

MEETING ABSTRACTS



Meeting Abstracts—10th National Congress of ITACTAIC—Italian Association of Cardiothoracic Anaesthesiology and Intensive Care

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The 2026 Meeting of ITACTAIC was held in Bologna, Italy, from 18–20 February 2026, bringing together experts, clinicians, and researchers to share advances and perspectives in applied cardiothoracic vascular anesthesia and Intensive Care. The meeting aimed to foster international collaboration, promote innovation, and support the exchange of cutting-edge knowledge across disciplines.

This year's program will highlight a comprehensive scientific agenda, featuring interdisciplinary sessions designed to integrate diverse fields and perspectives, alongside interactive sessions that encourage active participation and real-time discussion. Attendees will also benefit from a dedicated research lab, offering insights into emerging methodologies and ongoing studies, as well as practical workshops focused on skill development and hands-on learning.

Set in the culturally rich city of Bologna, the meeting provides a stimulating environment for academic exchange, professional networking, and the advancement of innovation in the field.

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A01. A protocol for assessment of early postoperative low back pain after open abdominal aortic aneurysm repair

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Background: Open repair of abdominal aortic aneurysm (orAAA) is associated with significant postoperative pain. While most studies focus on strategies to reduce surgical wound pain, a relevant proportion of patients experience early postoperative mild to moderate low back pain. These findings have been described mainly in endovascular surgery, whereas data in open surgery are limited; in a previous study, we found an incidence of 28% after orAAA. During orAAA, exclusion of the lumbar arteries within the replaced aortic segment may alter the paraspinal collateral network, potentially leading to transient reductions in paraspinal muscle perfusion. Such regional perfusion changes may contribute to the development of early postoperative low back pain.

Near-infrared spectroscopy (NIRS) allows non-invasive real-time monitoring of regional tissue oxygen saturation and may detect intraoperative paraspinal desaturation events. Thus, it might explore the association between intraoperative alterations and the occurrence and severity of low back pain.

Methods: This is an observational pilot study aimed at enrolling 45 patients undergoing elective infrarenal orAAA. Bilateral NIRS sensors are placed onto the paraspinal muscles at the L1–L2 or L2–L3 levels before anesthesia induction. Regional oxygen saturation and hemodynamic parameters are recorded at four time points: after induction (T0), 5 minutes after aortic clamping (T1), 5 minutes after aortic declamping (T2), and at the end of surgery (T3). Postoperatively low back pain is assessed up to 36 hours. Anesthetic management follows standard institutional protocols.

Results: The study is currently ongoing. Data analysis will focus on the incidence of paraspinal muscle desaturation, its association with hemodynamic parameters and incidence, timing, and intensity of postoperative low back pain.

Conclusion: This pilot study investigates the potential role of paraspinal muscle hypoperfusion due to aortic and lumbar replacement in the development of low back pain after open AAA repair. The findings may support the clinical relevance of the collateral network concept and contribute to improve monitoring and strategies for postoperative pain.

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A02. Cardiac power index as marker of Ventricular performance in open abdominal aortic aneurism repair: correlation with dp/dt

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Aim of investigation: The objectives are to evaluate intraoperative changes in CPI and dp/dt during orAAA and to assess their correlation at different surgical phases.

Methods: We retrospectively analyzed 143 patients who underwent orAAA at Humanitas Clinical Research Hospital (Milan, Italy) between 2021 and 2024. In addition to standard monitoring, invasive arterial waveform analysis was performed using the EV1000-FloTrac™ or HemoSphere system (Edwards Lifesciences, USA). Hemodynamic data were collected before aortic cross-clamping (baseline), after cross-clamping (Ao-XC), and after unclamping (Ao-UC). Changes over time were analyzed with ANOVA, and correlations were assessed using Spearman's test. CPI was calculated as $MAP \times CI/451$.

Results: Both CPI and dp/dt changed significantly during surgery. CPI values were 0.40 (0.34–0.50) W/m² at baseline, 0.40 (0.33–0.49) W/m² at Ao-XC, and 0.47 (0.39–0.58) W/m² at Ao-UC ($p = 0.0011$). Dp/dt values were 701 (552–876), 525 (415–692), and 711 (546–926) mmHg/s, respectively ($p < 0.0001$). A moderate correlation between CPI and dp/dt was observed at all phases ($r = 0.37–0.52$, $p < 0.0001$).

Conclusions: Aortic cross-clamping is associated with reduced cardiac contractility and efficiency, both of which

recover after unclamping. The moderate correlation between CPI and dp/dt suggests caution when using CPI alone to draw information intraoperative cardiac contractility.

Conflict of interest: None.

