

# Shock Cardiogeno: Gestione delle Complicanze Meccaniche.

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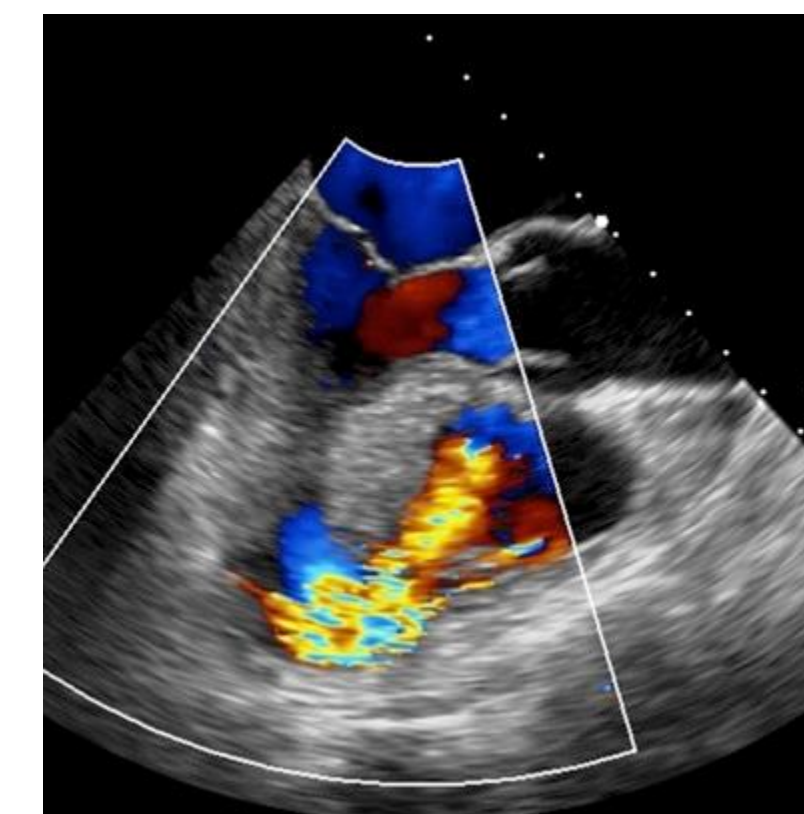
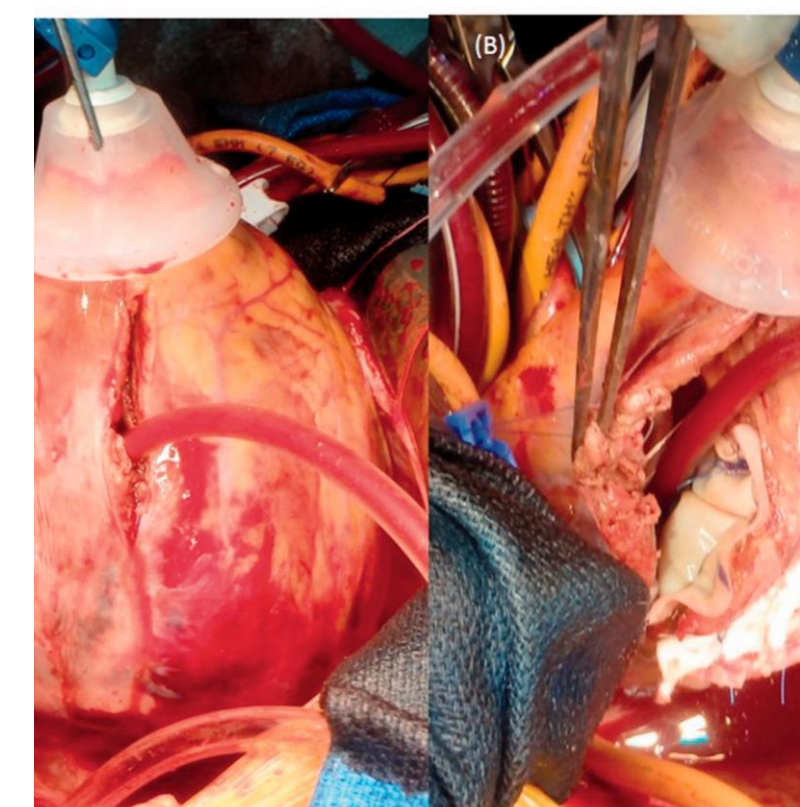
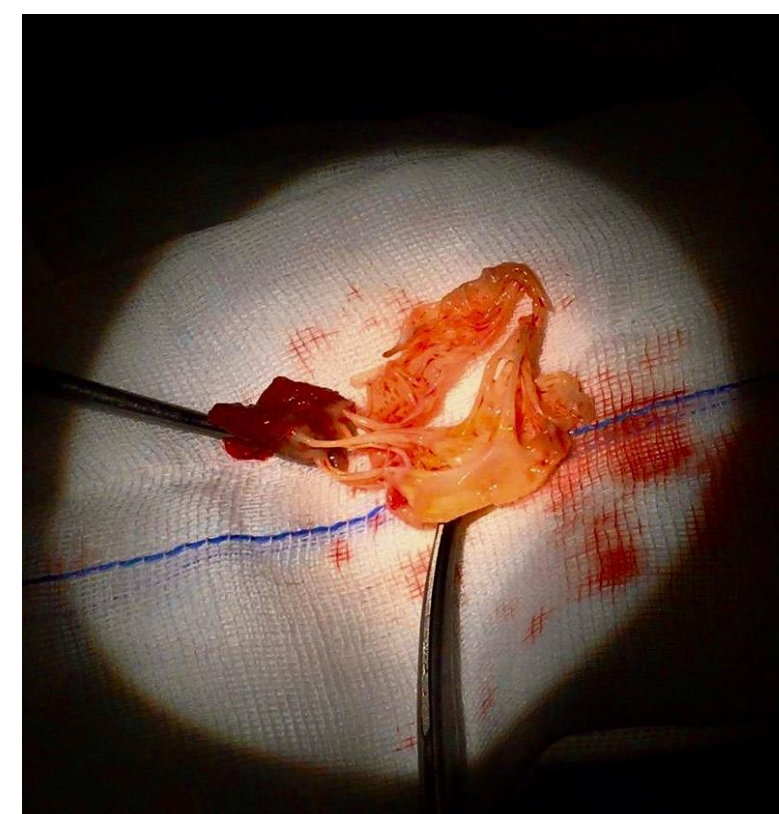
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# Stato dell'arte AHA

Post-acute myocardial infarction (AMI) mechanical complications are associated with considerable mortality and morbidity.

These complications include :

- papillary muscle rupture (PMR)
- ventricular septal rupture (VSR)
- free-wall rupture (FWR)
- ventricular aneurysm



## Editorial

### Overview of prevalence, trends, and outcomes of post myocardial infarction mechanical complications

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# HEMODYNAMIC IMPROVEMENT

Strategies for improving hemodynamic stability:

- *Short Term MCS*

1. *IABP*
2. *ECMO*
3. *Impella c.p.*
4. *Impella 5.5.*

In patients who are not suitable for surgical treatment:

- *Long Term MCS:*

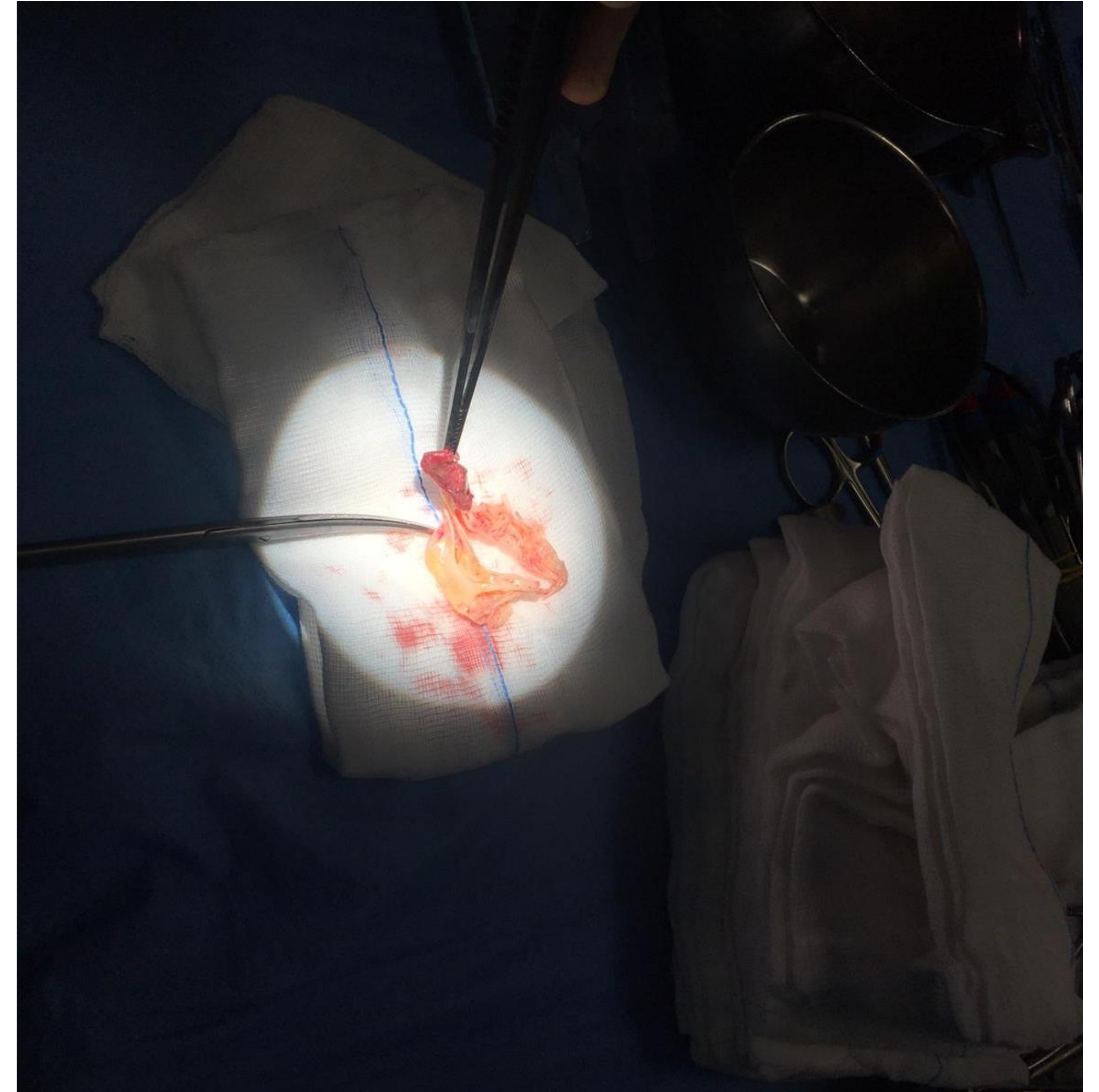
1. *Heart Mate III*
2. *Carmat*

- *Heart Transplant*

# Papillary muscle rupture (PMR)

0,26%

- PLM
- Insufficienza Mitralica Acuta
- Diagnosi ecocardiografica
- Monitoraggio invasivo.
- Trattamento immediato mediante: inotropi. I.A.B.P. NIV o IVS.
- Incidenza bassa
- mortalità ospedaliera 10 - 40%



