Aortic Dissection

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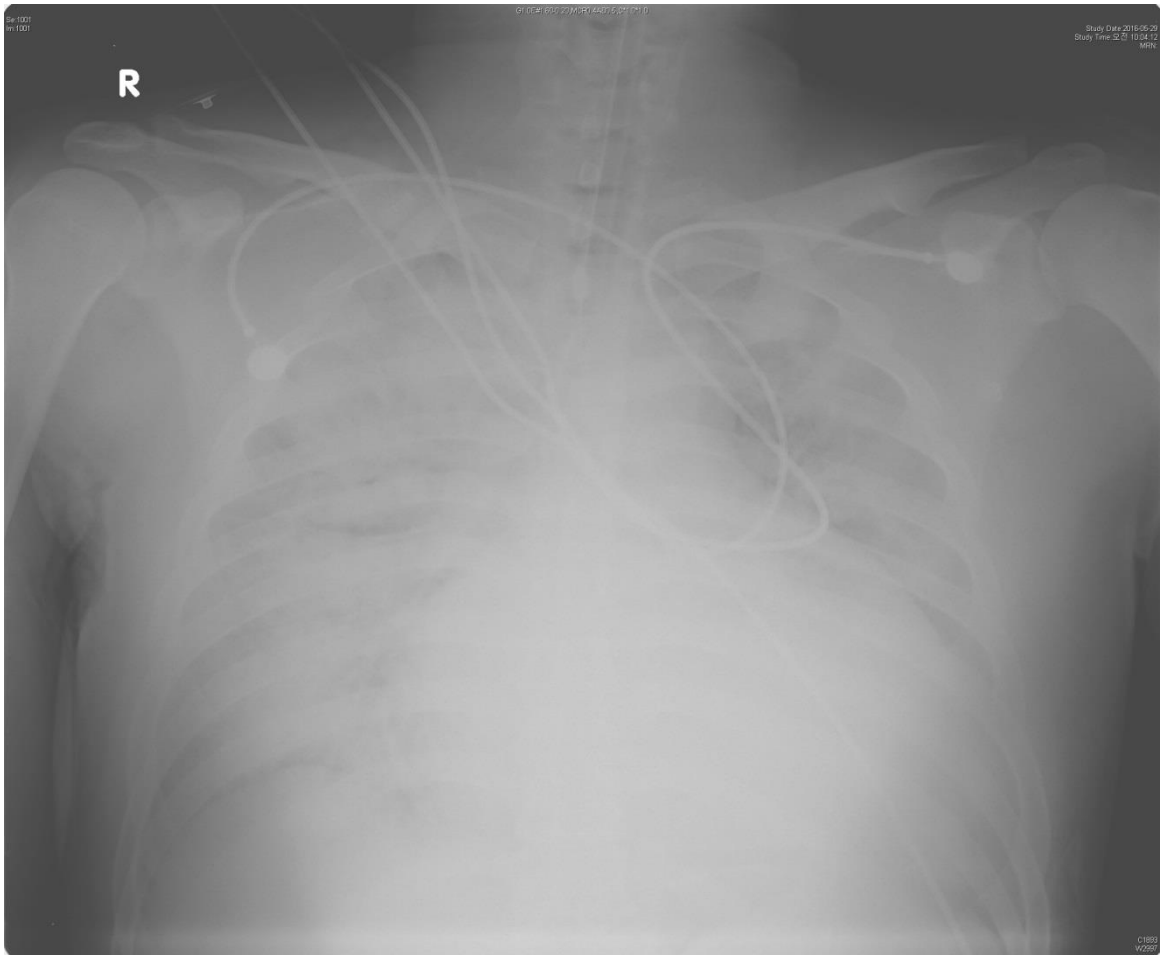
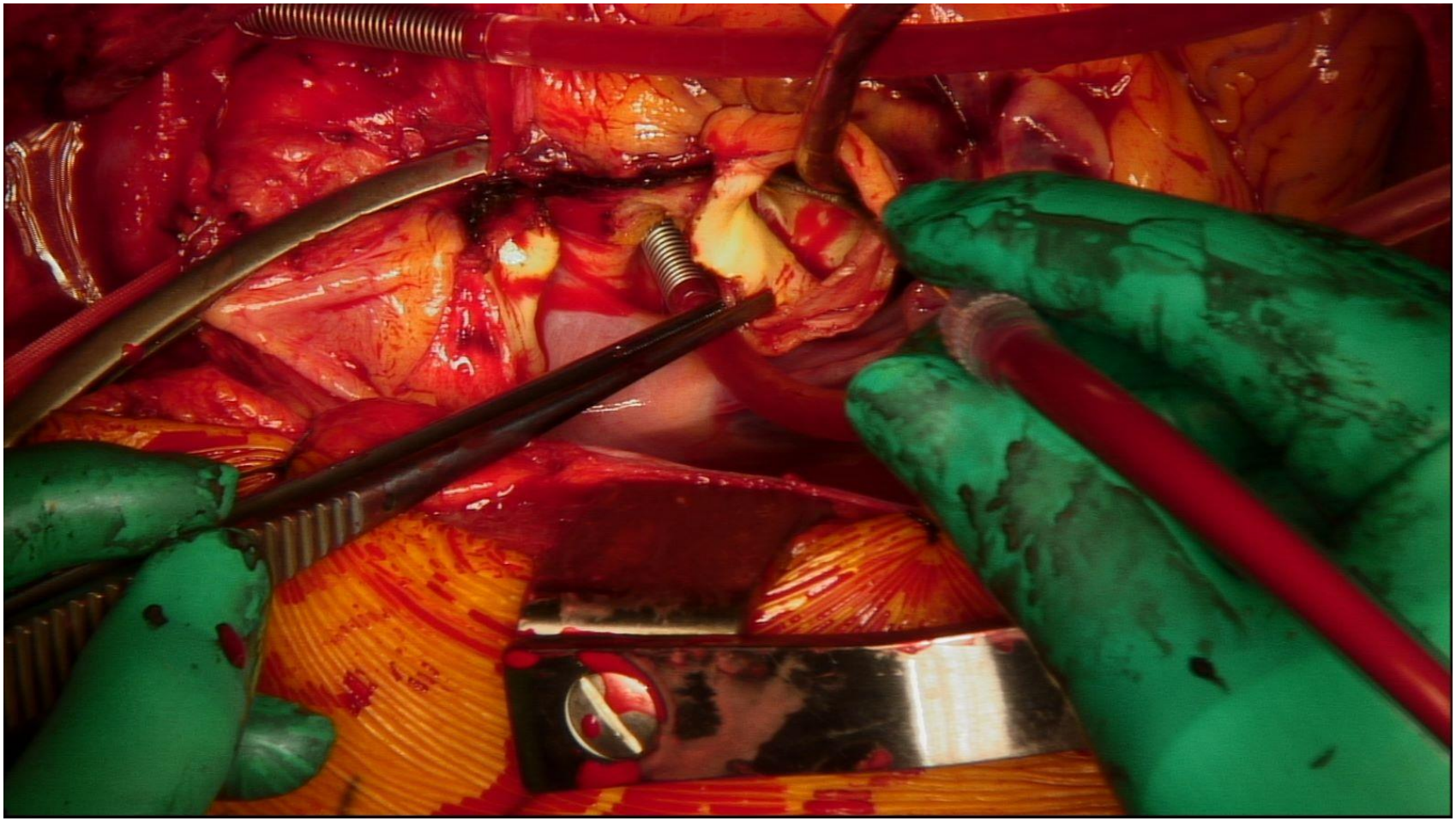
Preop shock with 3rd degree AV block (Aortic dissection, type I)