A03. Combining the national early warning score 2 with frailty assessment improves early identification of patients at risk of in-hospital cardiac arrest

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Aim of investigation: In old and frail patients, in-hospital cardiac arrest (IHCA) is associated with high mortality. Early warning scores such as the National Early Warning Score 2 (NEWS2) are widely used to detect clinical deterioration and facilitate early activation of Rapid Response System (RRS/MET). Nevertheless, their predictive accuracy in frail populations remains uncertain. This study aimed to assess whether integrating frailty measures with NEWS2 could better describe elderly IHCA patients.

Methods: We conducted a single-center, retrospective observational study in adult and frail patients (≥ 18 years) admitted to medical and surgical wards of the University Hospital of Siena who experienced IHCA between January 2022 and January 2024. Data on demographics, last NEWS2 before IHCA, Clinical Frailty Scale (CFS), Barthel Index (BI) and Charlson Comorbidity Index (CCI), were retrospectively collected and analyzed. Patients were stratified into three categories according to NEWS2: Stable (A), Potentially Unstable or Unstable (B) and Critical (C).

Results: Seventy patients were analyzed (mean age 76.9 ± 11.0 years; 56% male). The mean pre-IHCA NEWS2 score was 6.0 ± 3.5 , with 41% of patients classified as NEWS2-C, 48% classified as NEWS2-B and 11% classified as NEWS2-A. The NEWS2-A category showed higher BI and lower CFS than NEWS2-B and NEWS2-C ($p < 0.01$), while CCI and age did not significantly differ.

Conclusions: The association of NEWS2 with frailty scores could identify some elderly patients with limited pre-arrest physiological derangements but high frailty who suffered IHCA. These findings provide descriptive insights that may inform monitoring strategies for “at-risk” elderly patients facilitating early RRS/MET activation and potentially preventing IHCA.

Funding: None.

Conflict of interest: None.

A04. The use of protein C concentrate in an adult septic patient after cardiac surgery: case report

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Aim of investigation: Sepsis causes a dysregulated inflammatory response and excessive activation of coagulation, which may lead to disseminated intravascular coagulation (DIC), multiorgan dysfunction (MOF), and high mortality. Protein C (PC), a key modulator of the coagulation system involved in inflammatory processes, is often reduced during sepsis. PC deficiency results in increased coagulation activation with intravascular thrombus formation. Several case reports have described reduced mortality in adult patients with sepsis-induced MOF after early administration of Protein C concentrate (Ceprotin®, Baxter).

Methods: A 37-year-old hypertensive, obese man with a history of ascending aortic replacement underwent frozen elephant trunk (FET) surgery with supra-aortic trunk debranching for new-onset aortic dissection. The postoperative course was complicated by intestinal ischemia, treated with ileal resection and ileostomy. After further surgical revision for abdominal collections, the patient developed septic shock requiring high-dose vasopressor support (norepinephrine 0.2 mcg/kg/min and empresin 0.03 IU/min). Due to worsening inflammatory markers (platelets $378 \times 10^3/\mu\text{L}$, CRP

19.7 mg/dL, PCT 29.1 mcg/mL, endotoxemia 0.78) and evidence of MOF (SOFA score 11), a course of Toraymixin was administered without clinical benefit.

Given persistent sepsis (platelets $50 \times 10^3/\mu\text{L}$, CRP 27.4 mg/dL, PCT 56.83 mcg/mL, endotoxemia 0.99), PC activity was measured and found to be 34% (normal range 65–140%). PC concentrate was administered at 80 IU/kg. After 6–8 hours, PC activity increased to 103%, and no second dose was given. The circulating activated PC levels remained stable after 10 days (98%).

Results: Over the following days, inflammatory markers progressively improved (platelets $275 \times 10^3/\mu\text{L}$, WBC $8.47 \times 10^3/\mu\text{L}$, CRP 6.6 mg/dL, PCT 6.6 mcg/mL), vasopressor requirements decreased (norepinephrine 0.03 mcg/kg/min), and the SOFA score improved from 11 to 6.

Conclusion: This case shows a significant improvement in clinical status, inflammatory markers, and coagulation parameters after administration of Protein C concentrate in sepsis-induced MOF.

A05. Sustainability in cardiothoracic and vascular perioperative care: evidence, frameworks, and research frontiers

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Background and Objective: Perioperative pathways in cardiothoracic and vascular surgery are among the most resource-intensive domains in healthcare, accounting for a disproportionately large environmental footprint. However, there remains a dearth of global awareness and guidance on sustainable surgical practices.