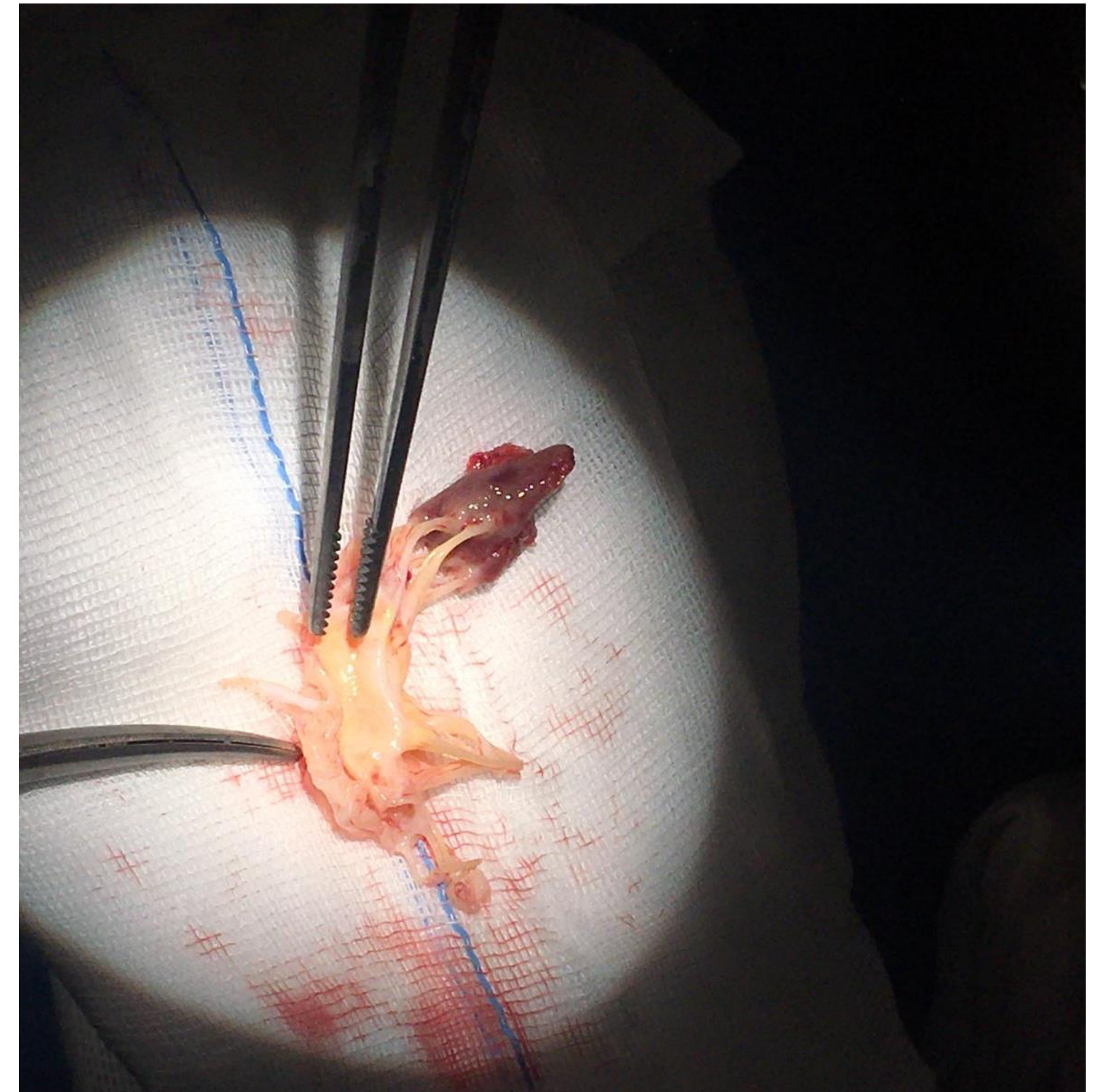
# Chirurgia cardiaca

## Suggestions for Clinical Practice

Emergency mitral valve replacement is the treatment of choice, but repair, typically for patients with partial PMR and stable hemodynamics, can be considered by surgeons with technical expertise in MV repair

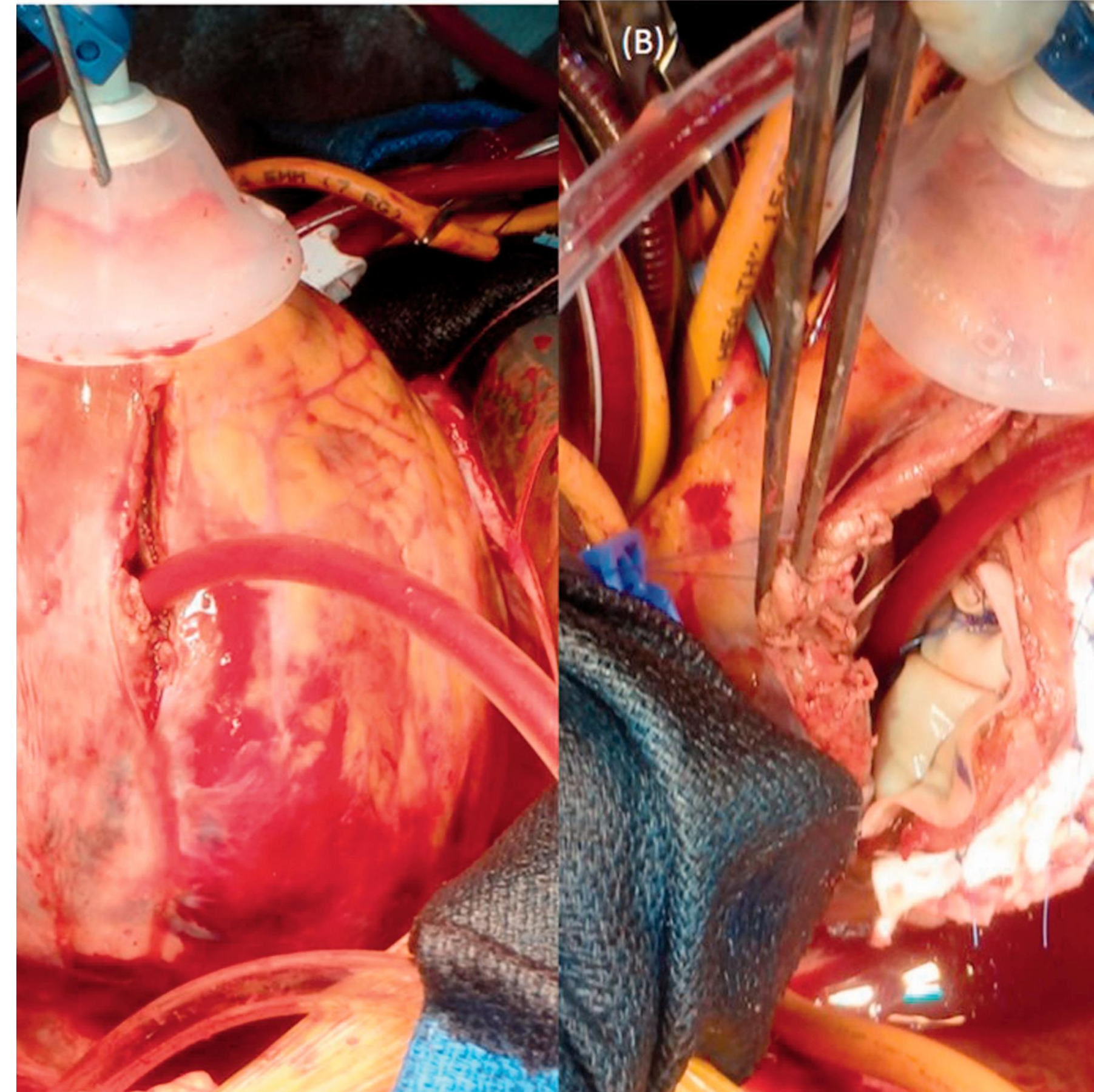
Medical management as bridge to more advanced therapy can be considered in patients with severe MR secondary to PMR and complicated by cardiogenic shock.