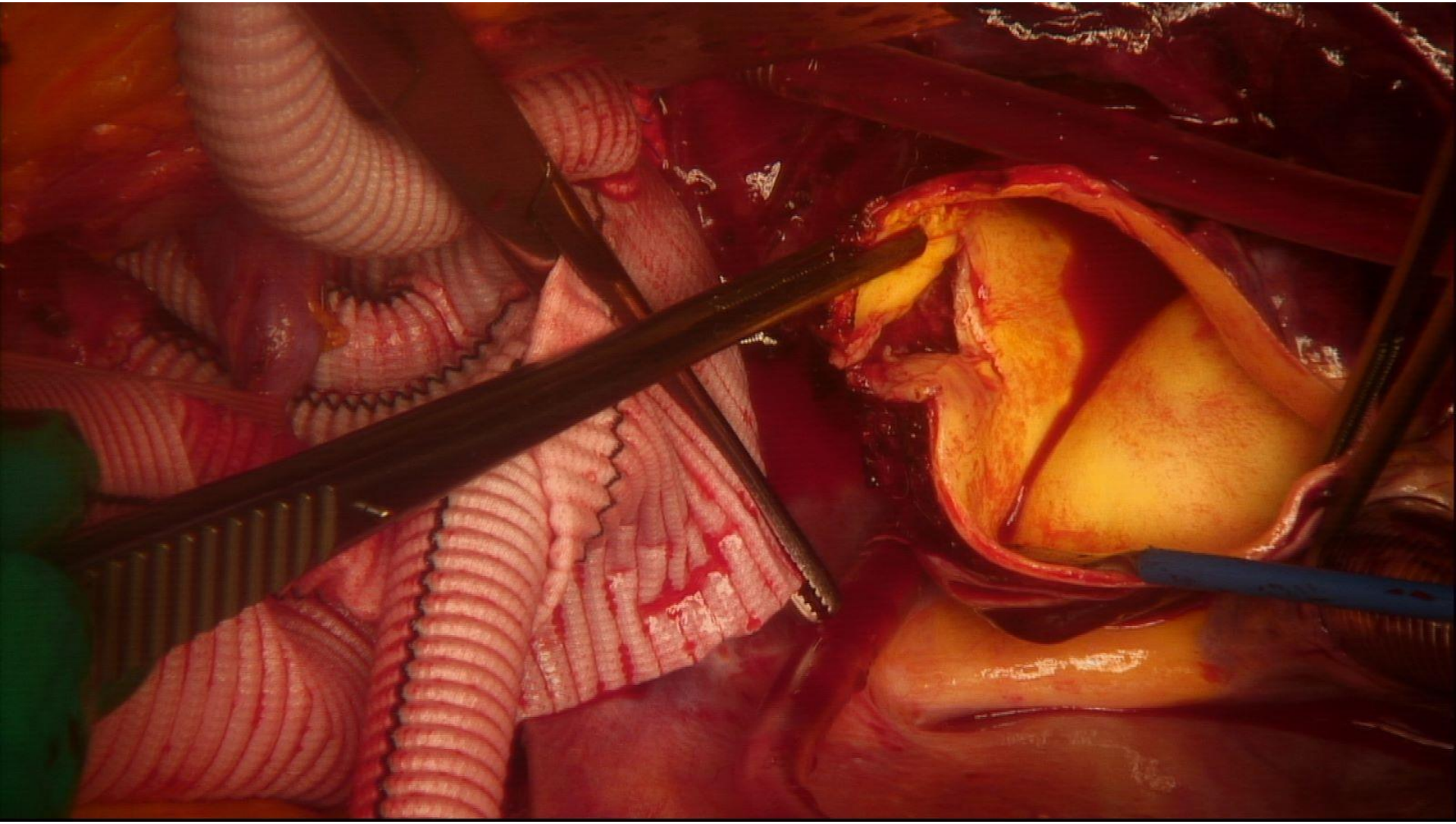
CPR CCTV movie

Preop. Chest x-ray

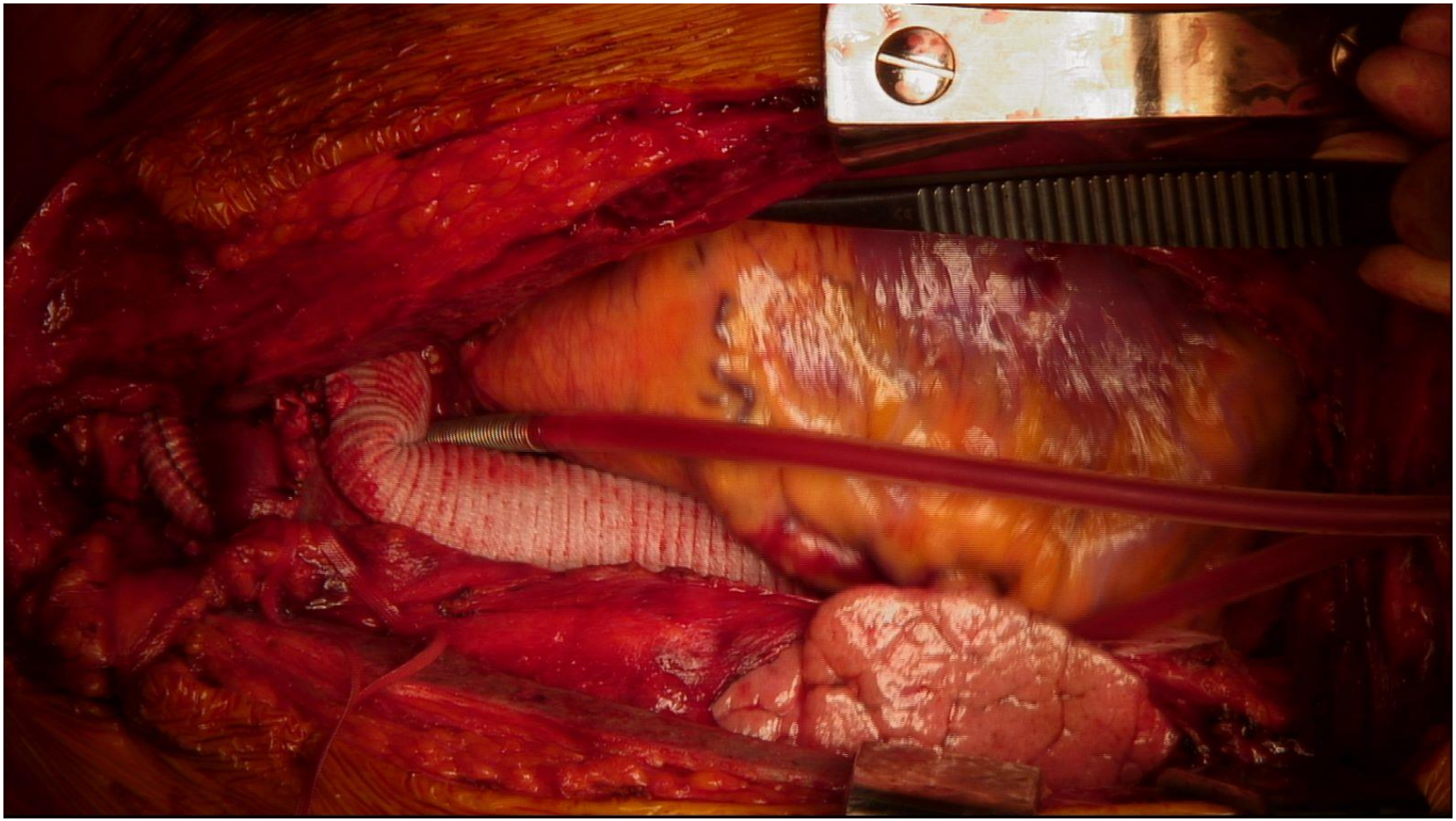


Op. photo

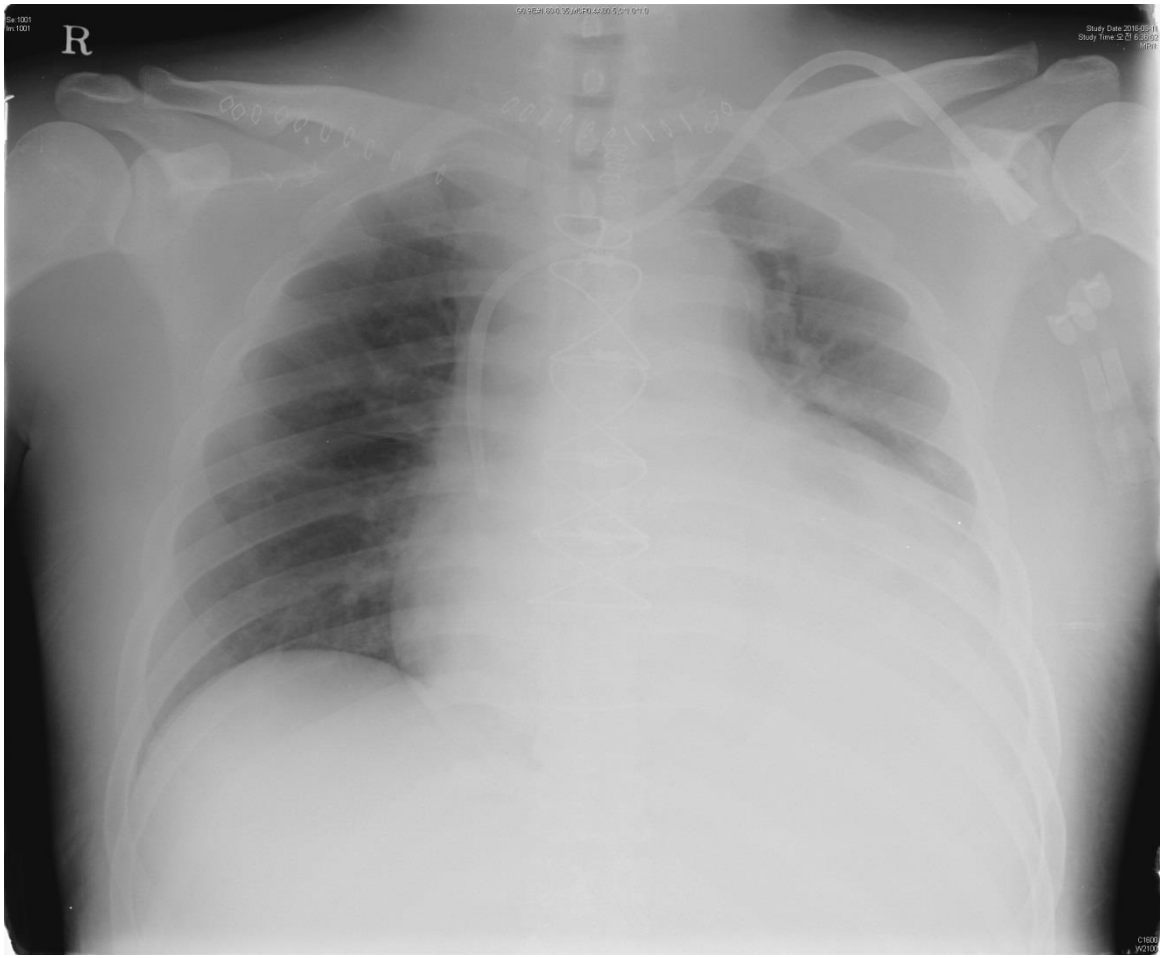


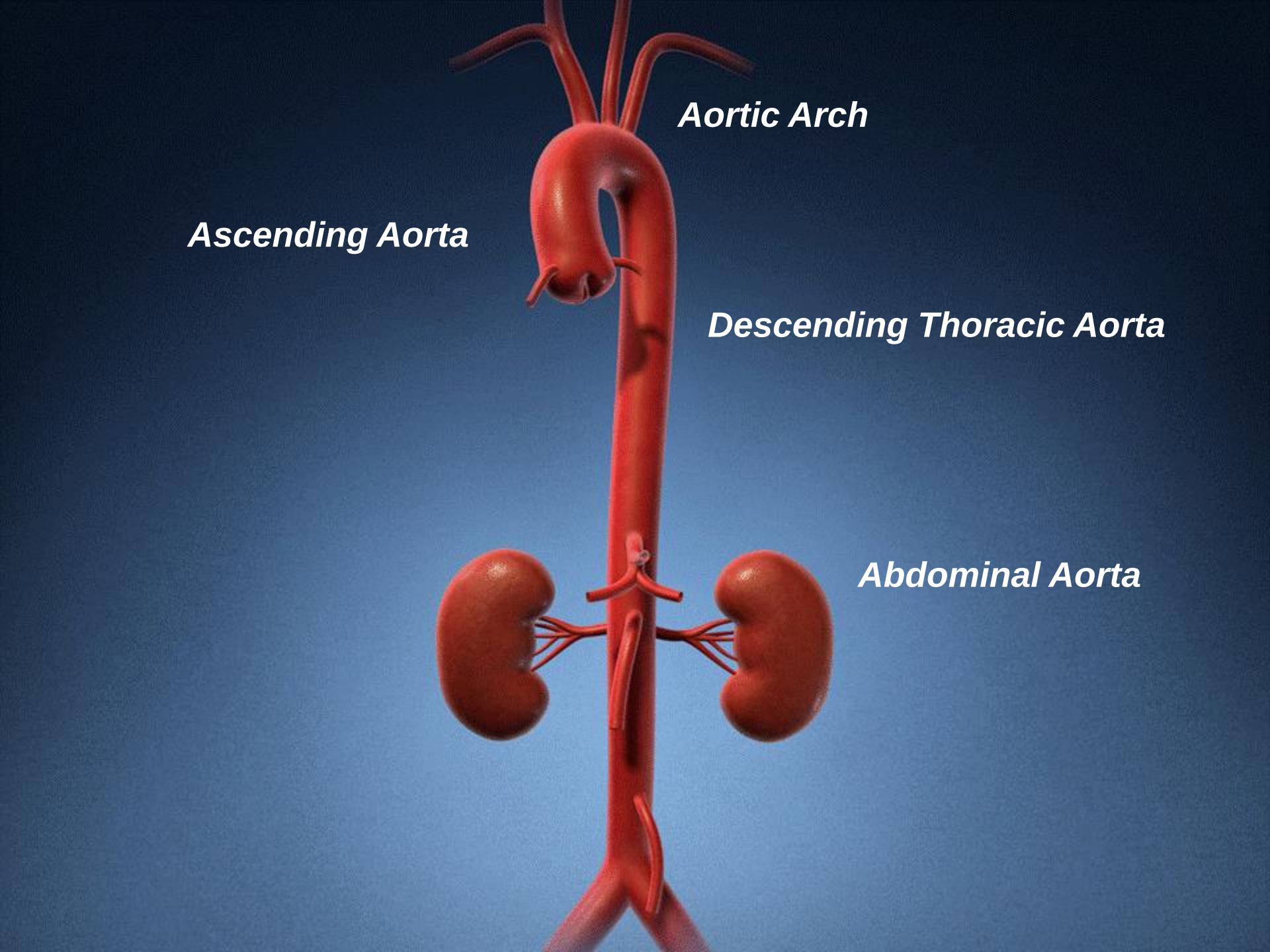


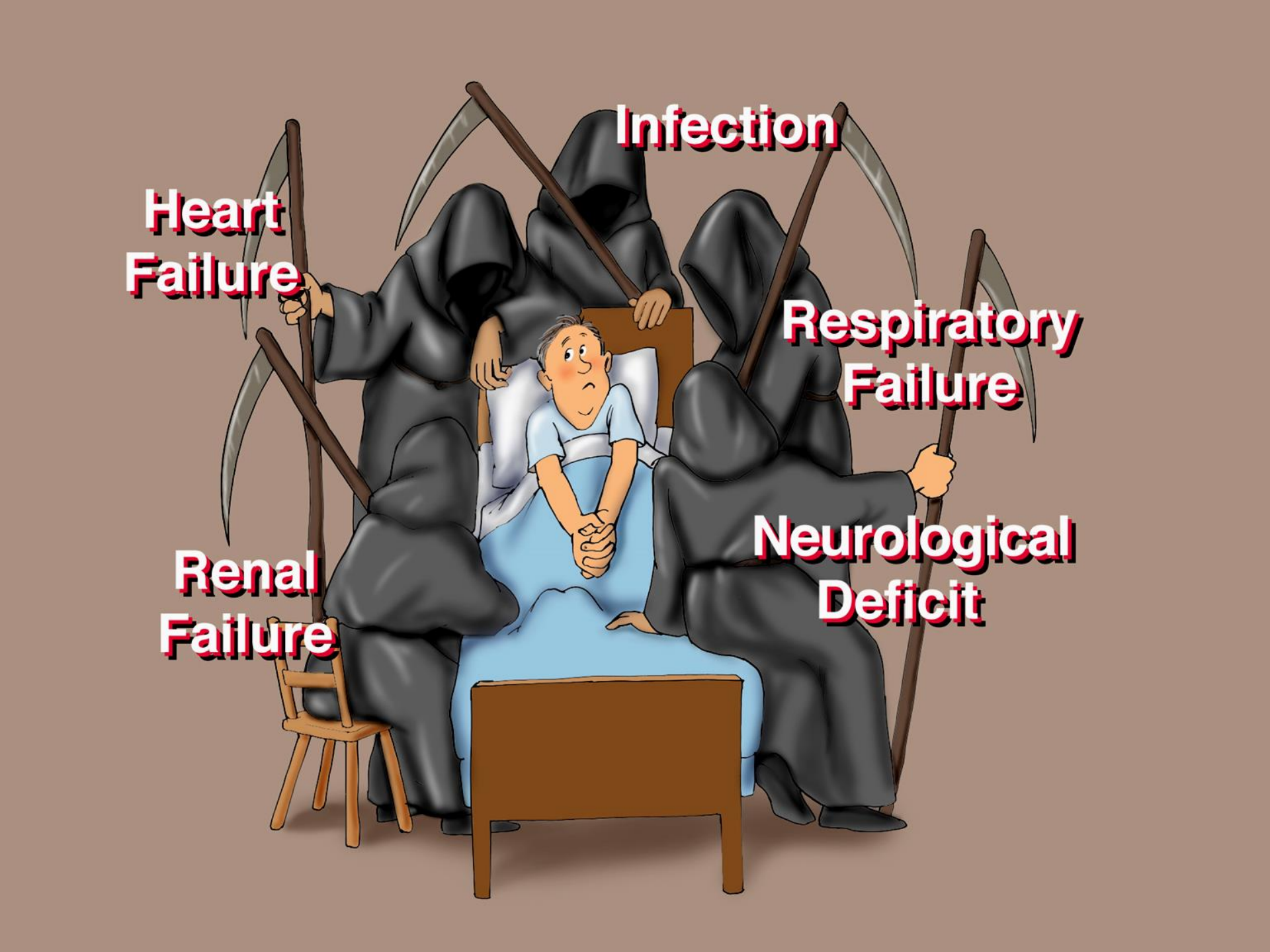
Total arch replacement



POD #13




Aortic Arch
Ascending Aorta
Descending Thoracic Aorta
Abdominal Aorta


Infection
Heart Failure
Respiratory Failure
Neurological Deficit
Renal Failure

Acute Aortic Dissection

Effects of partial thrombosis on distal aorta after repair of acute DeBakey type I aortic dissection

Suk-Won Song, MD, PhD,[a] Byung-Chul Chang, MD, PhD,[b] Bum-Koo Cho, MD, PhD,[b] Gijong Yi, MD,[a] Young-Nam Youn, MD,[b] Sak Lee, MD,[b] and Kyung-Jong Yoo, MD, PhD[b]

Objective: Prognostic implications of partial thrombosis of the residual aorta after repair of acute DeBakey type I aortic dissection have not been elucidated. We sought to analyze the impact of partial thrombosis on segmental growth rates, distal aortic reprocedures, and long-term survival.

Methods: A total of 118 consecutive patients (55% were male; mean age, 60 years) with acute DeBakey type I aortic dissection underwent surgical repair (1997–2007). The hospital mortality rate was 17.8%. Survivors underwent serial computed tomography scans. Segment-specific average rates of enlargement were analyzed. Distal reprocedures and patient survival were examined.

Results: Sixty-six patients had imaging data sufficient for growth rate calculations. The median diameters within 2 weeks after repair were as follows: aortic arch, 3.5 cm; descending aorta, 3.6 cm; and abdominal aorta, 2.4 cm. Subsequent growth rates were artic arch, 0.34 mm/y, descending aorta, 0.51 mm/y, and abdominal aorta, 0.35 mm/y. Partial thrombosis of the residual aorta predicted greater growth in the distal aorta ($P = .005$). There were 13 distal aortic reprocedures (5 reoperations, 8 stent graft insertions) for 10 years, and reprocedure-free survival was 66%. Partial thrombosis ($P = .002$) predicted greater risk of aorta-related reprocedures. Cox analysis revealed that estimated glomerular filtration rate less than 60 mL/min/1.73 m^2 ($P = .030$), reintubation ($P = .002$), and partial thrombosis ($P = .023$) were independent predictors for poor survival.

