

BACKGROUND Minimally invasive coronary bypass surgery in its different variations is a popular operation with excellent outcomes [1]. However, most of the groups use venous grafts for non-LAD territories. In this study, we demonstrate how left and right internal thoracic arteries (ITA) may be configured in order to achieve full arterial revascularization via the left minithoracotomy.

MATERIAL AND METHODS Between January 2016 and December 2024 190 patients with stable multivessel coronary artery disease were operated via left-minitoracotomy. In these patients only ITA grafts were used. No conduits were harvested from extremities. All operations were conducted off-pump using different types of rib retractors with chest wall elevators, and myocardial stabilizers (vacuum or non-vacuum tissue stabilizers). Apical stabilizing devices were not used. ITA harvesting and Y-graft formation was accomplished under direct vision or with endoscopic assistance.

RESULTS All patients received full myocardial revascularization. In 171 patients revascularization was achieved only by ITA grafts. In 78 cases ITAs were used as in situ grafts where right ITA (RITA) revascularized LAD system and left ITA (LITA) anastomosed to the left-sided branches. In the remaining 93 cases we harvested RITA as a free graft and used it as a Y-graft with LITA. In this scheme, RITA length was usually enough to graft circumflex branches sequentially and even reach PDA. In 9 cases when RITA length was scarce we used venous or radial conduits. The overall number of the patients who underwent postoperative CT coronary evaluation is 18. Median follow-up was $22,7 \pm 11,8$ months. Among 46 investigated grafts only 2 had signs of dysfunction (competitive flow). Thus, the patency rate was 95.6 %. The length of the operations was 212 ± 61 minutes. There was no perioperative mortality in this series.