- The choice of bioprosthetic versus mechanical mitral valve replacement should be patient-centered and the decision should incorporate factors including age and need for prolonged anticoagulation therapy.
- In select patients with prohibitive surgical risk, transcatheter edge-to-edge mitral valve repair can be considered as part of a “Heart Team” approach to management.
- Concomitant CABG can be performed to achieve optimal revascularization with similar operative mortality to mitral valve surgery alone.
- Patient preferences and values are an important consideration in any high morbidity/mortality treatment choices.
- While mitral valve surgery is the standard of care, in patients with contraindications to surgery, medical management as a bridge to candidacy for MVR, transcatheter edge-to-edge repair, and temporary mechanical support as a bridge to long term ventricular assist device or heart transplantation can be considered



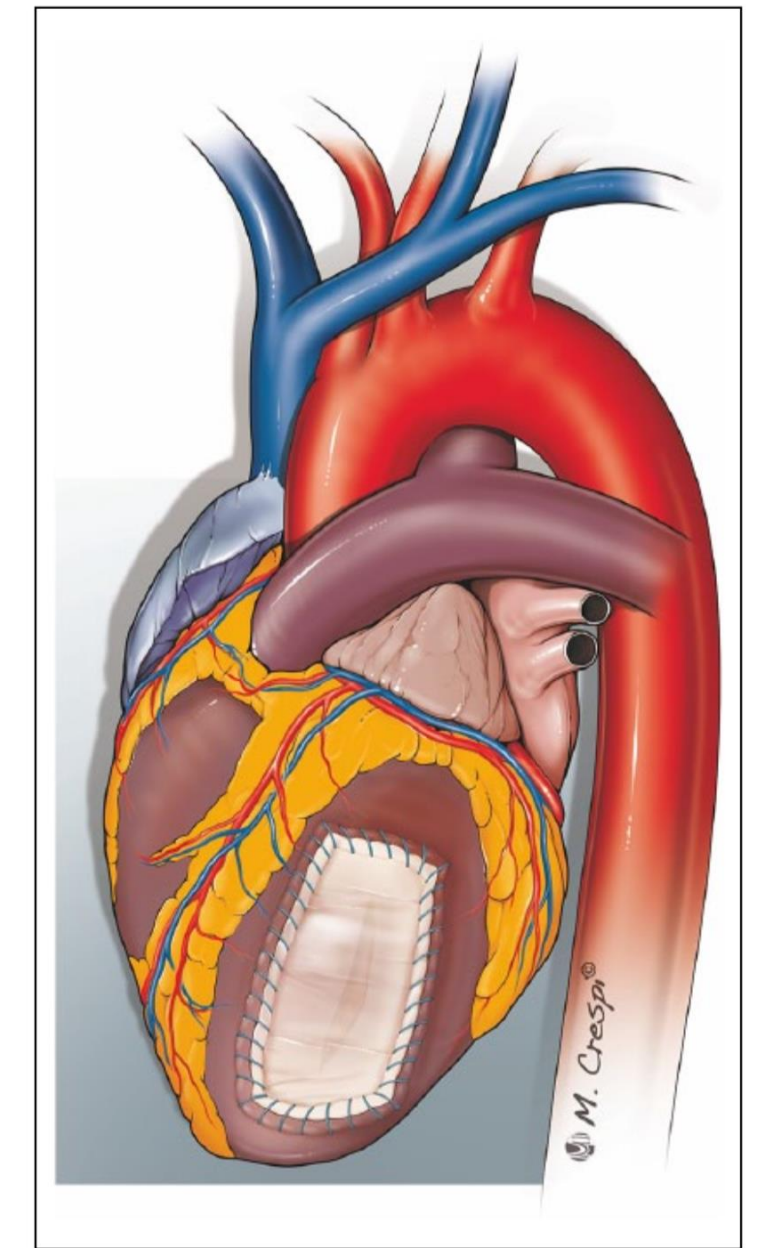
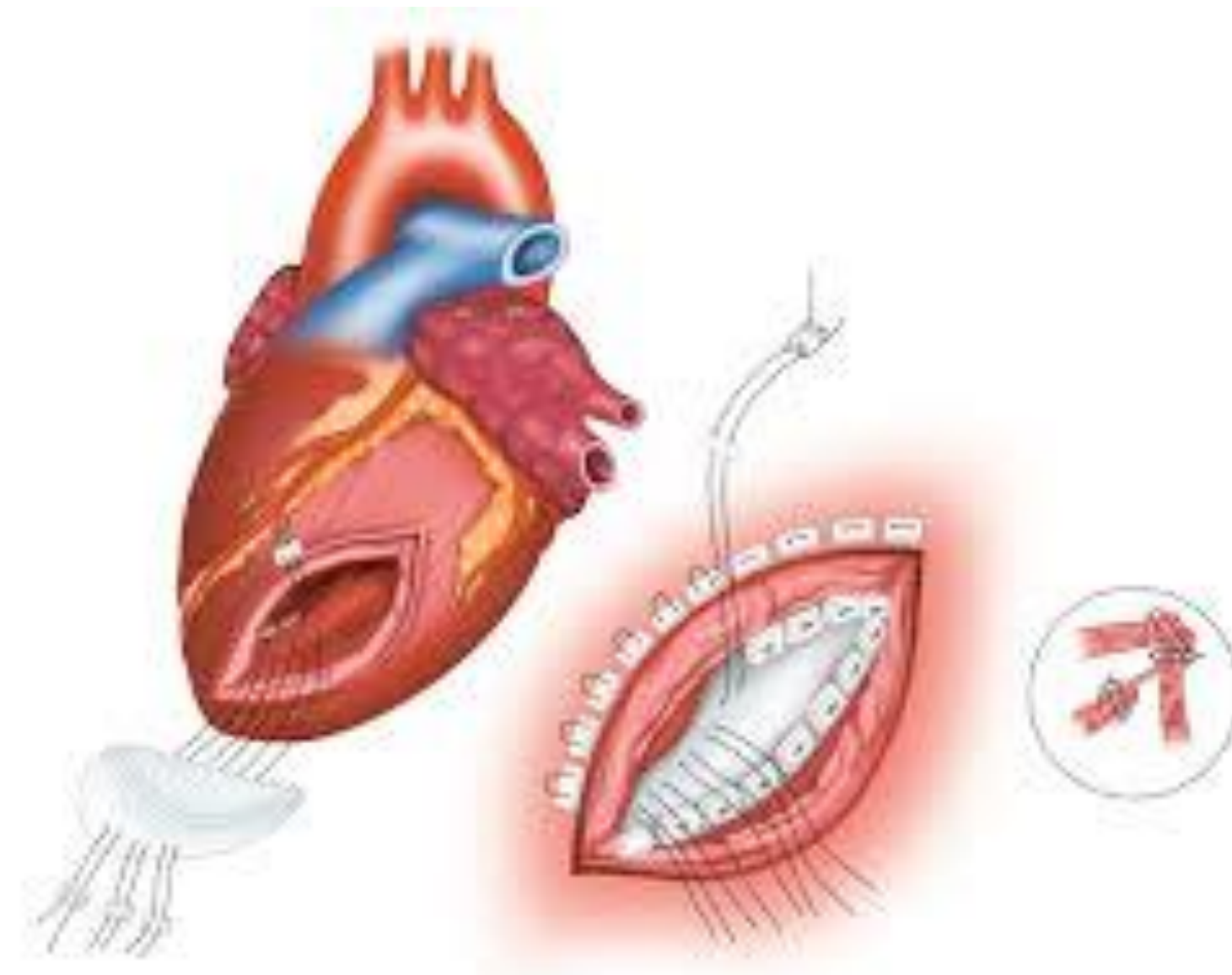
# FREE WALL RUPTURE

- Free wall rupture is rapidly fatal, but occasionally a prompt bedside echocardiogram confirms the diagnosis and warrants emergent surgical correction.
- While surgery can be lifesaving, the hospital mortality for patients who underwent surgical repair is in excess of 35%.



# Suggestions for Clinical Practice

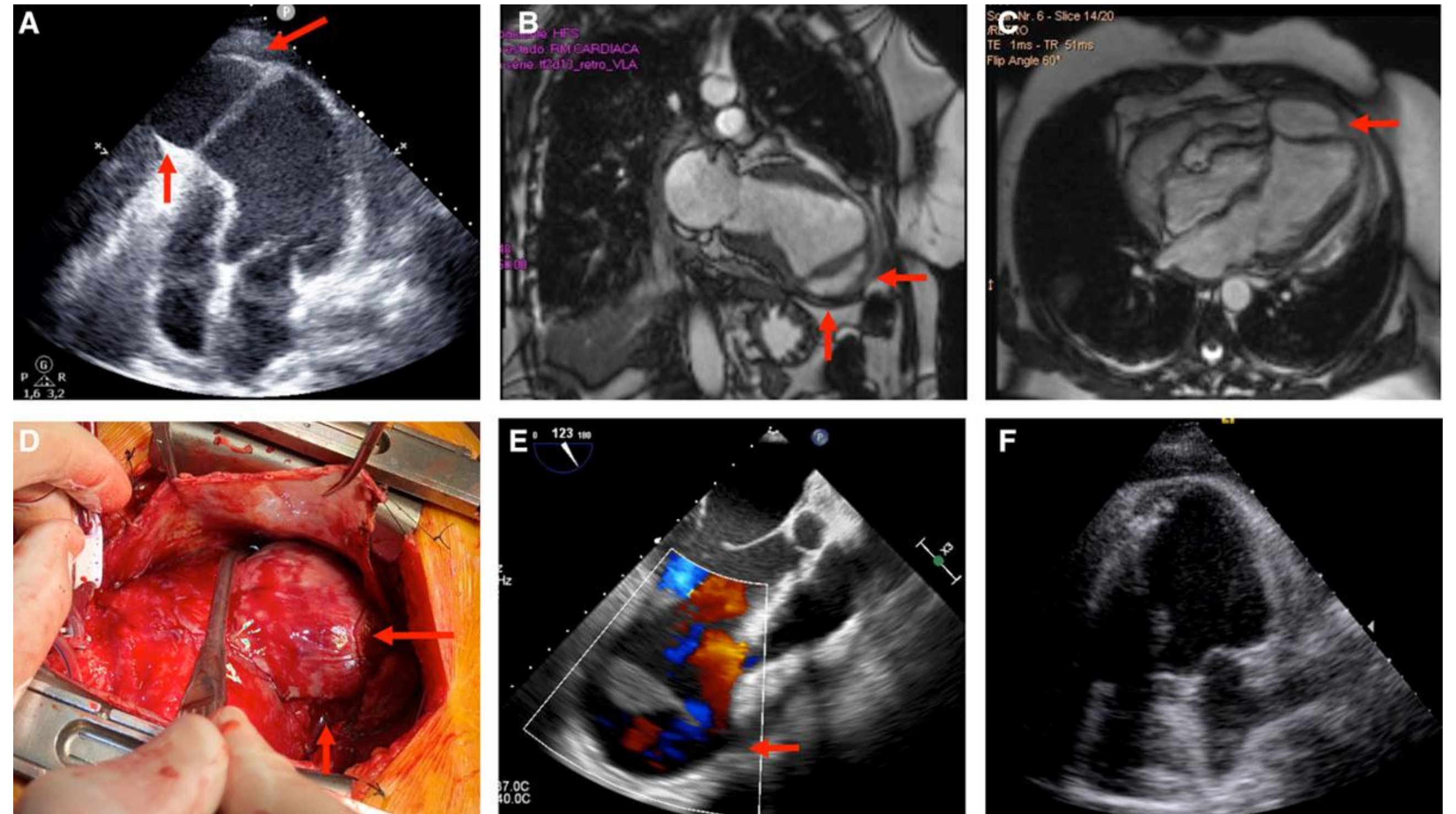
- Free wall rupture, a devastating complication of AMI with delayed or no reperfusion, usually results in sudden cardiac death.
- High clinical suspicion, prompt diagnosis confirmed by echocardiography and immediate surgery are needed; ECMO may be needed for pre-operative stabilization.
- While surgical technique for management of FWR continues to evolve, a primary patch repair that covers the defect, and when feasible a sutureless repair utilizing a patch and glue or a collagen sponge patch, can be used in a small subset of patients as an adjunct therapeutic option.