Conclusion: Partial thrombosis of the false lumen after repair of acute DeBakey type I aortic dissection, compared with complete patency or complete thrombosis, is a significant independent predictor of aortic enlargement, aorta-related reprocedures, and poor long-term survival. (J Thorac Cardiovasc Surg 2010; ■:1-7)

Supplemental material is available online.

Acute DeBakey type I aortic dissection (AIAD) remains one of the most challenging conditions for cardiovascular surgeons. Although operative outcomes for acute aortic dissection have continued to improve,[1-3] the latest report from the International Registry of Acute Aortic Dissection Investigators disclosed a high in-hospital mortality (23.9%).[4]

The most important goal of the initial AIAD surgery is thought to be immediate survival. Therefore, many surgeons favor a simple and less-invasive operative procedure for such patients. However, several studies showed that a more radical and extensive operation, such as total arch replacement, regardless of the location of the entry site or extent of pathologic process, did not increase operative morbidity and mortality, and might even improve long-term outcome by decreasing the incidence of residual patent false lumen.[2,5-7]

Residual patent false lumen has recently been reported as a potential risk factor for distal aortic enlargement and poor long-term outcomes.[8-10] However, the effect of partial thrombosis of the false lumen after AIAD repair on long-term outcomes has not been elucidated. Tsai and colleagues[11] recently showed that partial thrombosis in patients with acute type B aortic dissection predicts poor survival. We hypothesized that the postoperative status of distal false lumens would be identical to that of acute type B aortic dissection.

The present study assessed the influence of partial thrombosis on late aortic growth rate, distal aortic reprocedures, and late survival to evaluate the long-term outcomes after surgery for AIAD.

PATIENTS AND METHODS

Patients

Between January 1997 and June 2007, 118 consecutive patients (55% were male; mean age, 60 years) with AIAD underwent surgical treatment at Severance Hospital, Yonsei University Health System, Korea.

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Disclosures: None.

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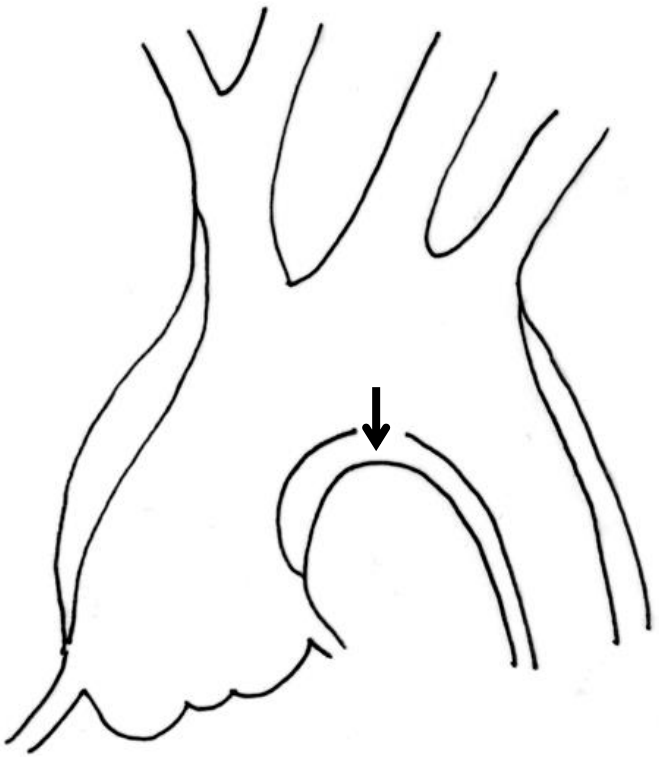
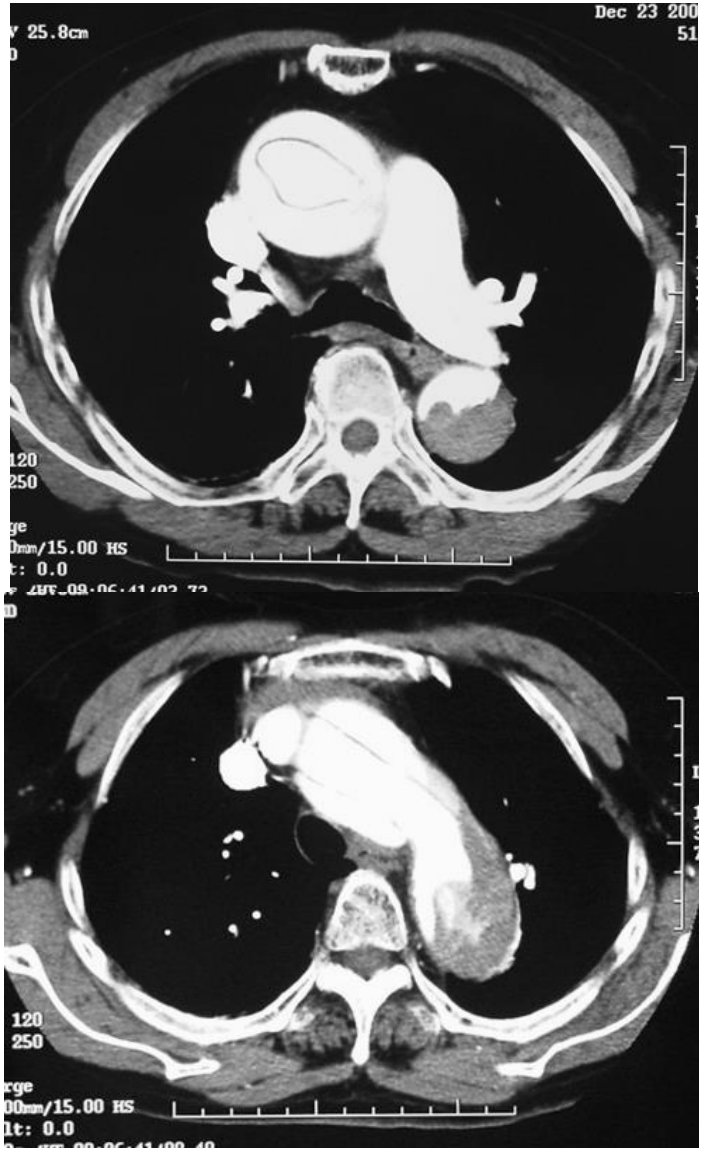
0022-5223/$36.00