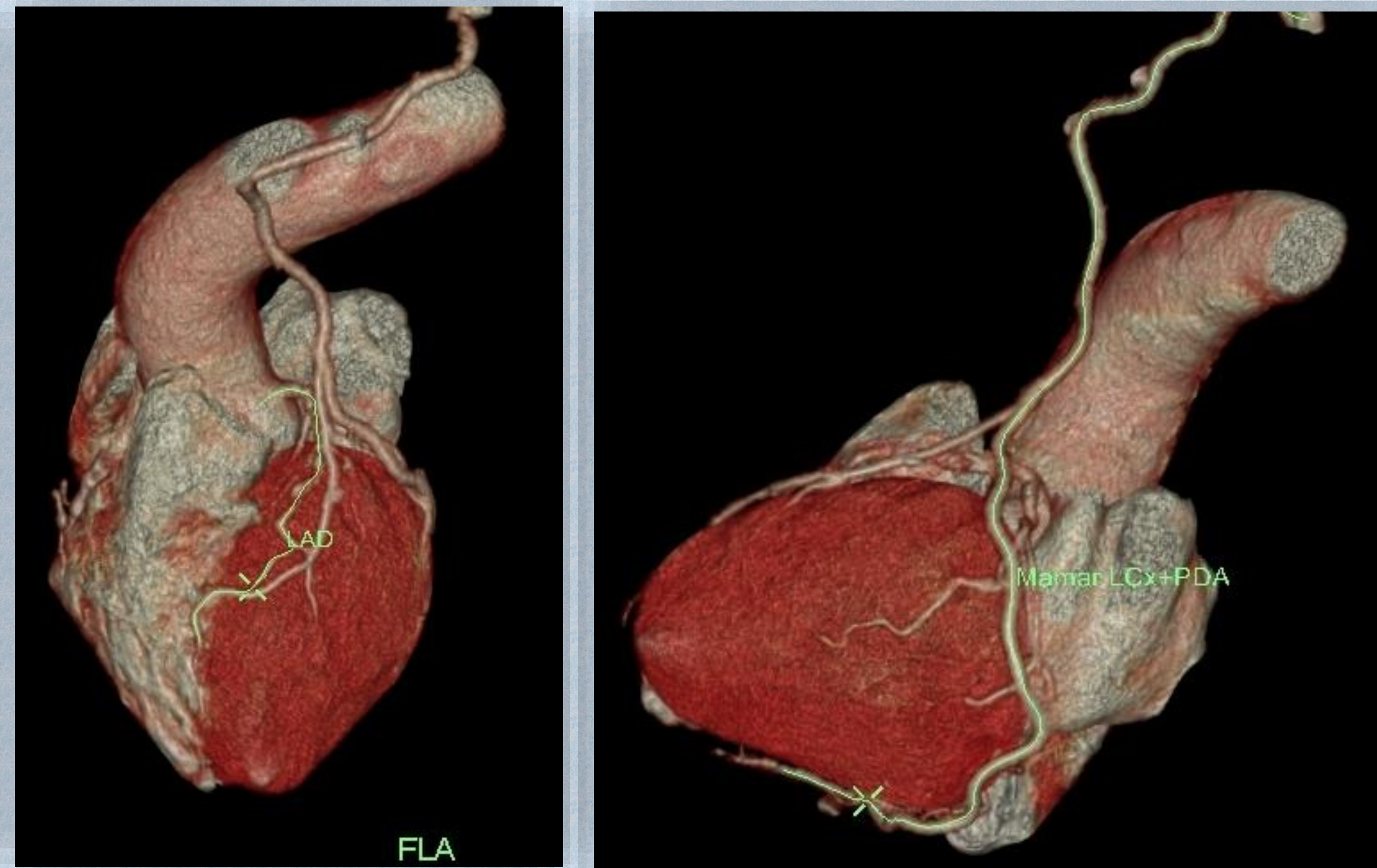


Fig. 1. **A** – MDCT-angiography, 3D-reconstruction of a Y-graft, anterior projection demonstrating the left ITA graft to LAD and DA with the native course of LAD; **B** – Course of the right ITA conduit to OM and PDA depicted

Parameter	Rate, n (%)
Conversion to sternotomy or ministernotomy, n (%)	2 (1,1)
30-day mortality, n (%)	0
MI, n (%)	2 (1,1)
Cerebrovascular events, n (%)	0
Major bleeding, n (%)	0
Prolonged ICU stay (> 4 days), n (%)	5 (2,9)
Repeat revascularization within 1st year, n (%)	4 (2,3)
Wound infection, n (%)	0
Duration of operations, min (mean $\pm$ sd)	212 $\pm$ 61