**Figure 6.** Patch covering technique. A patch of pericardium is sealed on the infarcted area using surgical glue and fixed with a running Prolene® suture on the surrounding healthy myocardium.

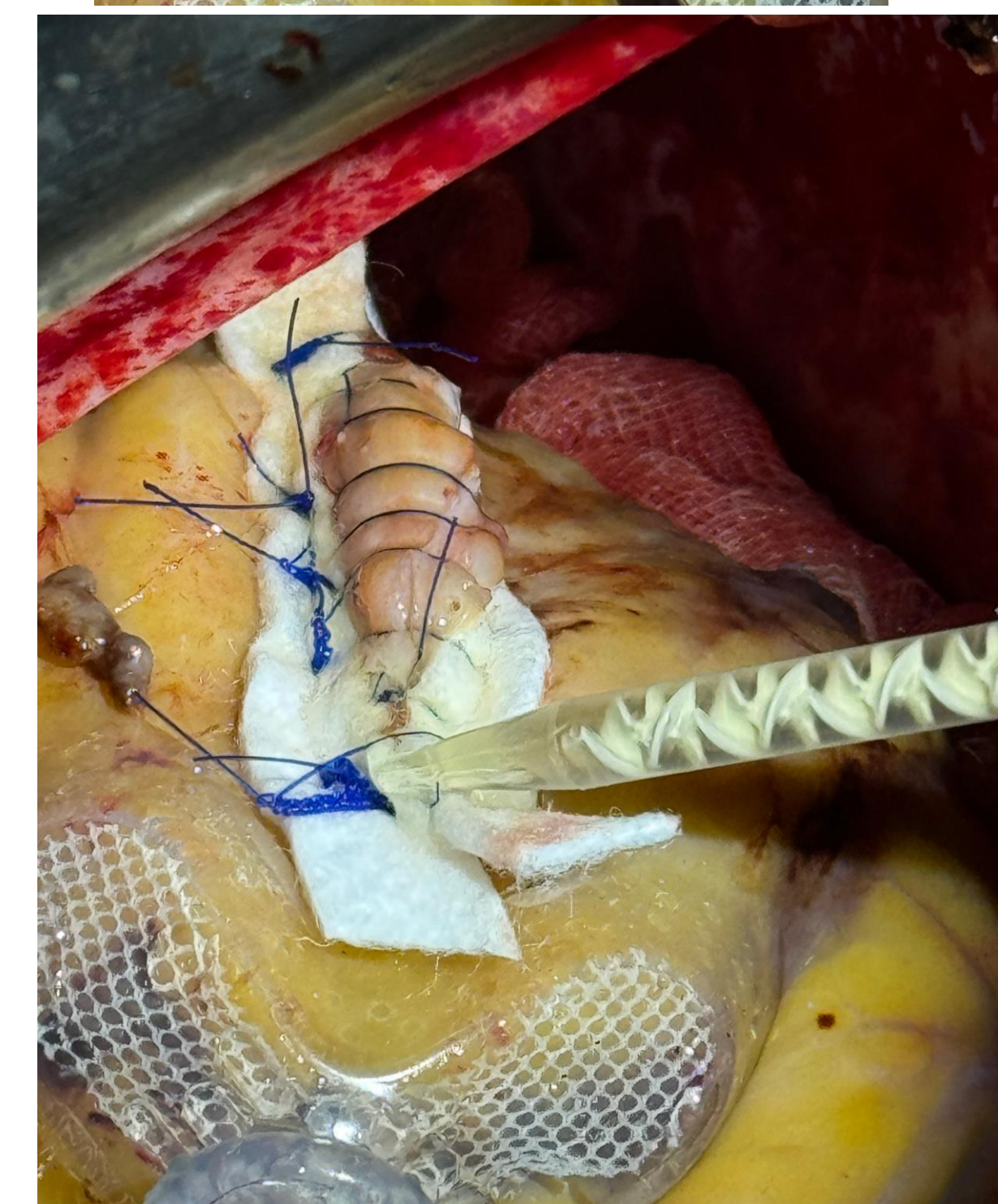
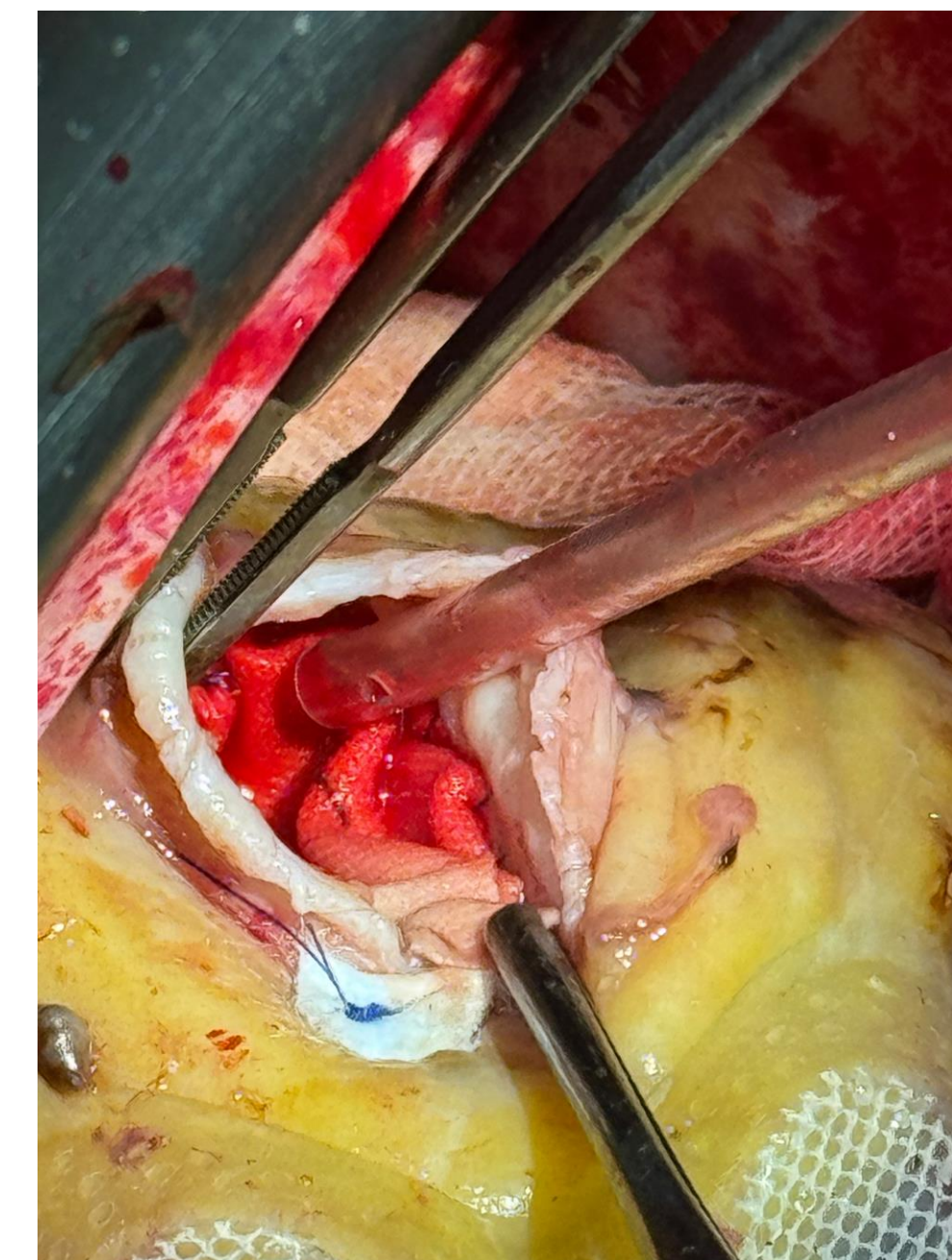
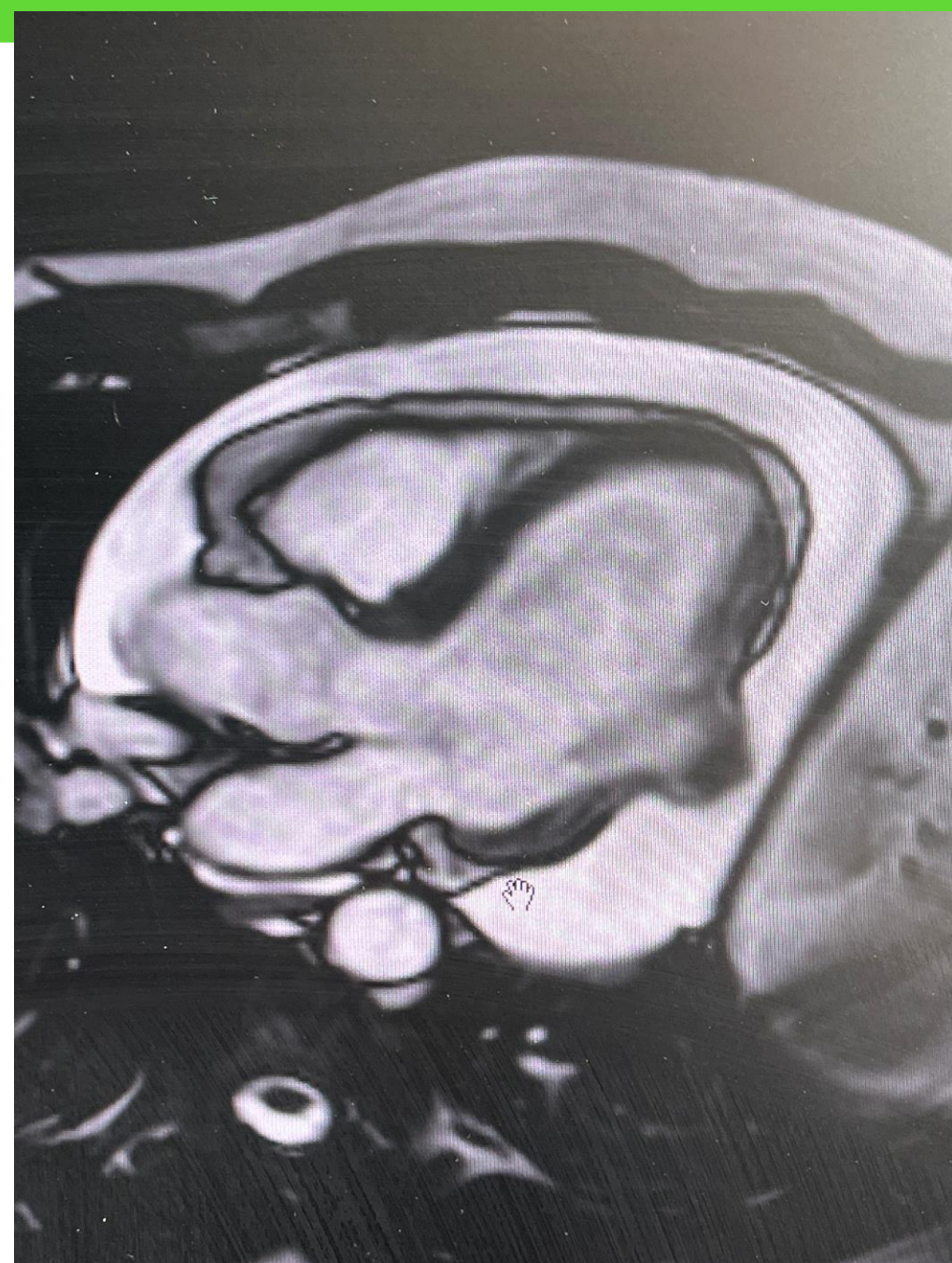
# LEFT VENTRICULAR PSEUDOANEURYSM AND LV ANEURYSMS