doi:10.1016/j.jtcvs.2009.12.007

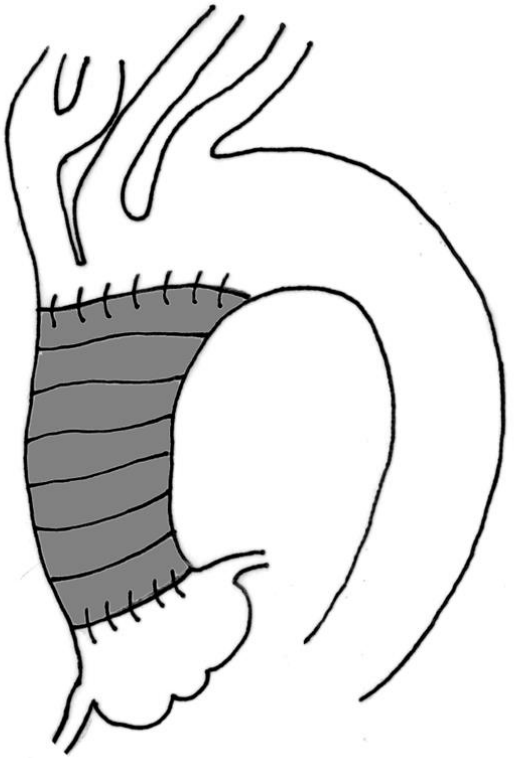
ACD

- 1997- 2007
- N = 118
- Hospital Mortality 17.8%



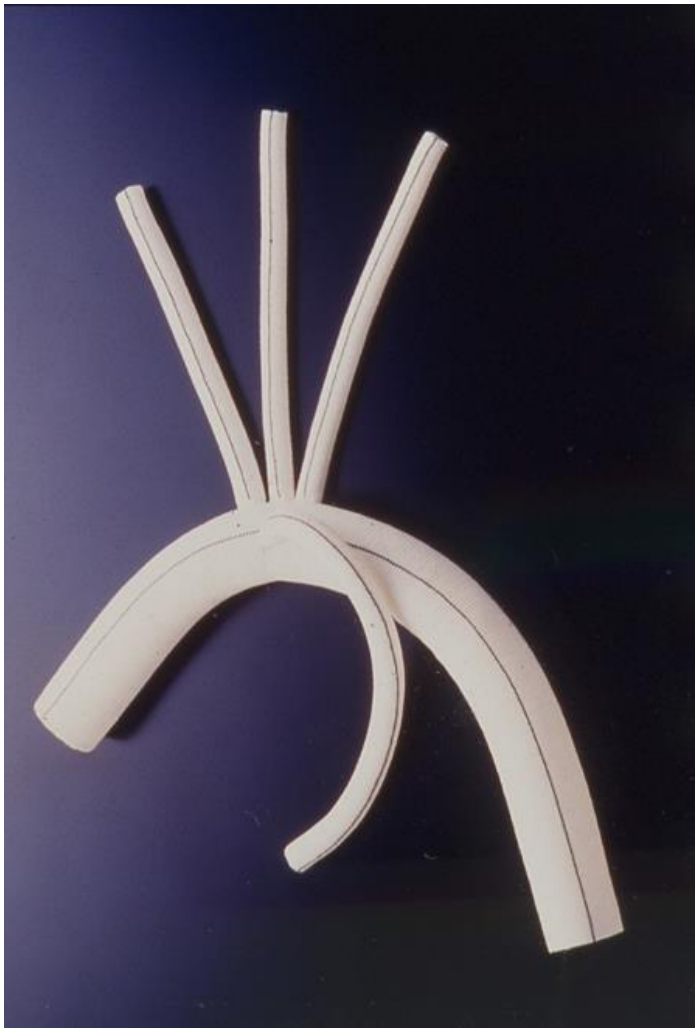


89 y/o Female, acute type-A dissection



Hemiarch Replacement

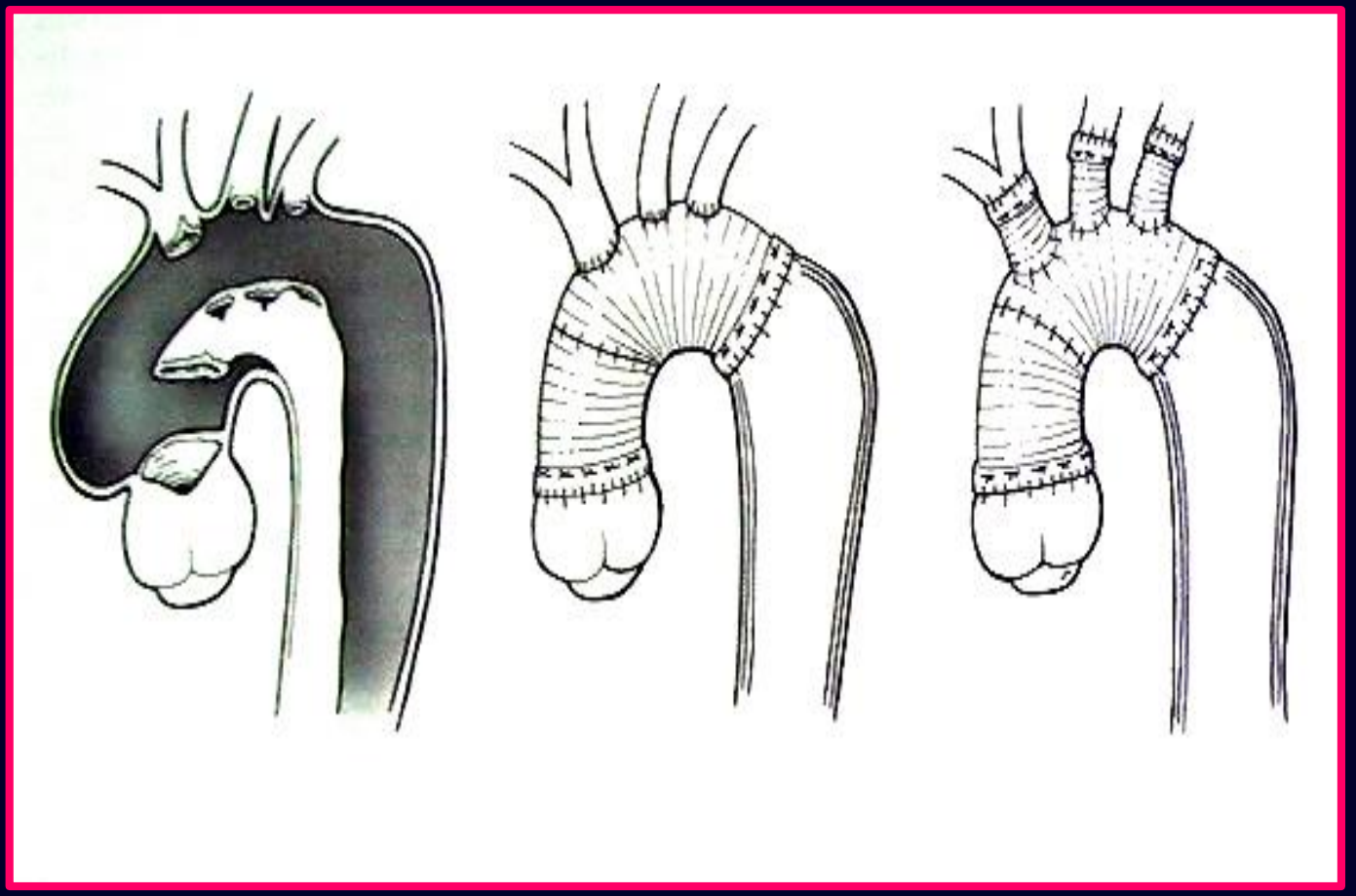
Commercially Available Four-Branched Aortic Arch Graft

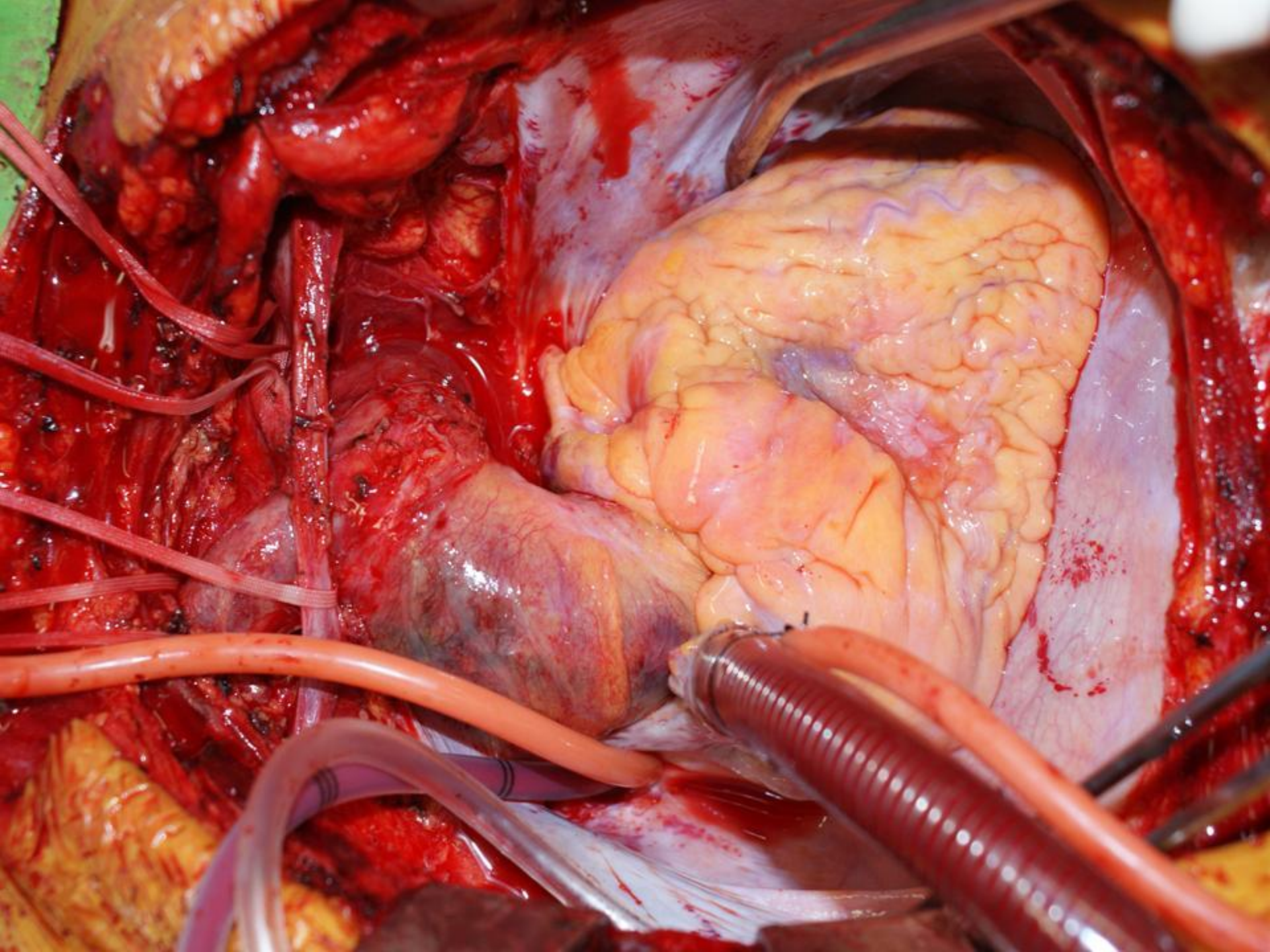


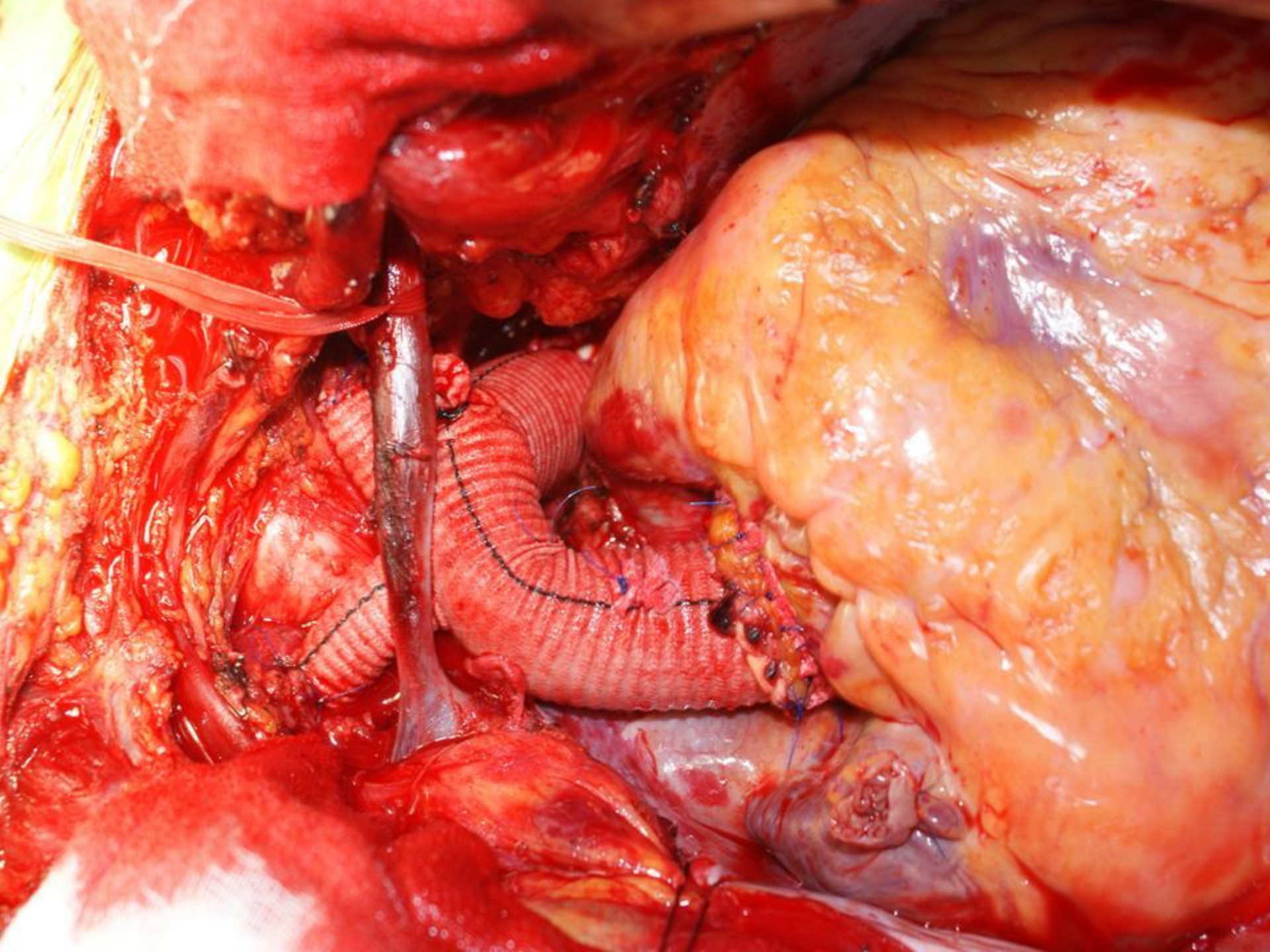
Hemashield Branched Graft
(Boston Scientific, Wayne, NJ

