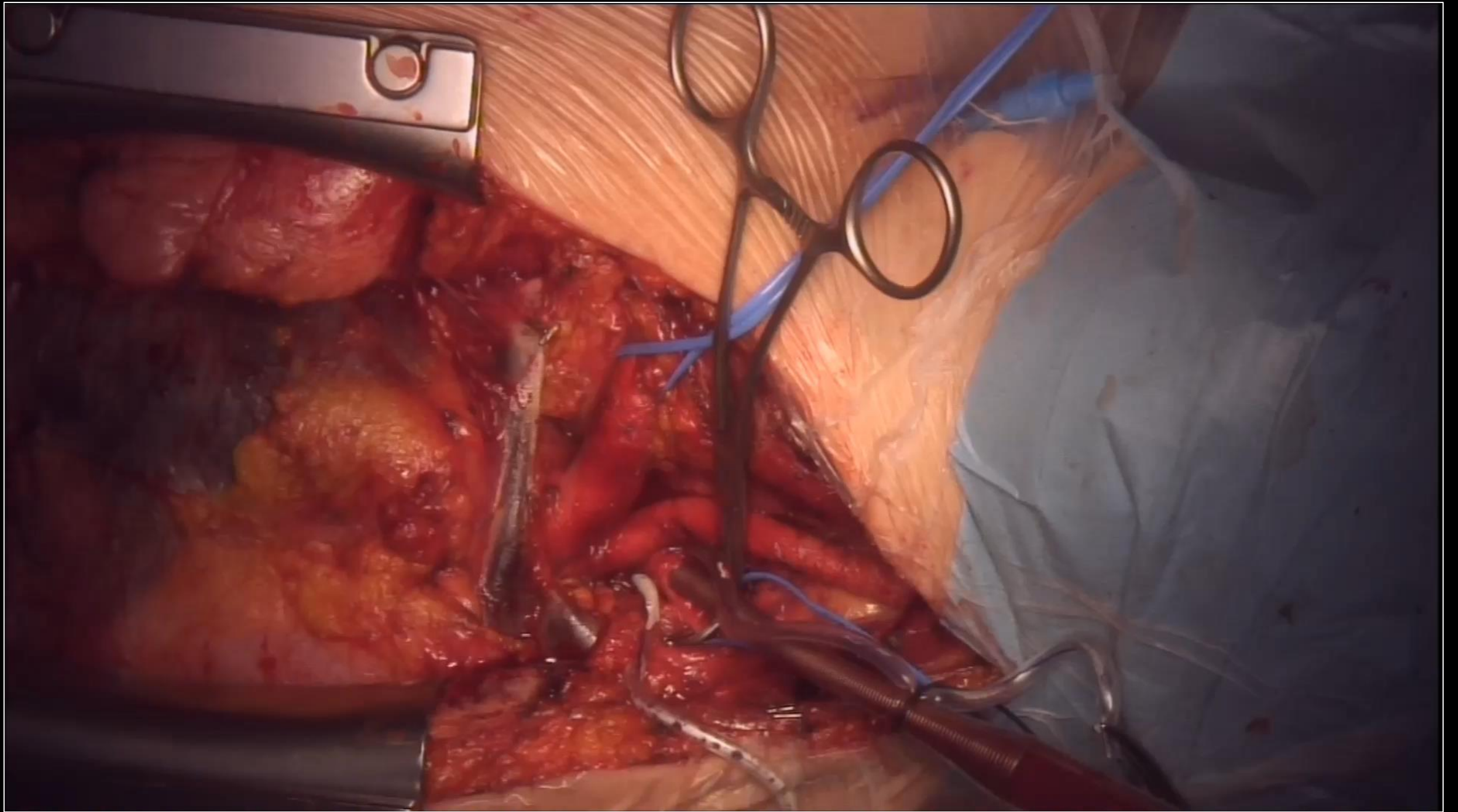


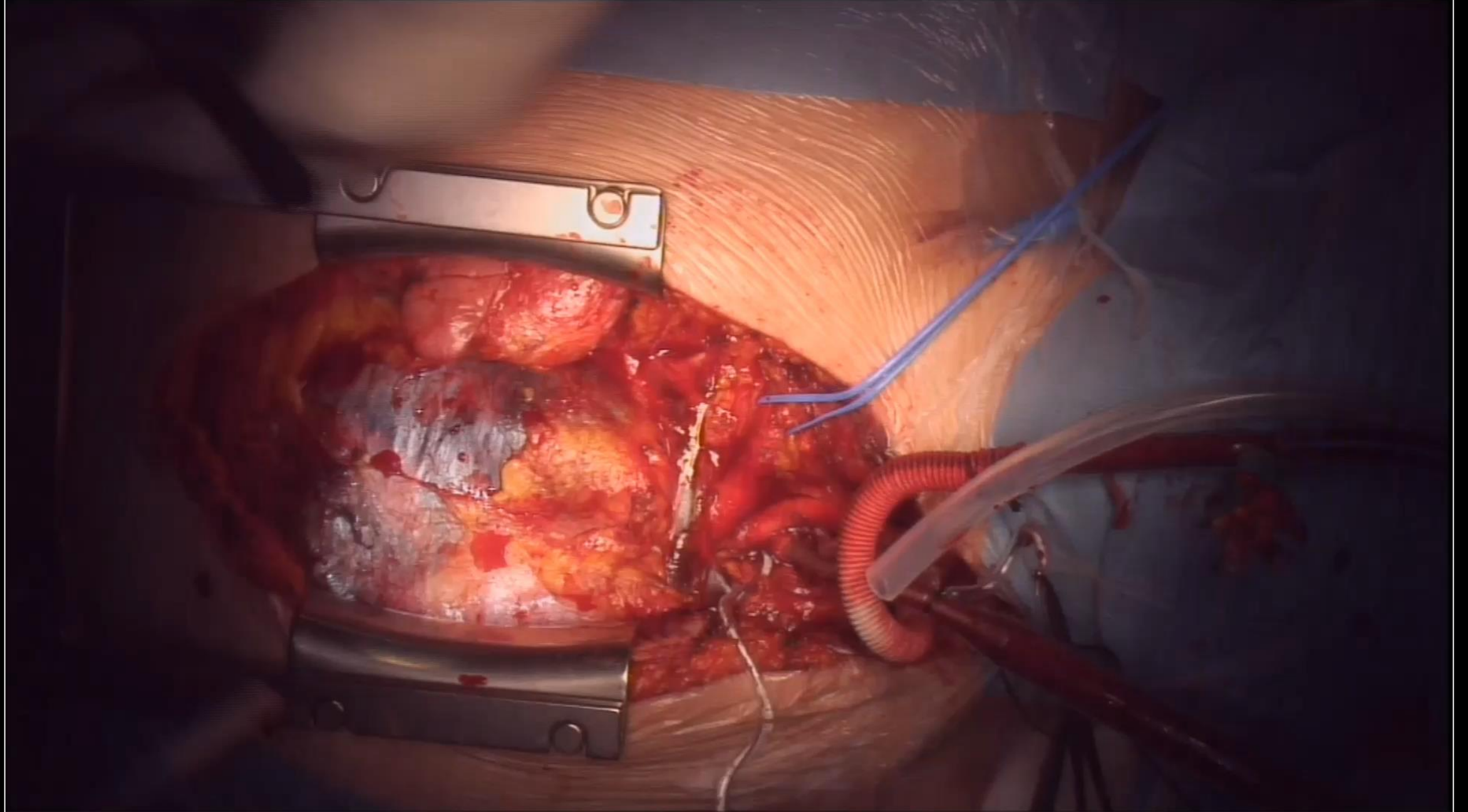












# Operative data

parametrs	results
patient	64
age	58.5 (23-73)
CPB time	<b>180</b> (105-257)
Total Personal Brain Perfusion	<b>145</b> (78-220)
Flow	1.1 (0.6 – 2.0)
Body circulatory arrest time	<b>24.5</b> (9 -55)
aneurysm	15 (9 – 19)
dissection	32 (25 – 55)
Temperature of body during CA	<b>24.5</b> (23 – 26.2)
Temperature of the brain during CA	<b>34.7</b> (31 – 36.2)



# Results

parametrs	results
patients	64
Mortality	0
Stroke permanent transient On 2 and 3 days after AF	1 (1.6%) 1 (1.6%)
Time before extubation	8.5 (3.6 – 49) hours
ICU time	72 ( 48 – 312) hours
Hospital	11 (7 – 48) days

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**- moderate for body only**

- Brain protection

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**- normothermia perfusion**

- Antegrade brain perfusion

- unilateral
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**- total personal**

- Arch and vessels

- nothing
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**- full arch**

- “island”

**- “branch”**

- Descending aorta

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- Cannulation site

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**- Penza cannulation**

# Penza Arch Technology

## ADVANTAGES

- Brain protection
  - Personal and really physiological
- Visceral organs protection
  - nice perfusion without vasopressors
  - + short CA time
- Spinal cord protection
  - always perfusion left subclavian artery
  - + short CA time
- Arch and vessels
  - universal, radical decision
- Descending aorta
  - very good “landing zone”