- Left ventricular pseudoaneurysms are a rare complication of myocardial infarction representing rupture of the myocardium, contained by pre-existing pericardial adhesions, most commonly in the posterior or lateral walls of the heart
- Pseudoaneurysm with small necks can be repaired with pledgeted sutures buttressed by polytetrafluoroethylene felt, but Gore-Tex, pericardium, or a double patch Dacron can also be utilized to repair the defect with good surgical outcomes.

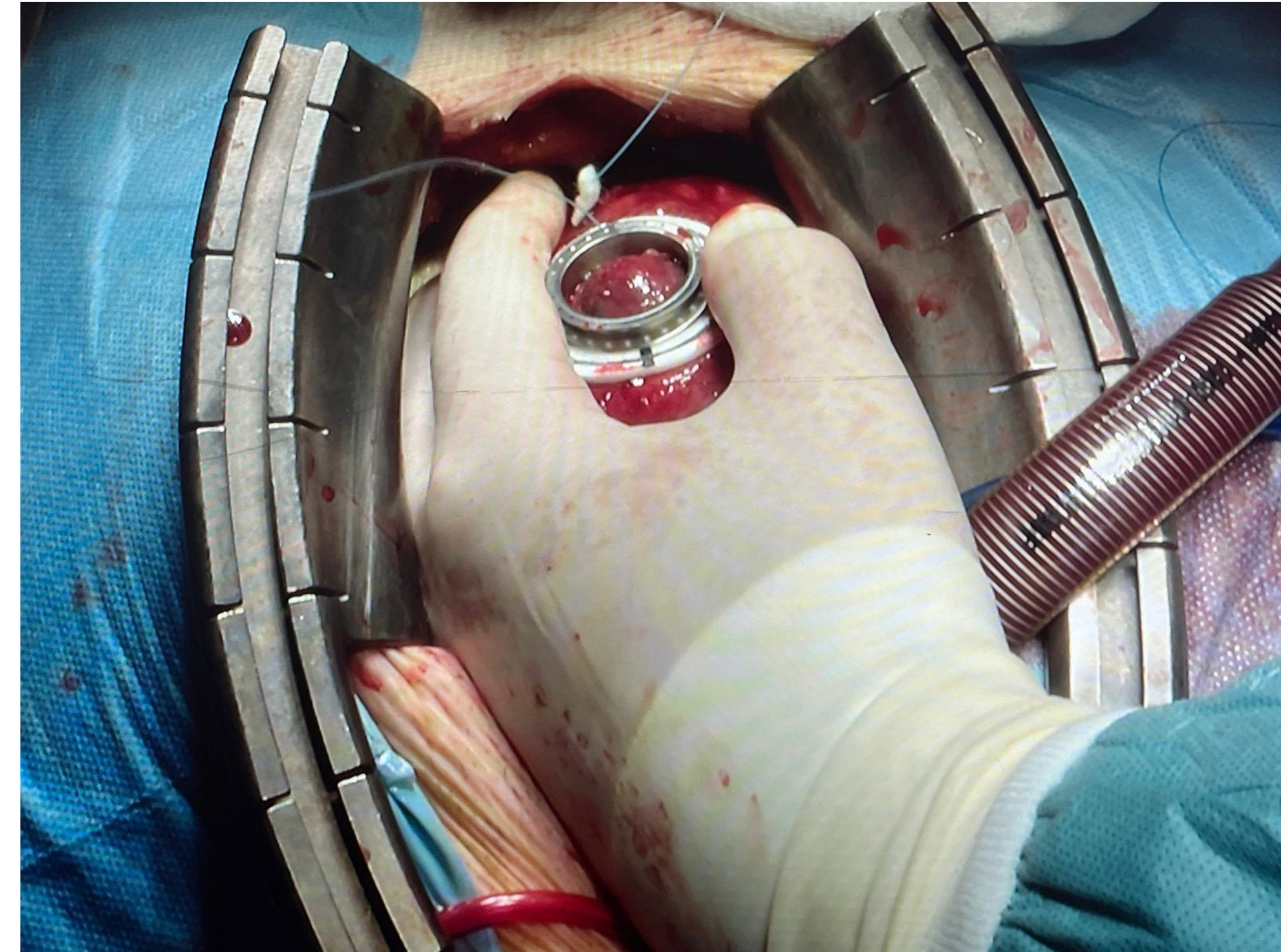




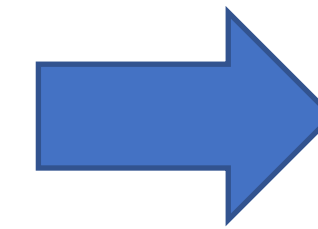
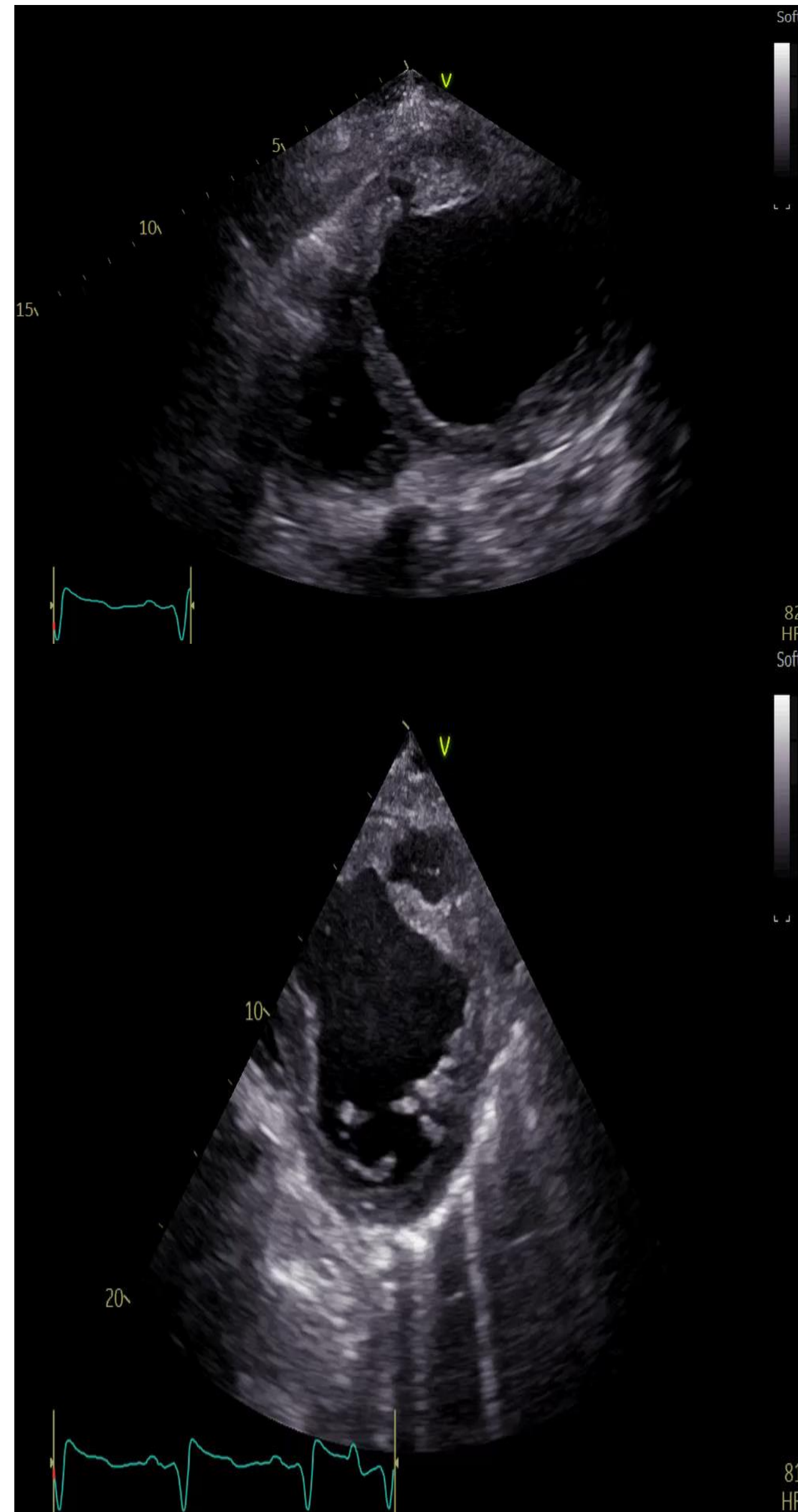