InterGard Aortic Arch
(Intervascular, La Ciotat, Cedex,France)

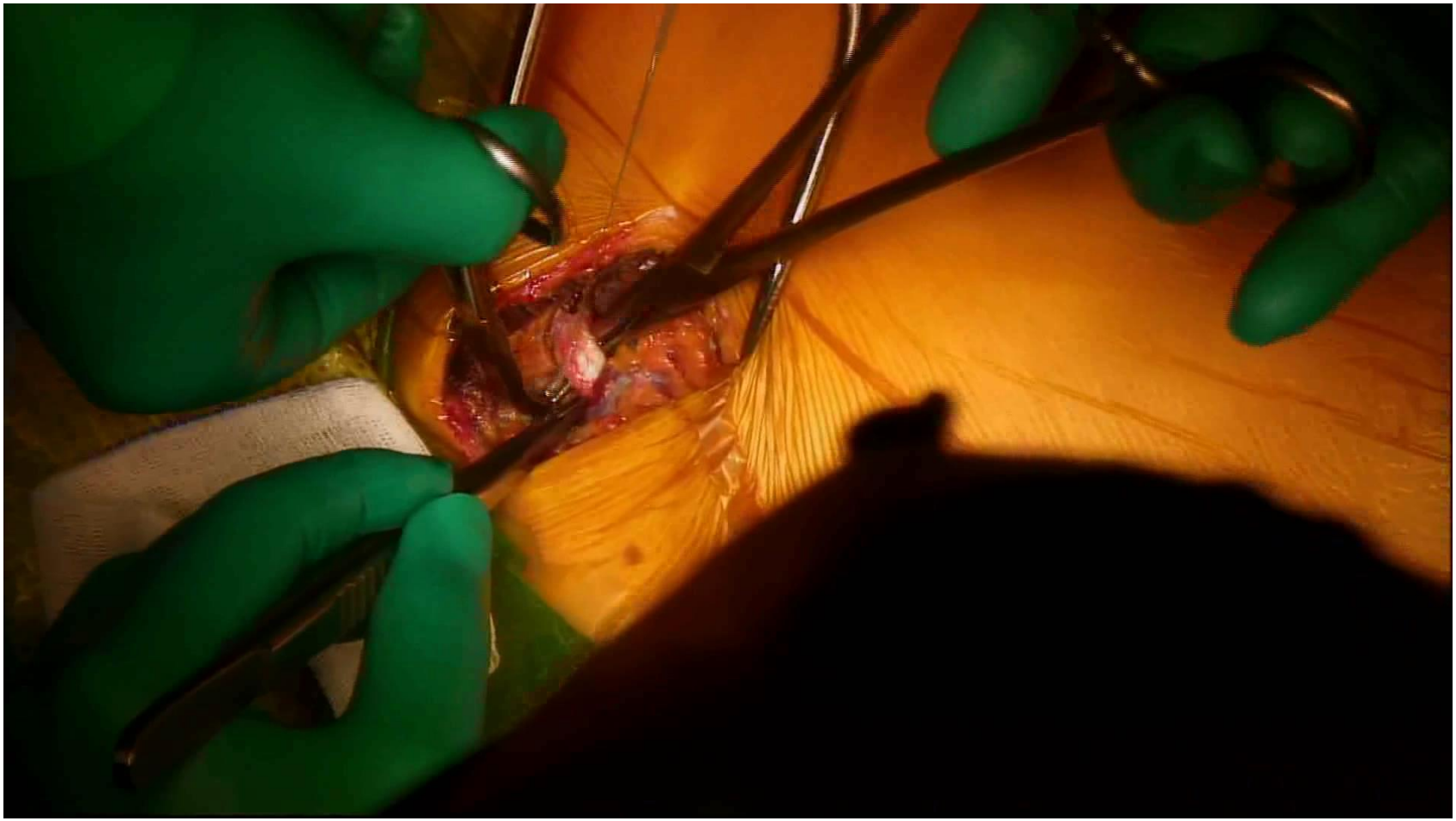
OPERATION





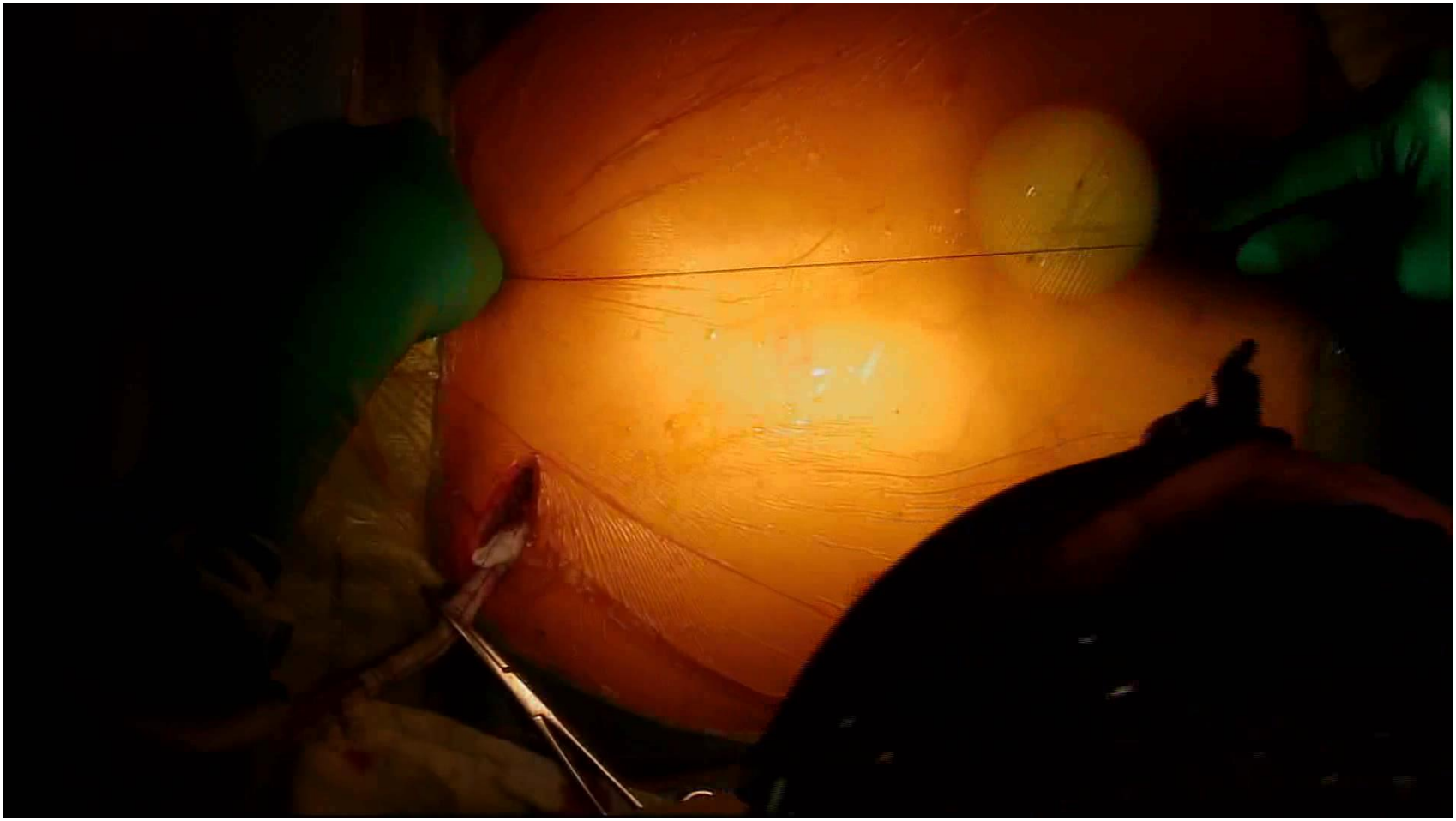


Right axillary artery cannulation



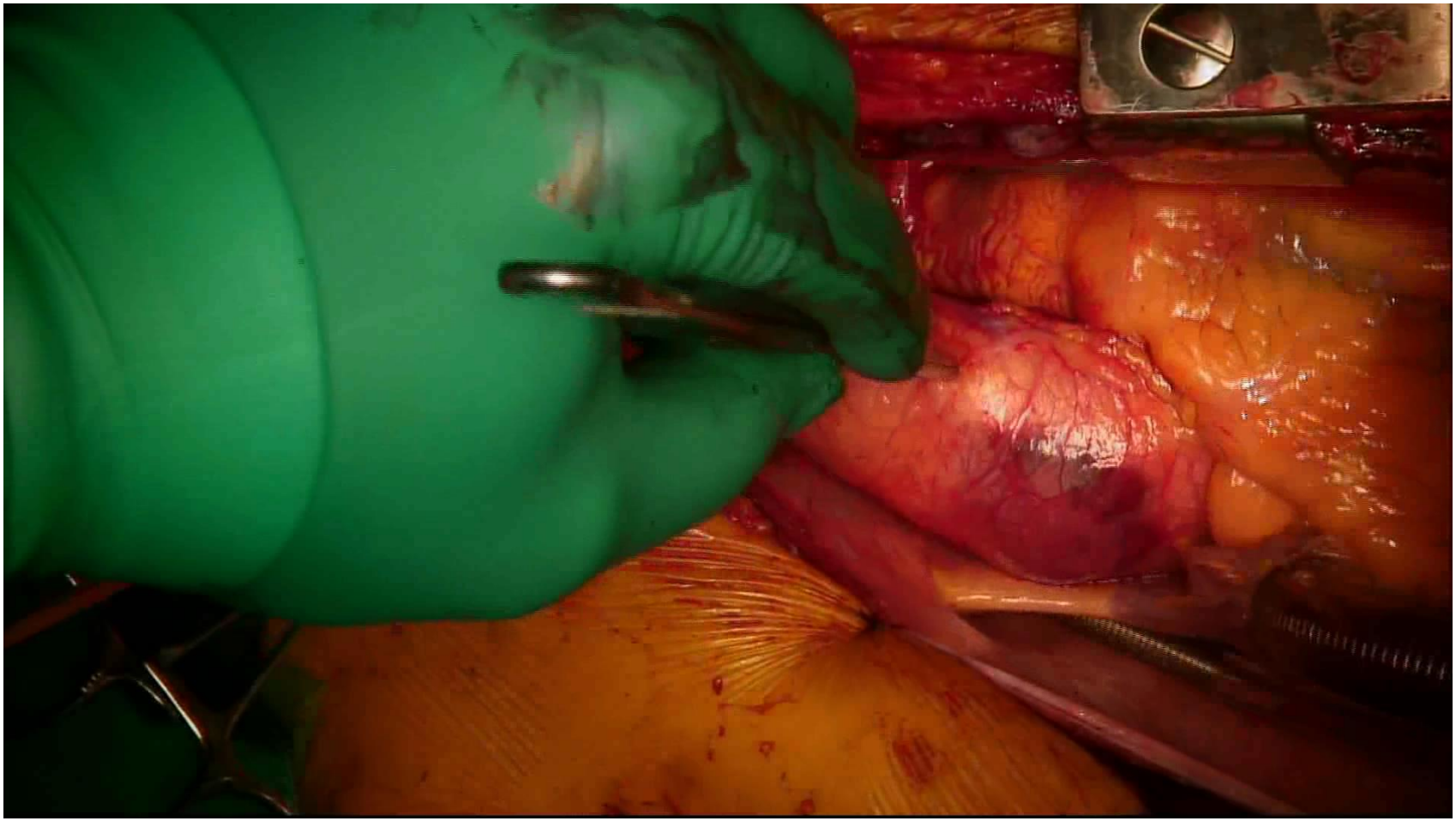
Femoral artery cannulation

Sternotomy

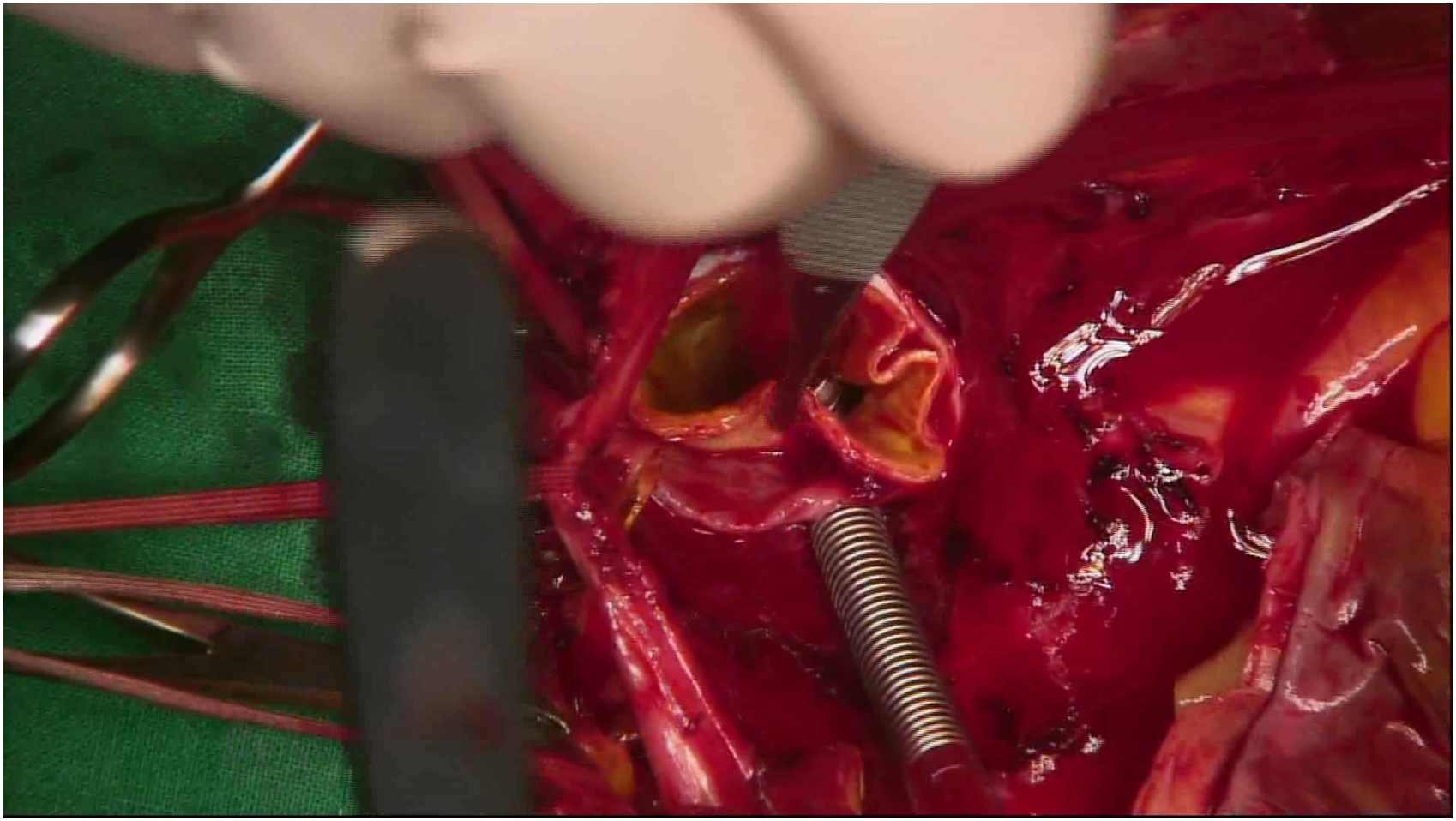


RA cannulation

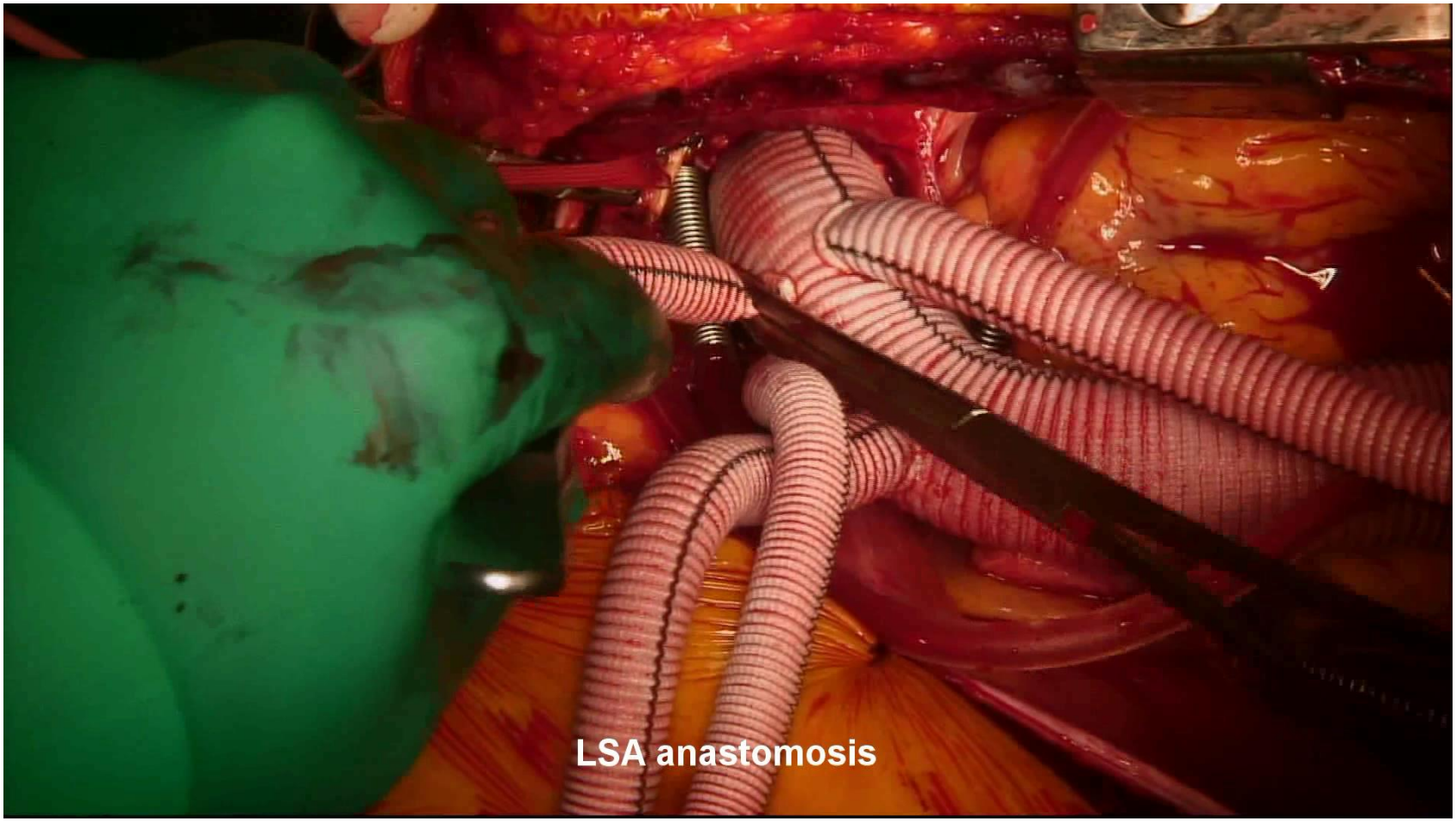
Arch resection



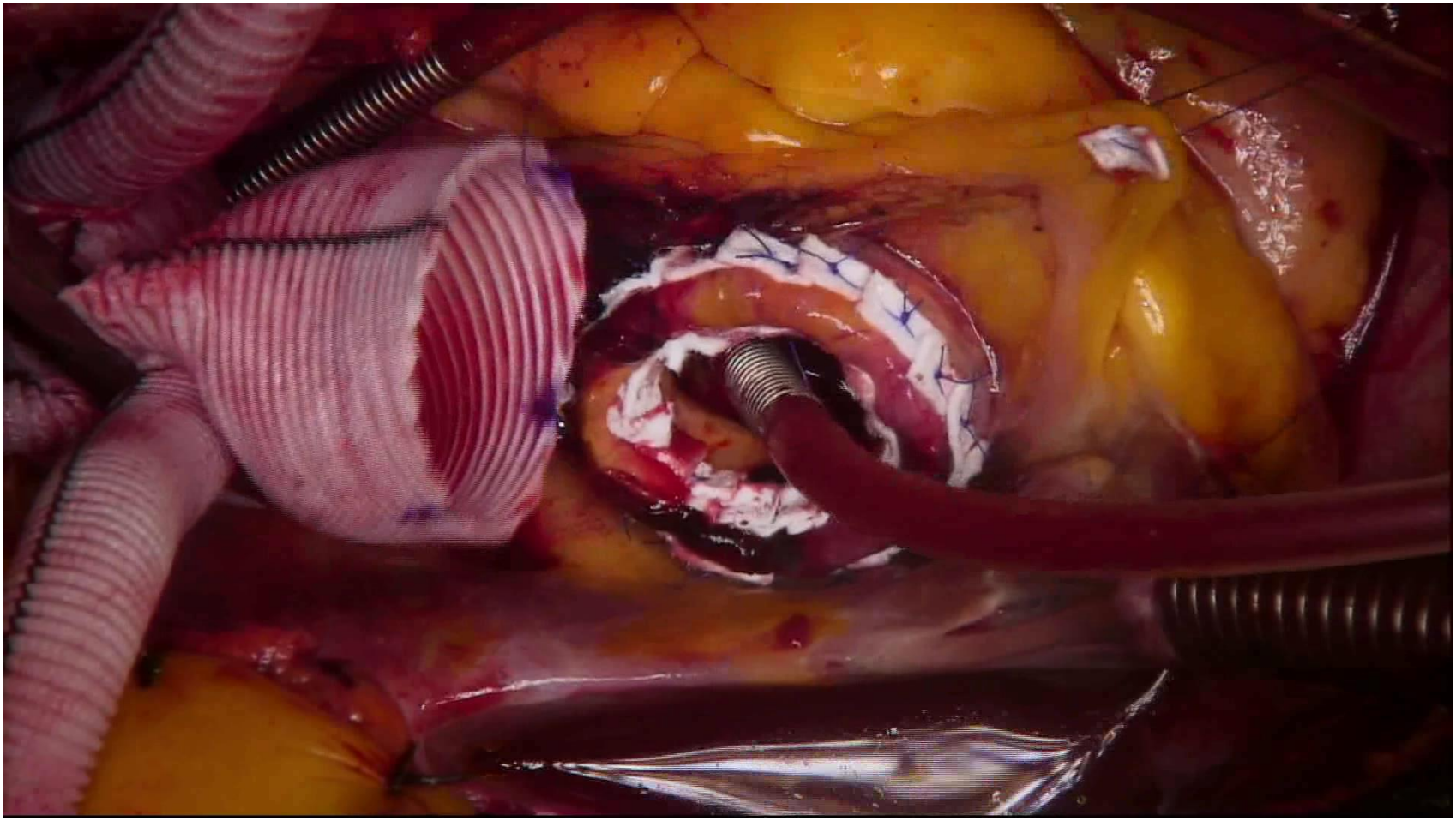
Distal anastomosis



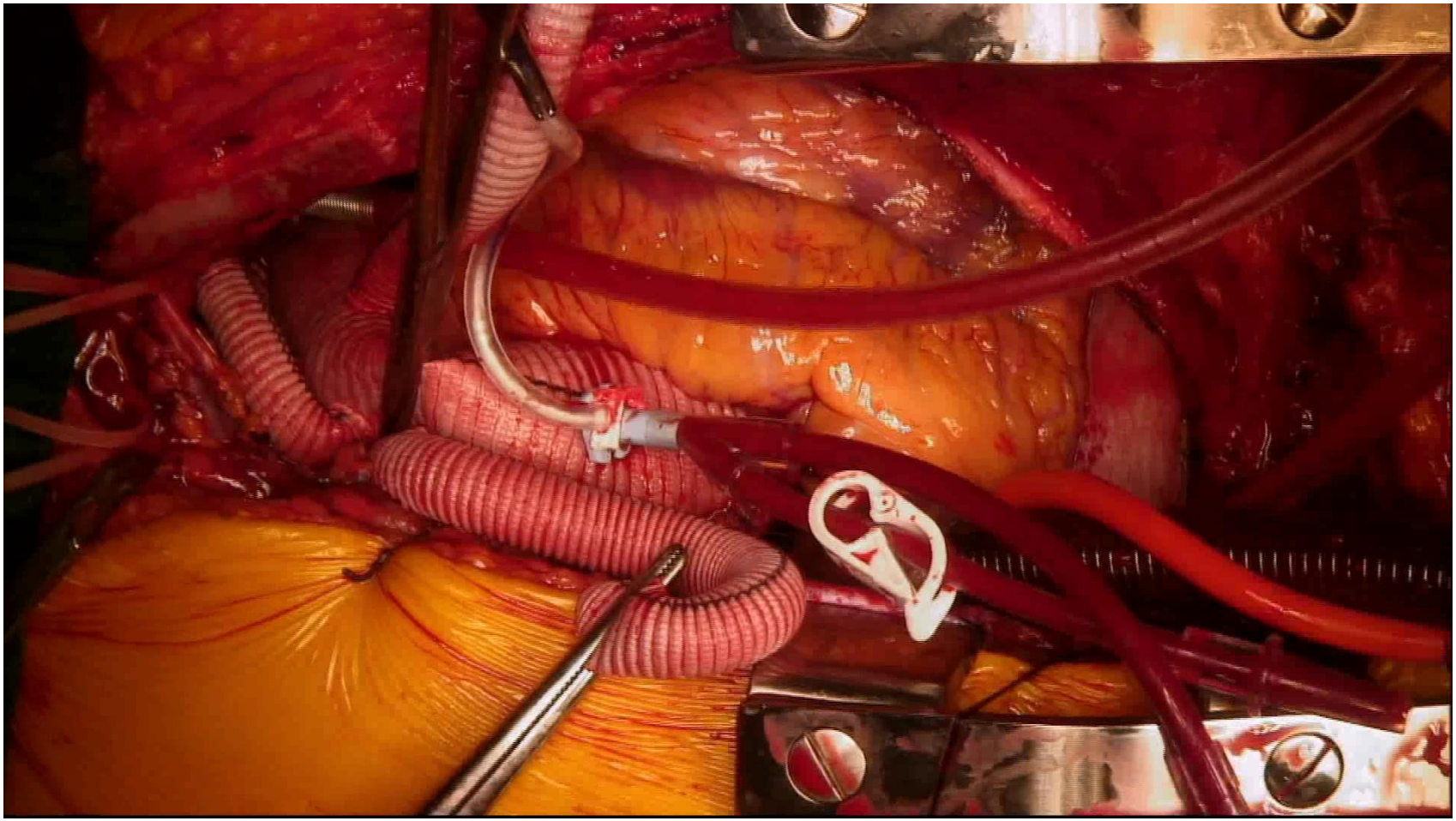
Head vessel anastomosis



