

Coronary Bypass Surgery and Mechanical Circulatory Support in Penetrating Heart Injury

Nikita Chibisov, Igor Glushenko, Pavel Zhezhuk, Anna Komarova, Elnar Mekhtiev
Botkin Hospital, Moscow, Russian Federation



Background

Penetrating cardiac injuries are rare and associated with high mortality. Major complications include pericardial tamponade, acute ischemia, arrhythmias, and myocardial dysfunction. Rapid diagnosis and multidisciplinary intervention are critical. VA-ECMO is a valuable bridge to surgery in cardiogenic shock but comes with inherent risks such as inflammation, coagulopathy, and infection. Literature on successful use of VA-ECMO combined with emergency CABG in such trauma settings remains limited.

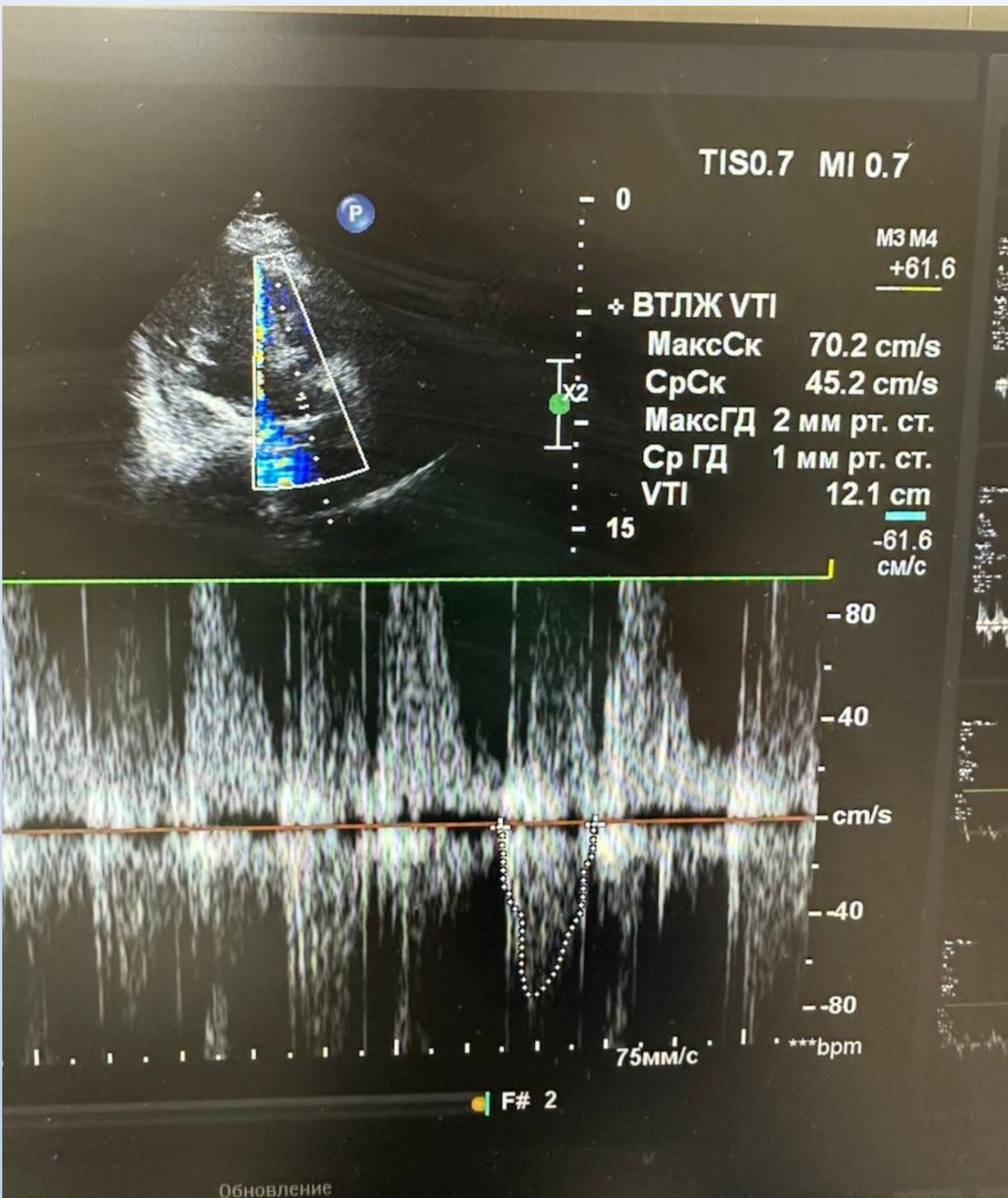
Case Description

37-year-old male with anterior chest stab wound. Initial findings: hypotension (SBP <70 mmHg), confusion, signs of tamponade. Emergency thoracotomy: RV injury repaired; VFib treated. Persistent shock led to angiography revealing RCA occlusion and LAD stenosis. Peripheral VA-ECMO initiated; emergency CABG performed to RCA and LAD without aortic cross-clamping. VA-ECMO support for 72 hrs. Weaning guided by echo and lactate. Discharged Day 41 with LVEF 52%.



Key Images

- Intraoperative ECMO circuit setup
- VTI and Doppler echo during weaning
- Infographic: Peripheral VA-ECMO configuration



Discussion

This case illustrates VA-ECMO as a life-saving bridge to emergency surgery in penetrating cardiac trauma with coronary involvement. Avoiding aortic cross-clamping reduced myocardial ischemia. Success relied on team effort:

- Anesthesiologists initiated ECMO and managed stability
- Interventional cardiologists performed angiography
- Cardiac surgeons performed CABG
- Cardiologists led recovery

Guidelines support early ECMO, structured weaning, and coordinated care.

Conclusion

Timely VA-ECMO enabled stabilization and revascularization. Team strategy led to full recovery. This supports ECMO protocol integration in cardiac trauma.