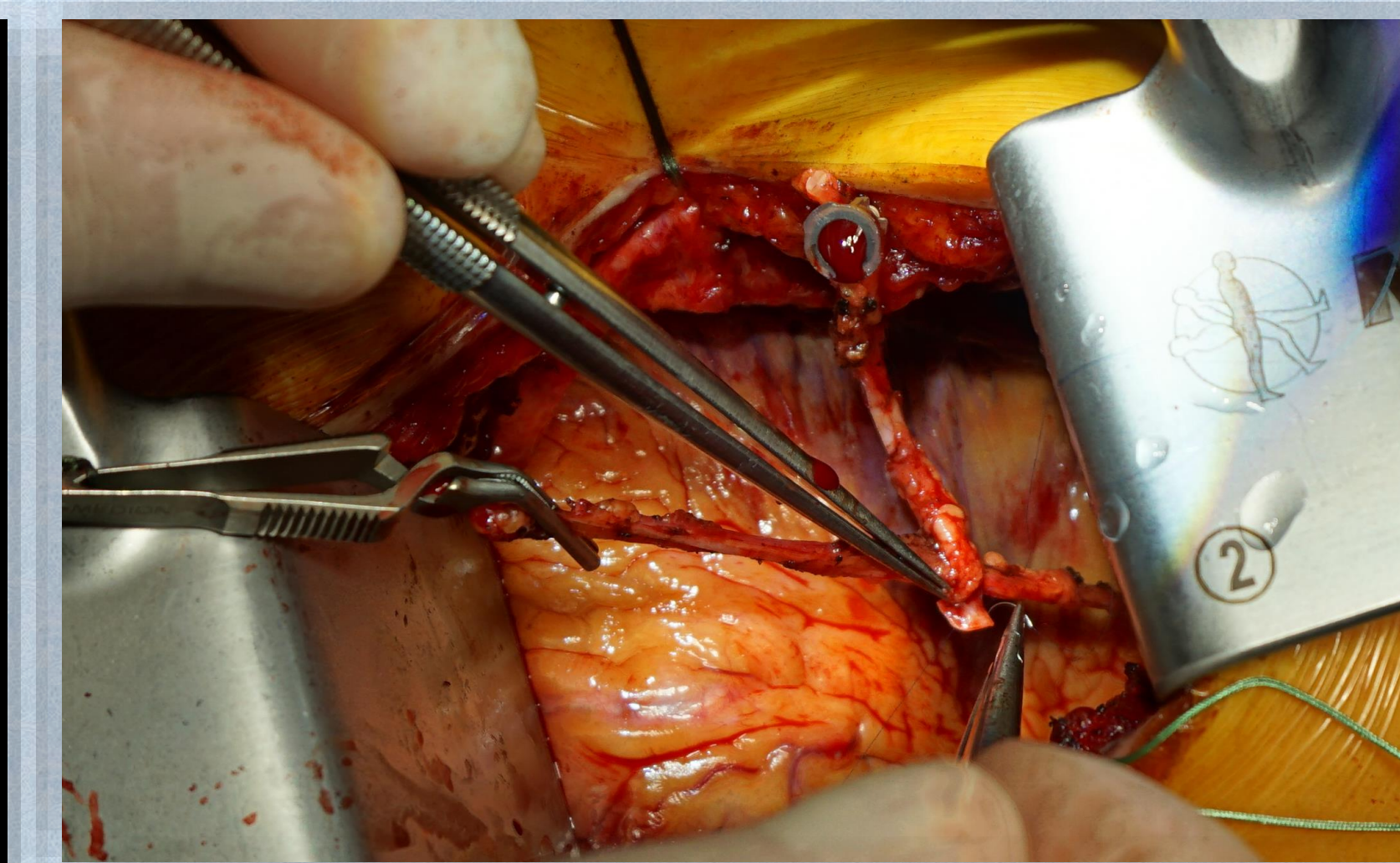


Fig. 2. Intraoperative image demonstrating "Ad-oculus" Y-anastomosis formation

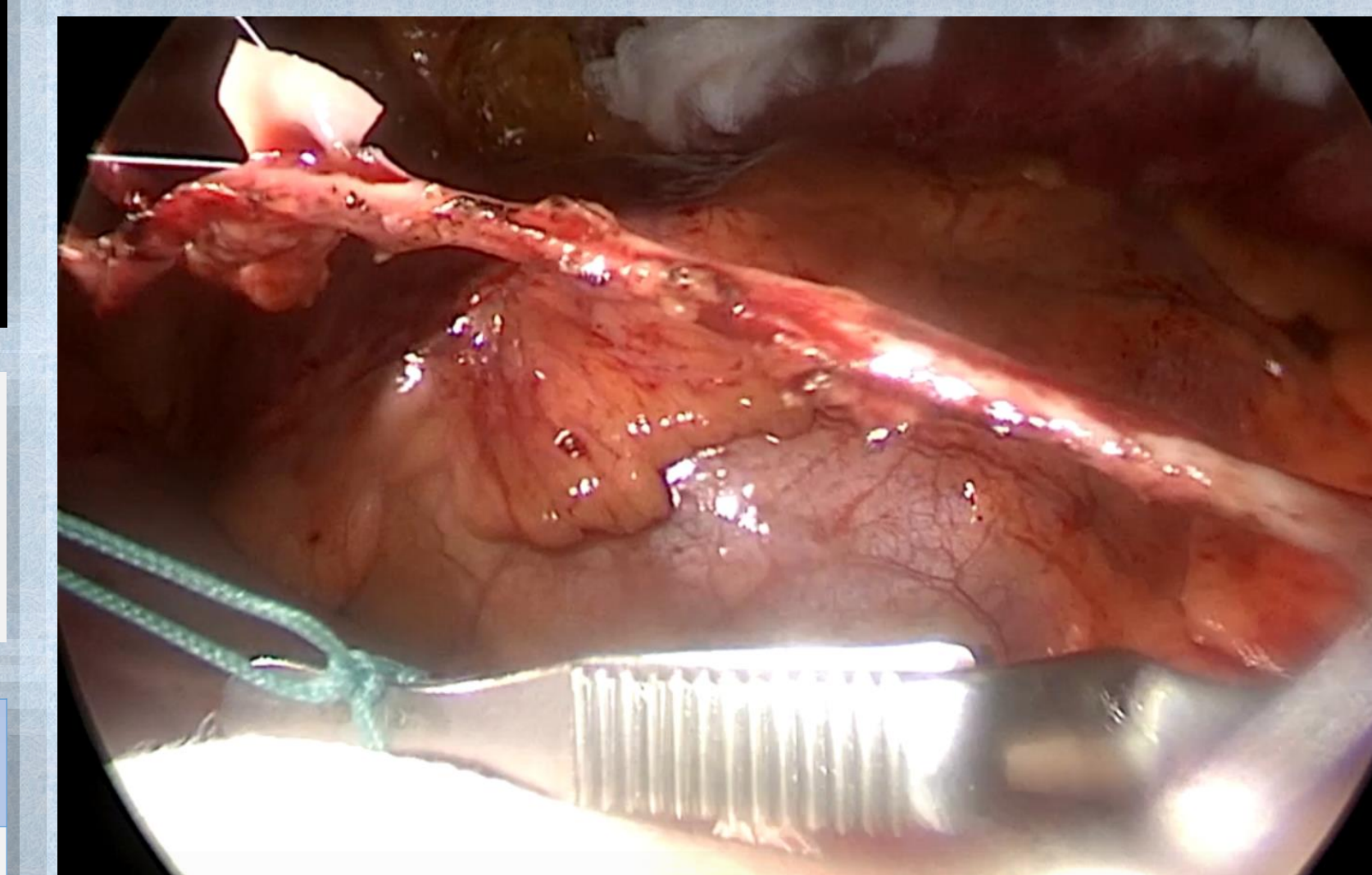


Fig. 3. Endoscopically assisted formation of Y-anastomosis between right and left internal thoracic arteries