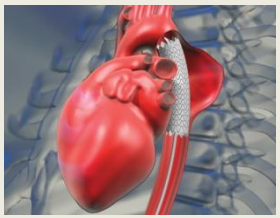
Proximal anastomosis



Return of heart beat



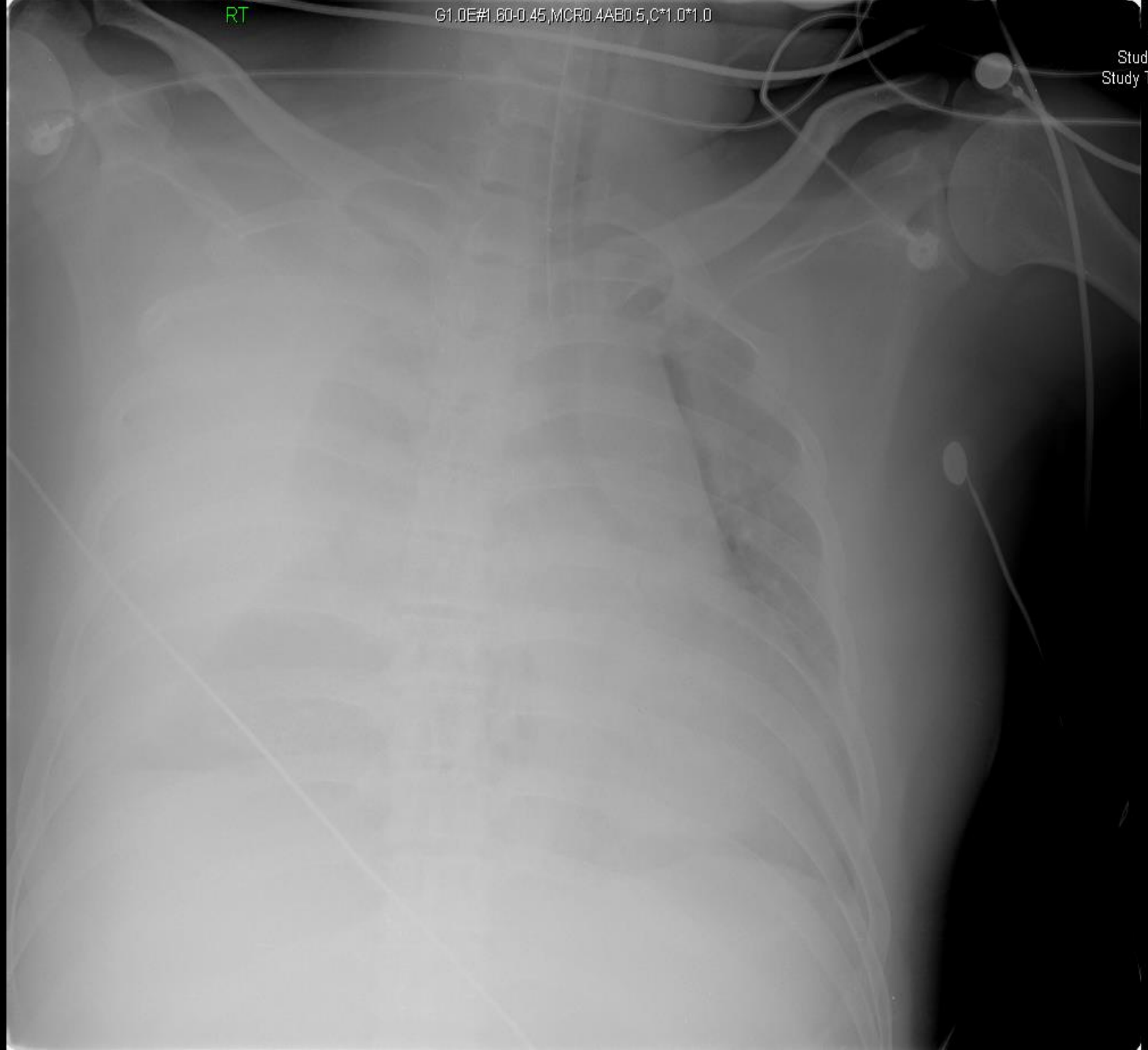
Acute Type B Aortic Dissection

	AD	IMH
Type A	**Surgery** Extent of surgery Cerebral perfusion modality Site of cannulation	**Surgery** - Early - Delayed **Medical Tx.**
Type B	**Medical Tx.** (Stent graft) **Surgery** 	**Medical Tx.** 

Indication of Surgery in type B AD

- Limited to the prevention or relief of life threatening complications