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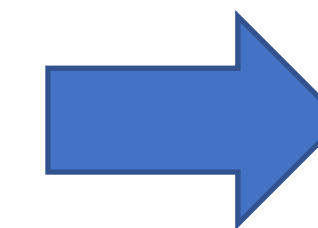
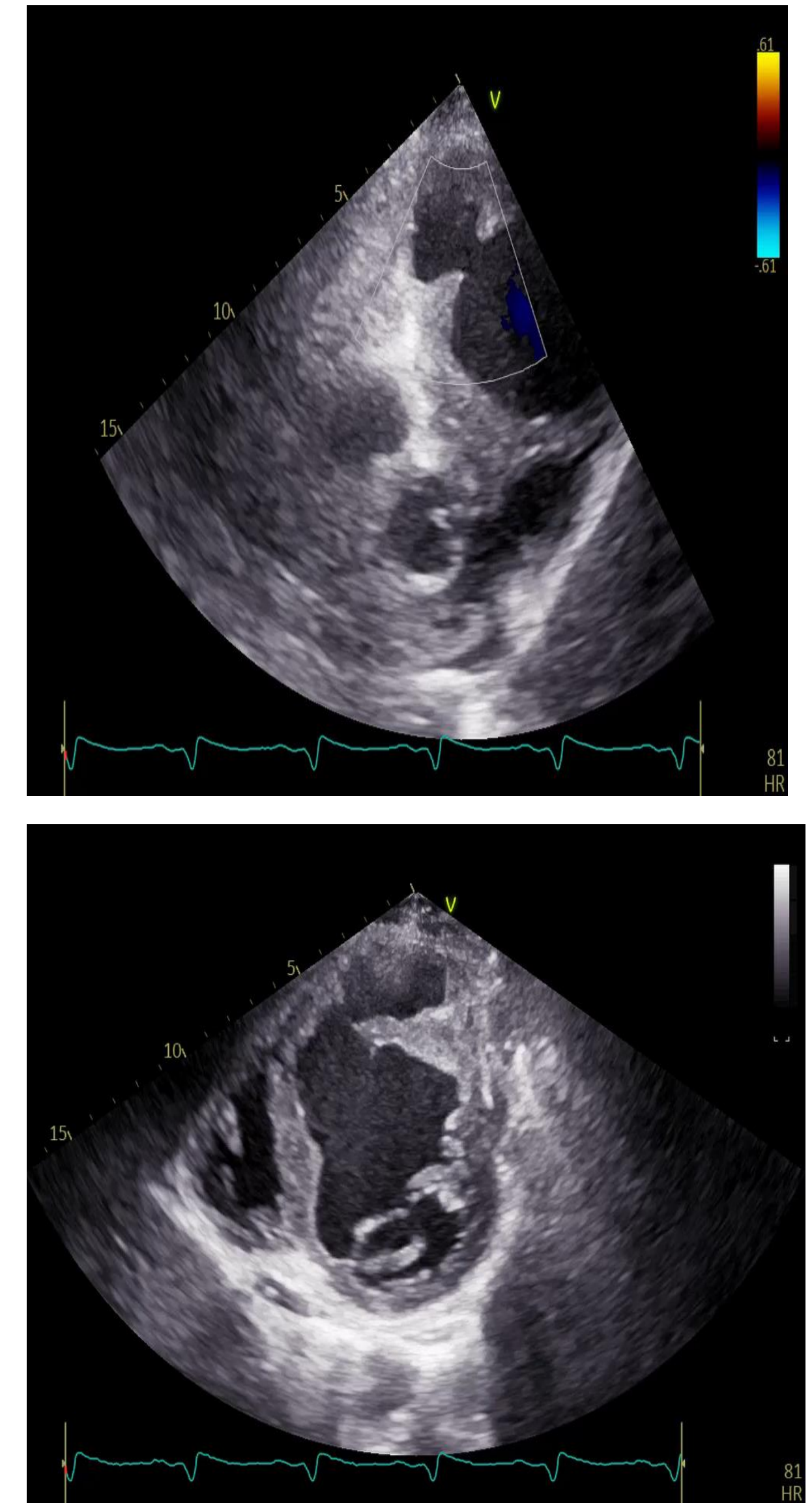
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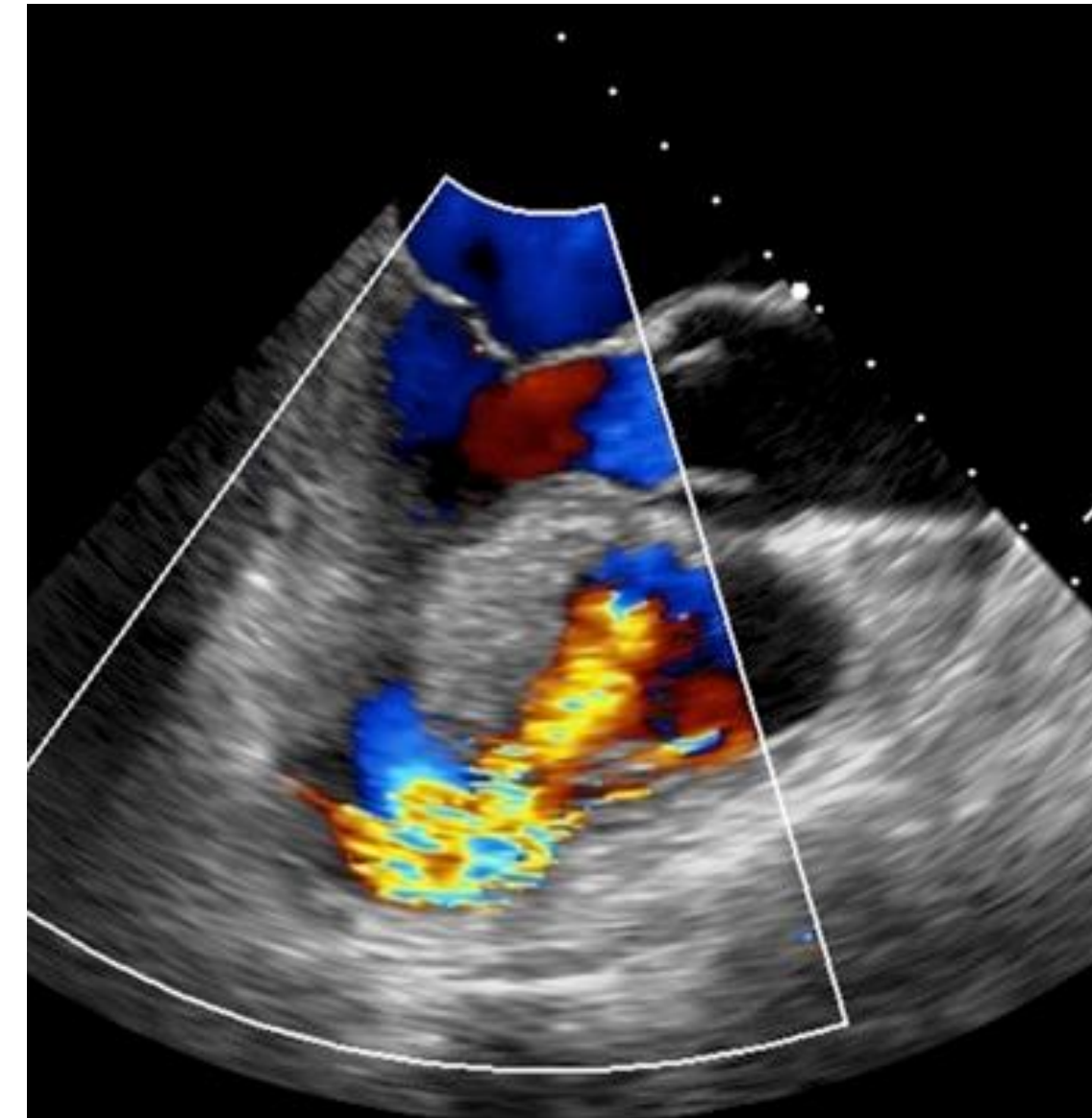
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**Progressione delle dimensioni della breccia dello pseudo-aneurisma localizzata al segmento medio della della parete anteriore del Ventricolo sinistro.**

# VENTRICULAR SEPTAL DEFECT

- Typically occurring three to five days post-infarction
- Symptoms may include dyspnea and orthopnea,
- and clinical examination often reveals hypotension
- Echocardiography is diagnostic