# Penza Arch Technology

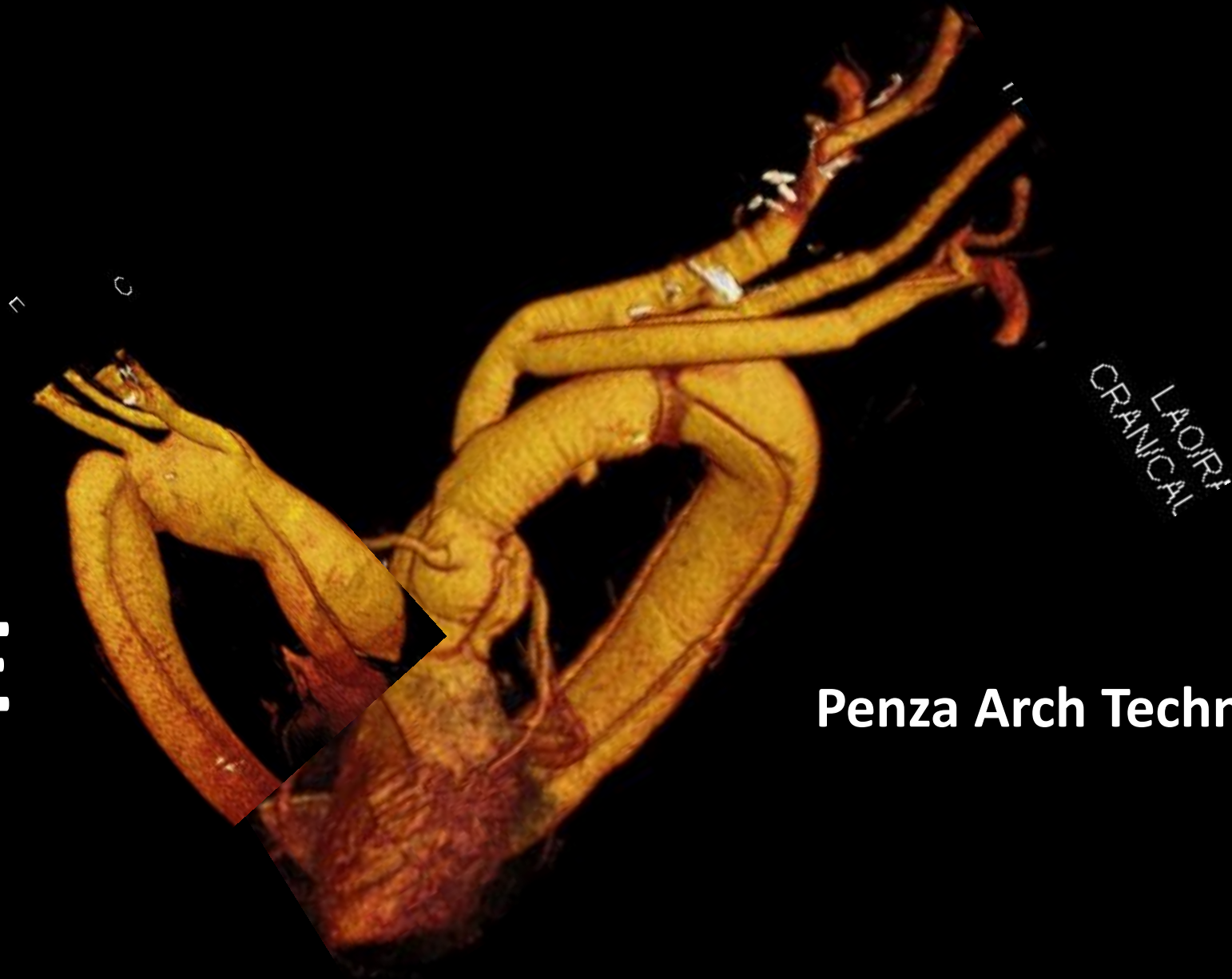
- For perfusionist
  - easy to learn and comfortable work
- For anesthesiologist
  - very comfortable work (brain, visceral, spinal cord protection) **1** (1.6%) dialys
- For surgeon
  - Comfortable conditions for surgery
    - Universal type of reconstruction of the arch (Marfan, dissection, plugs ...)
    - More easy hemostasis **4** (6.2%) reoperation for bleeding
    - Shorter time of CA **24** min
- For patient

# Penza Arch Technology

**Universal** technology,  
which we use in **all** clinical situation  
when the patient has the problems with  
aortic arch



**WE**



**Penza Arch Technology**