  - Such as intractable pain, expanding aortic D., periaortic or mediastinal hematoma as signs of aortic rupture
  - No proven superiority of one particular Tx. among surgical, stent grafting or medical Tx.

- General indication for surgery in type B AD
  - Persistent, recurrent chest pain
  - Aortic expansion
  - Periaortic hematoma
  - Mediastinal hematoma


RT
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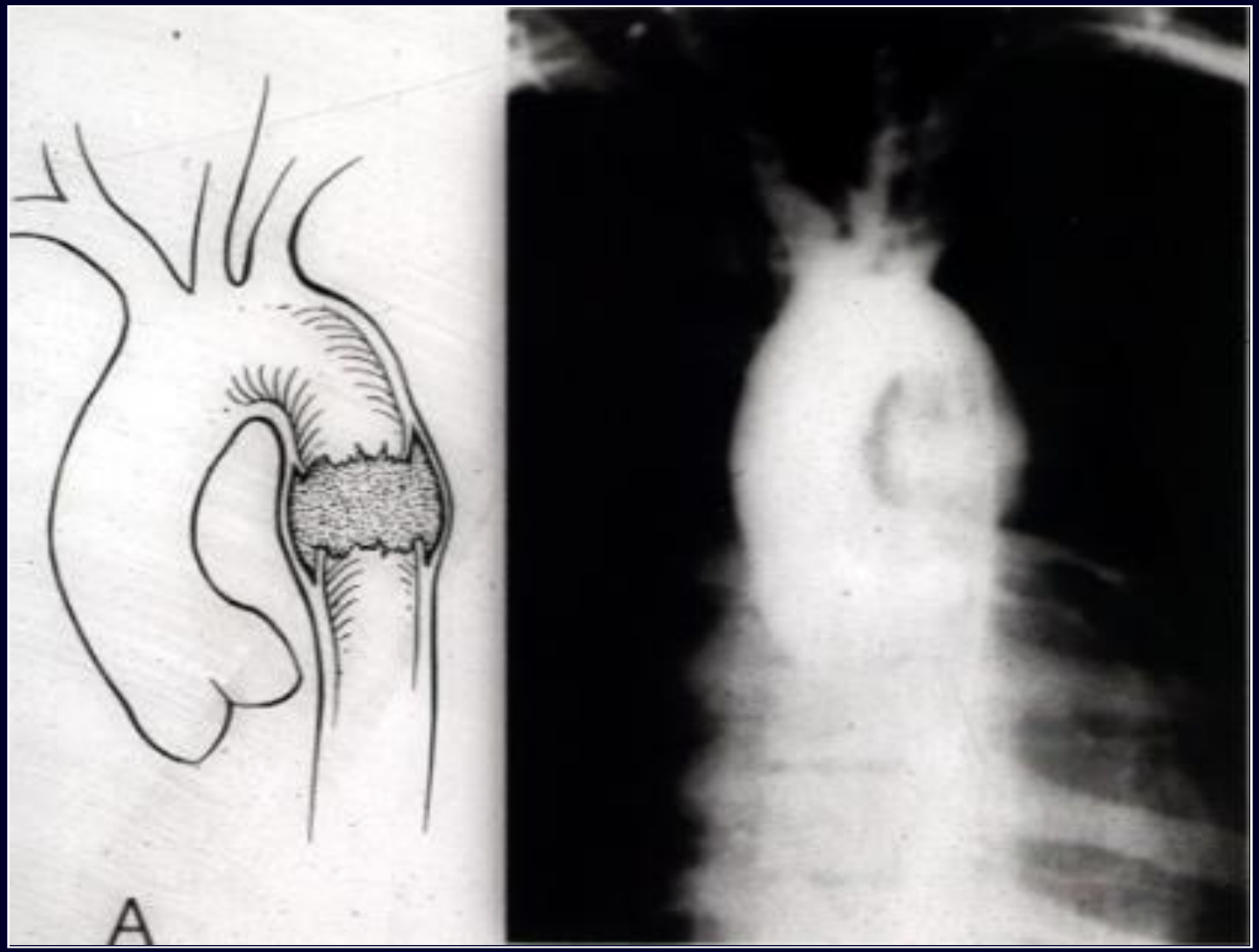
Se:1001
Im:1001
KIM BYUNG HUN
Study Date:2009-10-25
Study Time:오전 8:51:31
MRN:6346265
C1375
W1801