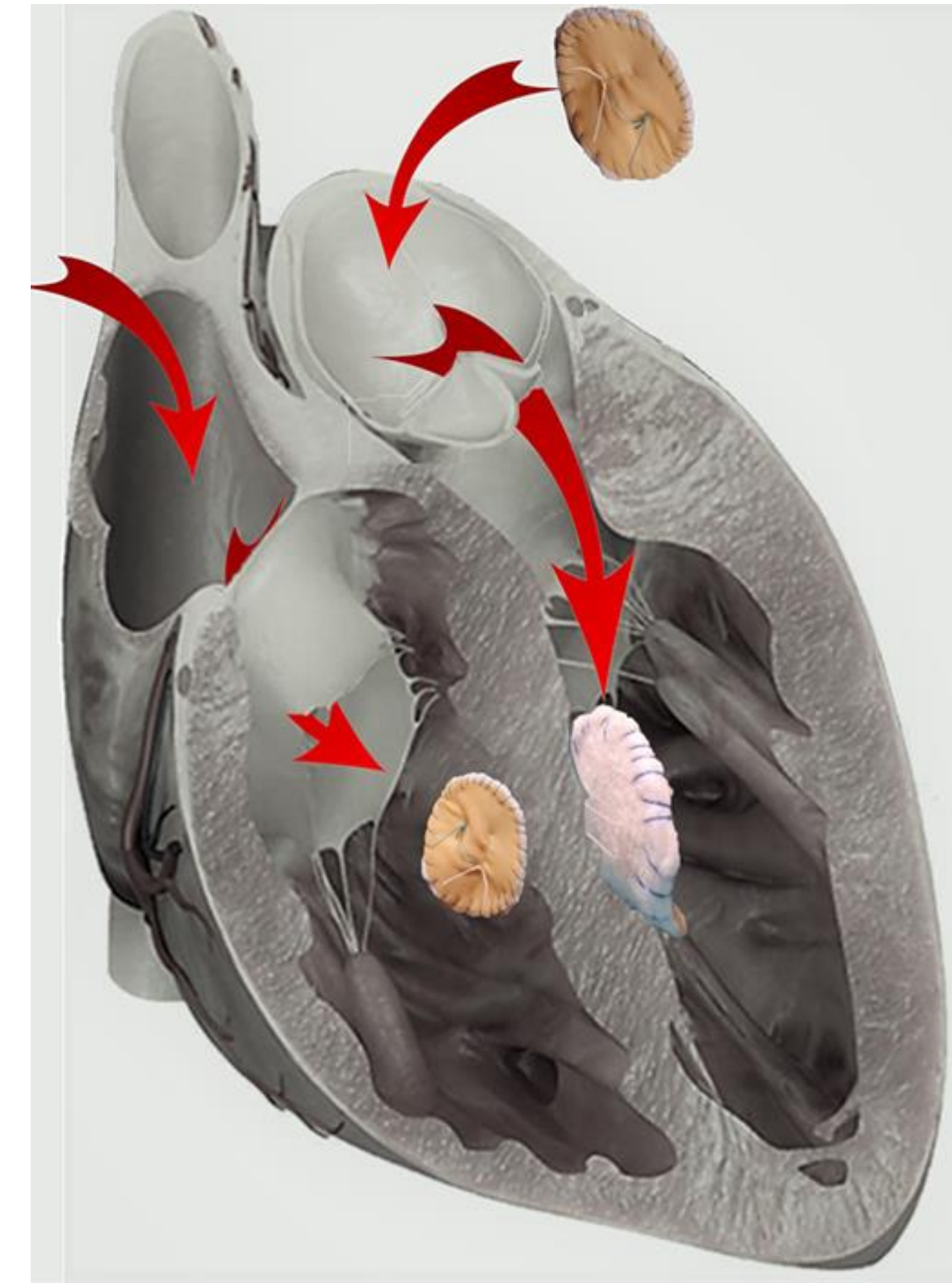
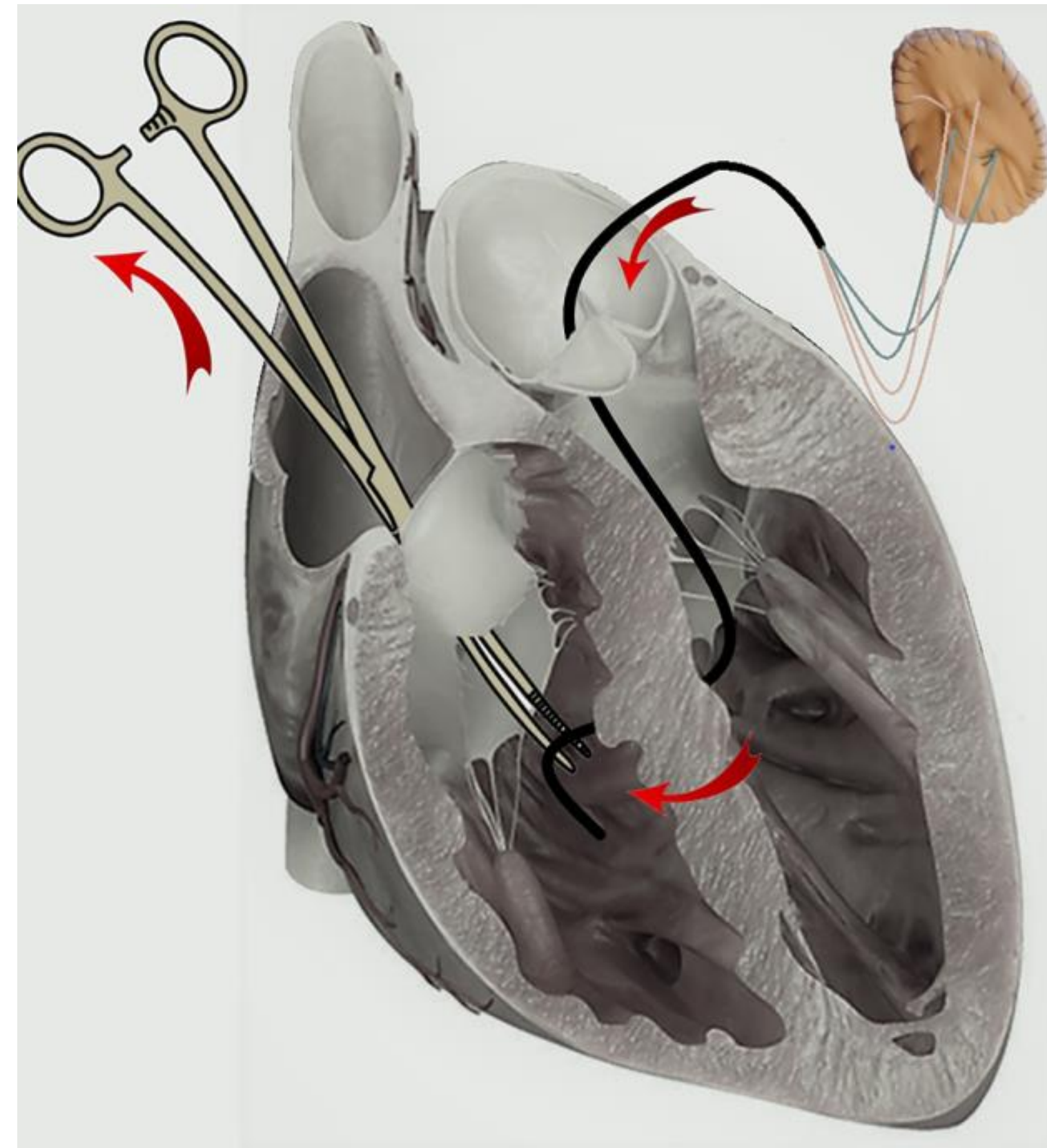
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## Suggestions for Clinical Practice

- high mortality associated with uncorrected defects approaching 80% at 30 days
- Effective afterload reduction to decrease the left-to-right shunt is essential: intra-aortic balloon pumps with pharmacotherapy are used in over 80% of emergency and 65% of urgent repairs.
- When a patient presents with multi-organ failure, potential
- support with ECMO may be considered to allow for improvements in end-organ failure as a bridge to surgical candidacy
- Patients severely compromised by multi-organ failure may benefit from biventricular mechanical support or ECMO with percutaneous or surgical left ventricular vents, allowing end-organ recovery before definitive surgery

## ★Emergency Surgery

- Emergency surgery is indicated for patients with cardiogenic shock and/or pulmonary edema refractory to mechanical circulatory support.
- Surgical techniques include primary repair (Daget) or infarct exclusion (David)
- Operative mortality following repair of a VSD remains at 40% and has not changed significantly in decades



## Transcatheter Repair of VSD

- In patients who are not suitable for surgical treatment of VSD repair due to excessive risk, percutaneous closure can be considered
- While procedural success approaches 89% (range: 80–100) in centers of excellence, hospital mortality remains excessively high and procedural complications are common.
- These include device embolization, arrhythmia, hemolysis, and failure of complete occlusion of the VSD requiring surgical repair.

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# Diagnosi precoce e trattamento immediato