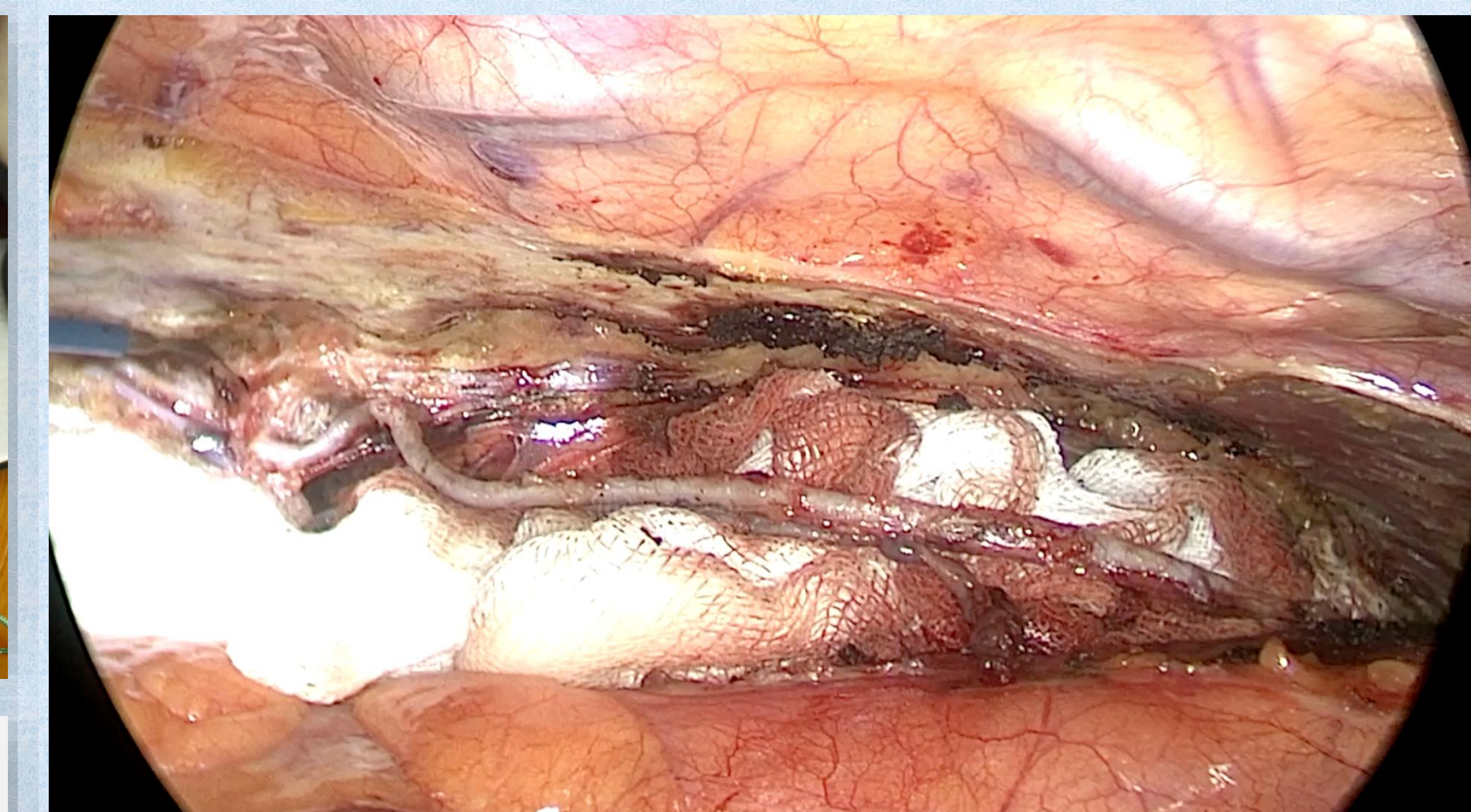


Fig. 4. Intraoperative endoscopic image demonstrating right ITA harvested with endoscopic assistance to its full length

CONCLUSION Minimally invasive multivessel bypass grafting may be safely performed via left minithoracotomy. The most useful configuration when more than 2 targets are required – is composit Y-/T-graft configuration. Endoscopic assistance may be useful for achieving better visualization

Reference: 1. Verevkin A, Von Aspern K, Tolboom H, Gadelkarim I, Eitz C, Misfeld M, Borger MA, Davierwala PM. Total Arterial Multivessel Minimally Invasive Coronary Artery Bypass Surgery: 5-Year Outcomes. Ann Thorac Surg. 2024 Nov;118(5):1044-1051