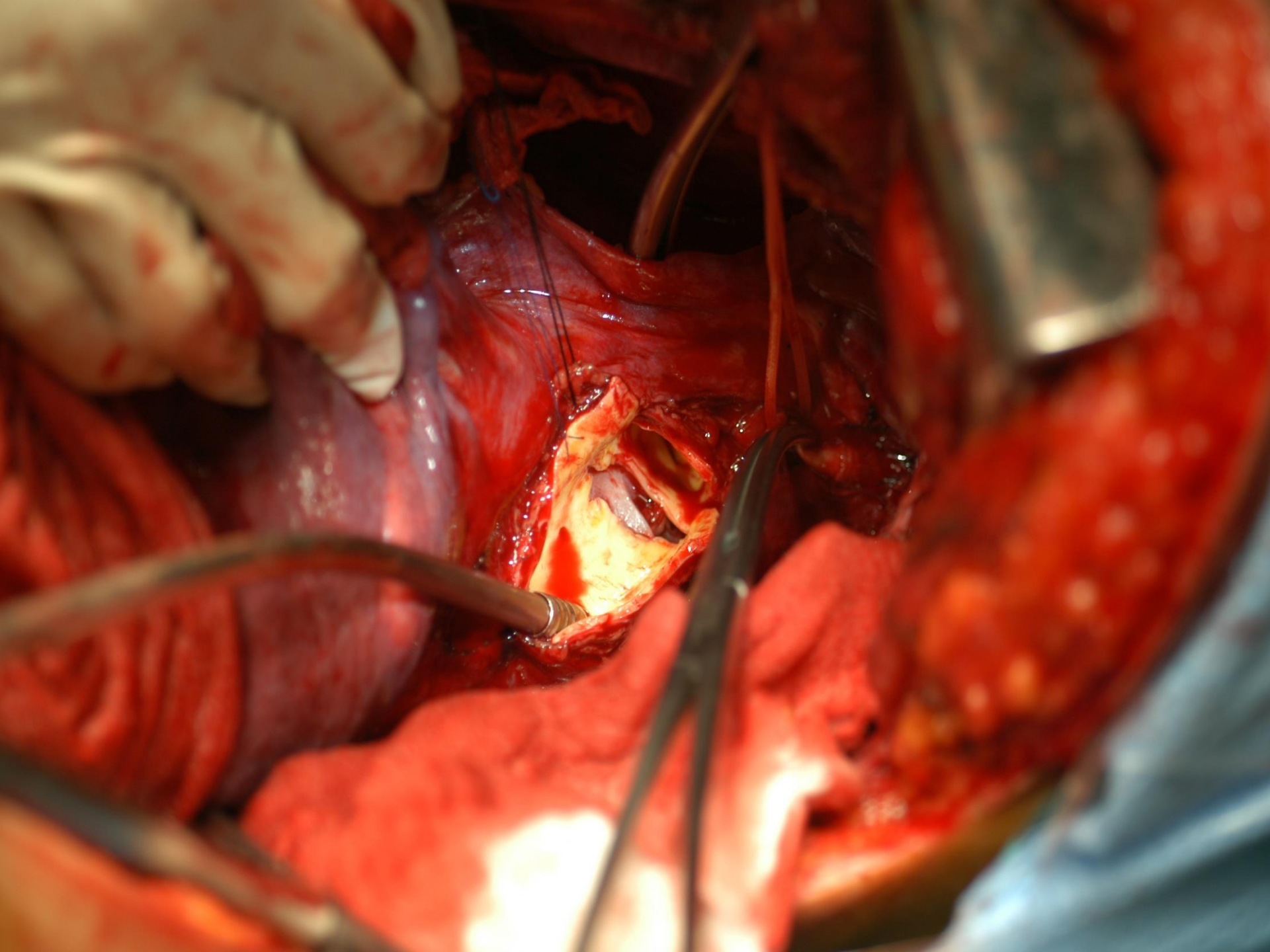
Suggestions

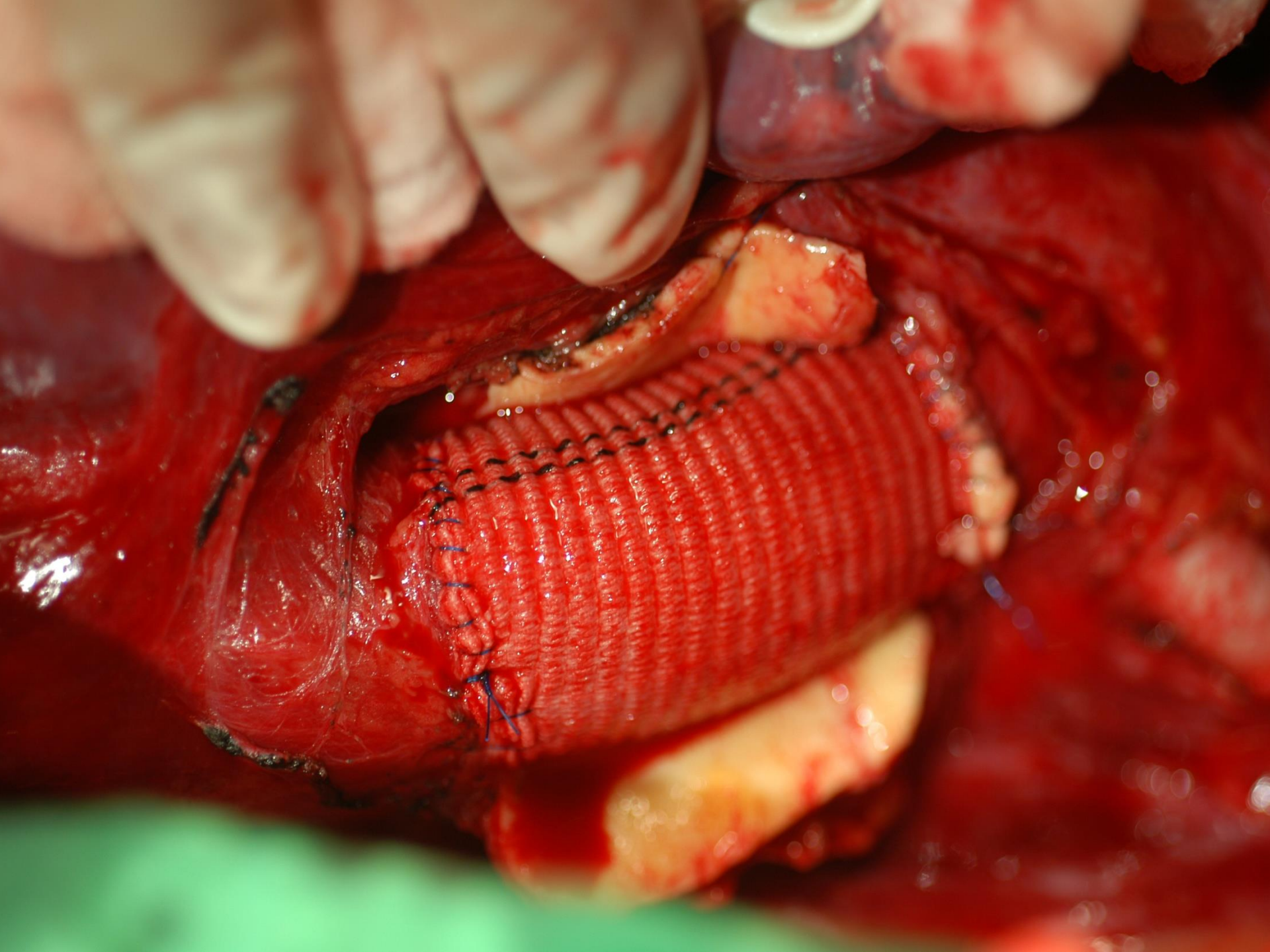
- Regarding the severity of complications and, broad indication for surgery in type III aortic dissection can be proposed

  - Persistent, recurrent chest pain
  - Aortic expansion
  - Periaortic hematoma
  - Mediastinal hematoma
  - **Aortic Arch involvement**
  - **Proximal DTA diameter > 40mm in Younger patient**

Traumatic Aortic Dissection







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ORIGINAL ARTICLE

Effects of intermittent lower body perfusion on end-organ function during repair of acute DeBakey type I aortic dissection under moderate hypothermic circulatory arrest††

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[b] Department of Thoracic and Cardiovascular Surgery, Yonsei Cardiovascular Hospital, Severance Hospital, Yonsei University Health System, Seoul, Republic of Korea
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Abstract

OBJECTIVES: To avoid deep hypothermia-related side effects, moderate hypothermic circulatory arrest (HCA) is commonly employed during aortic arch repair, thereby jeopardizing end-organ protection. We sought to analyse the effect of intermittent lower body perfusion (ILBP) on end-organ function during repair of acute DeBakey type I aortic dissection (AIAD).

METHODS: Between May 2008 and May 2011, 107 patients underwent surgical repair for AIAD. All operations were performed with selective cerebral perfusion (SCP) under either moderate HCA only ($n = 57$) or moderate HCA with ILBP ($n = 50$). Adverse outcomes, including operative mortality, permanent neurological deficit, temporary neurological deficit, renal failure requiring dialysis and hepatic dysfunction, were compared between the two groups.

RESULTS: The mean body temperature at the initiation of SCP was 28.7 ± 1.9°C. Overall operative mortality occurred in 6 (5.6%) patients. The incidences of permanent neurological deficit and temporary neurological deficit were 1.9 and 4.7%, respectively. None of the 9 (8.4%) patients who suffered postoperative renal failure requiring dialysis received ILBP. The laboratory data showed significantly lower levels of hepatic and kidney enzymes in the ILBP group ($P < 0.05$).

CONCLUSIONS: Significantly lower levels of hepatic and kidney enzymes indicate more effective end-organ protection with the use of ILBP. Our data suggest that ILBP provides more effective end-organ protection during repair of aortic arch under moderate HCA.

Keywords: Aortic dissection • Circulatory arrest

INTRODUCTION

In the era of antegrade cerebral perfusion (ACP) during the surgical repair of the aortic arch, deep hypothermia is no longer essential for brain protection [1–3]. Although a duration of ACP >90 min has been reported to be safe in terms of cerebral protection [4], most of the recent series reported ACP mean times between 60 and 70 min [3, 5, 6]. As a result, many surgeons try to increase body temperature from deep hypothermia to mild, moderate hypothermia during open distal anastomosis. However, little is known about the safety margin of lower body organs at various body temperatures. We only know that, in general, safety margins are narrower with the spinal cord than the kidney, liver and pancreas, etc. [1–3]. The Hannover group was the first to report on the dangers of prolonged lower body circulatory arrest with only moderate hypothermia: a mortality rate of 27%, postoperative use of a dialysis rate of 18% and paraplegia rate of 18% in patients with lower body circulatory arrest for >60 min at 28°C [7]. In 2009, the Mount Sainai group showed their experimental data that the ischaemia tolerance of the spinal cord may be exceeded enough by 90 min to impair function; by 120 min, ACP at 28°C invariably results in paraplegia [8].

Morbidity related to the postoperative malfunction of other organs, in particular renal, hepatic and respiratory failure, along with bleeding, remains an important issue in aortic surgery [9, 10]. ACP allows the avoidance of deep hypothermia, which should be beneficial for end-organs, and reduce deep hypothermia-related side effects [9]. However, particularly during complex distal procedures, the risk of non-neurological complications can be exacerbated, as end-organs can suffer from 60 to 70 min of 'warm' circulatory arrest [11, 12]. Some surgeons suggest that adding concomitant perfusion of the thoracoabdominal aorta could help protect end-organs during circulatory arrest by occluding the

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††Presented at the 43rd Annual Meeting of the Korean Association for Thoracic and Cardiovascular Surgery, Kwangju, Korea, 2011

2008-2011

N = 107

Hospital Mortality 5.6%

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