Quindi necessità di contare su un gruppo di professionalità

Cardiologo interventista

Intensivista

Cardiologo clinico ed ecocardiografista

Heart failure /trasplant team

Cardiochirurgo

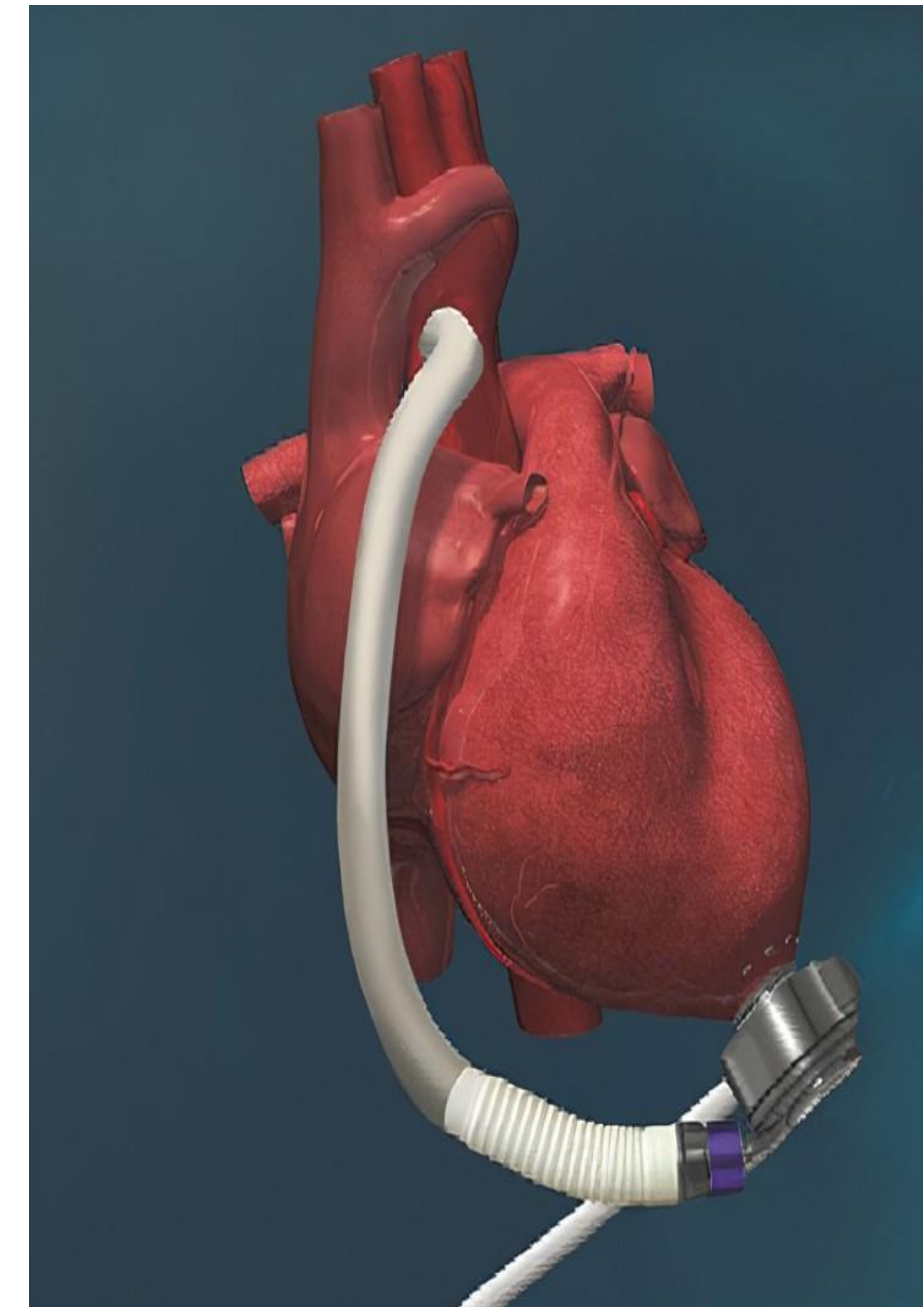


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## CARDIAC REPLACEMENT THERAPY

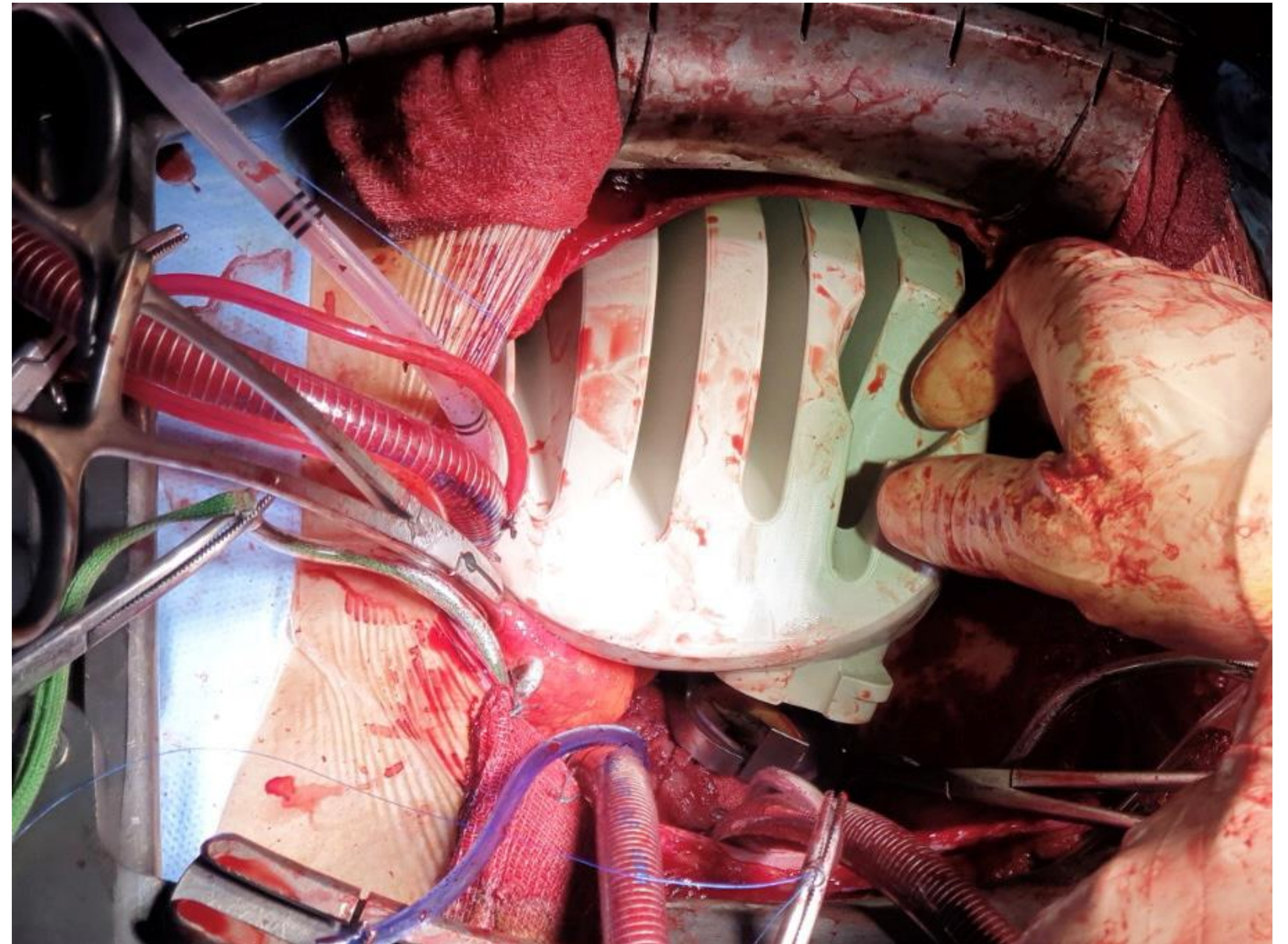
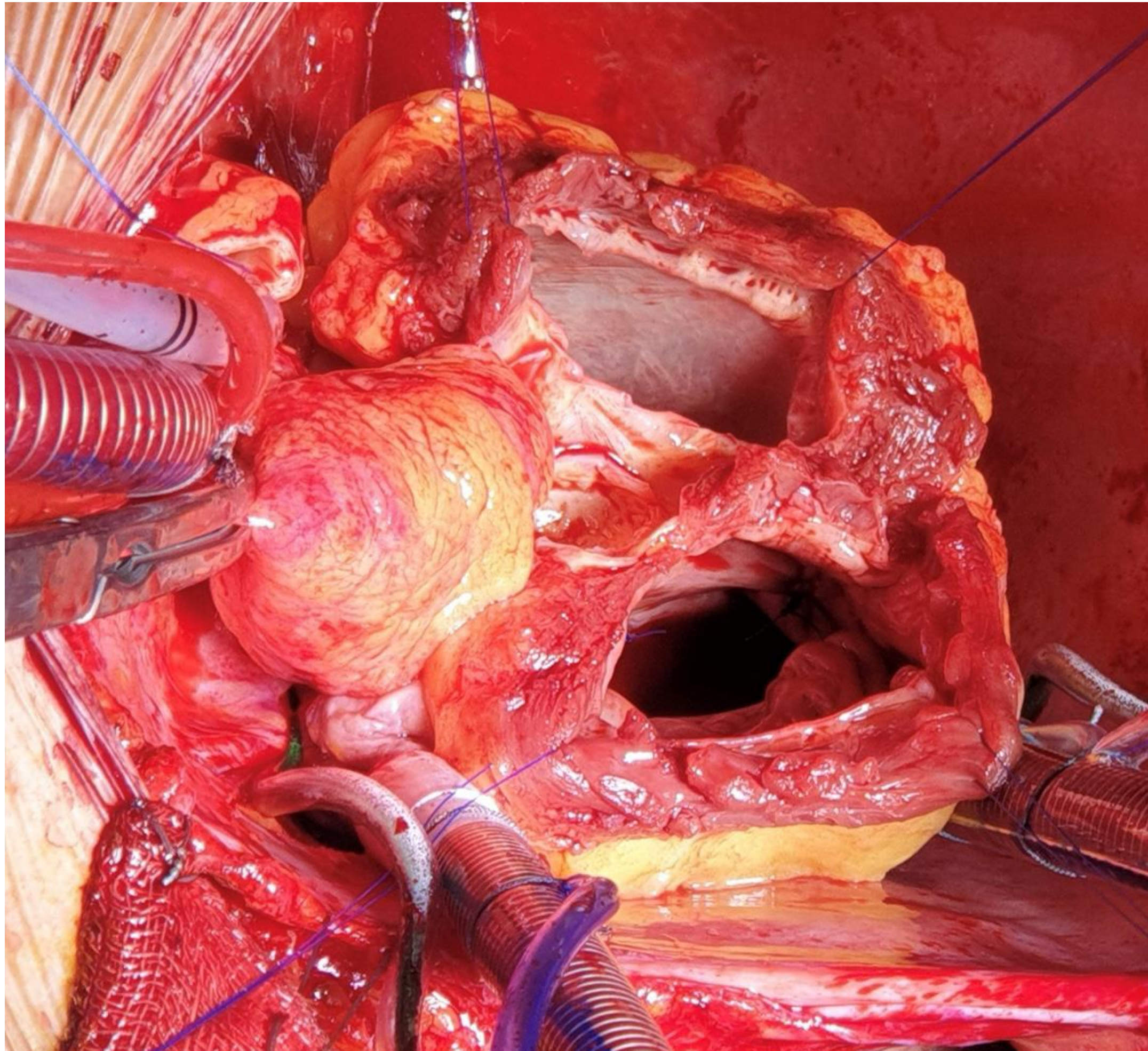
- In patients who are not suitable candidates for surgical and transcatheter therapies, including those with significant biventricular failure and with associated end organ impairment, evaluation for orthotopic heart transplantation or mechanical circulatory support may be considered



## Trapianto Cardiaco

# Carmat

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## DECISION-MAKING AND MULTIDISCIPLINARY TEAM-BASED APPROACH

- Heightened recognition of the complexities associated with contemporary cardiovascular care has led to a reappraisal of management practices and staffing requirements within the modern CICU.
- Most mechanical complications of AMI are surgical emergencies. Early involvement of the cardiac surgeon to discuss optimal timing of surgery is of paramount importance.
- Multidisciplinary teams, that include cardiac intensivist, have the potential to improve adherence to best practice recommendations, decrease adverse events, and increase patient survival.