Evidence and Frameworks: In a life-cycle assessment (LCA) [1] of the coronary artery bypass graft (CABG) patient journey, the operating room (OR) emerges as the dominant sustainability hotspot, accounting for approximately 76% of total emissions (314 of 414 kg CO₂ equivalents per patient). The largest contribution to the total emissions arises from single-use OR disposables (162 kg CO₂e, 39%), primarily consisting of cardiopulmonary bypass-related components (CPB circuit, drapes, cell-salvage sets, gowns). In comparison, the ICU phase accounts for 19% (77 kg CO₂e) and anaesthesia-related emissions are comparatively minimal in this cohort [2]. A preliminary analysis of five patients undergoing video-assisted thoracoscopic surgery (VATS) revealed a remarkably high utilization of resources, with a mean of 1254 products utilized per patient, three-quarters were disposable. The largest share of consumption was accounted for by ORs, anaesthesia, and surgical activities. The environmental impact of hospitals extends beyond the scope of medical devices; non-clinical factors, such as hospital food, also play a significant role in this regard [3]. In endovascular aortic repair (EVAR), preliminary studies indicate that the utilization of regional anaesthesia and the implementation of fast-track recovery pathways have the potential to minimize the environmental footprint without adversely affecting clinical outcomes besides up to 80% of surgical solid waste is produced prior to the patient’s entry into the operating theater [4, 5].

Conclusions: The paucity of data on LCAs, the limited implementation of circular economy principles, and the reliance on single-use plastic packaging indicate that sustainable cardiothoracic and vascular care must focus mainly on the OR. Industrial innovation, standardized LCAs and multidisciplinary team-led programs are required to reduce resource use.

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A06. Opioid-free anesthesia as a potential alternative in cardiac surgery: a retrospective analysis

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Aim of investigation: Intraoperative pain management in cardiac surgery represents a significant challenge for anesthesiologists. Opioids are currently the most commonly used drugs in cardiac anesthesia, despite being associated with adverse effects. Opioid-free anesthesia (OFA), as part of an Enhanced Recovery After Surgery (ERAS) pathway in cardiac surgery, based on the intraoperative use of dexmedetomidine, ketamine, lidocaine, and magnesium sulfate, may provide improved intraoperative pain control.

Methods: This retrospective study compared two groups of 15 patients each (Group A: OFA and Group B: opioid-based anesthesia) undergoing myocardial revascularization with or without valve replacement, or single valve replacement, under cardiopulmonary bypass. Intraoperative nociception was assessed and guided using the Nociception Level (NOL) index. The NOL Index is an AI-driven, non-invasive monitoring system that quantifies a patient's physiological nociceptive response during surgery, providing a score ranging from 0 to 100 via a finger probe, with values >25 indicating insufficient analgesia and values <10 suggesting potentially excessive analgesia.

According to the ERAS protocol, extubation time was also evaluated between the two groups, with fast-track extubation defined as occurring within 4 hours. Postoperative opioid administration was not required in Group A, whereas morphine was the most commonly used opioid in Group B.

Analysis: Comparison of intraoperative NOL index values (<25) between the two groups was performed using Student's *t*-test, showing statistical significance ($p = 0.04$; $p < 0.05$), indicating better control of nociceptive stimuli in Group A. Extubation time between groups was analyzed using the chi-square test, demonstrating statistical significance ($p = 0.01$), with patients in Group A achieving faster extubation times (<4 hours).

Results: The study demonstrates that opioid-free anesthesia is associated with superior intraoperative nociceptive control and a significant reduction in postoperative extubation time in patients undergoing cardiac surgery.

Conclusion: Opioid-free anesthesia in cardiac surgery may improve perioperative outcomes, including better nociceptive control and faster extubation; however, randomized controlled trials are needed to confirm these findings.

Funding: This study received no external funding.

Conflict of interest: The authors declare no conflict of interest.

A07. Malignant cerebral edema after cardiopulmonary bypass: from a poor prognosis to a life-giving outcome

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Introduction: Neurological injury after cardiac surgery is a severe complication associated with higher postoperative mortality and it is more frequent in patients undergoing cardiopulmonary bypass (CPB). The main causes of neurocognitive damage are cerebral hypo- and hyperperfusion, embolic phenomena, hyperthermia, and electrolyte disturbances secondary to the use of cardioplegic solutions.

A 69-year-old patient presenting with angina due to critical coronary artery disease (CAD) underwent urgent coronary artery bypass grafting (CABG). The patient underwent cardiopulmonary bypass (CPB) as per routine, and myocardial protection was achieved using histidine-tryptophan-ketoglutarate solution (Custodiol HTK). After the first dose, an additional administration was required to optimize cardioprotection. During the procedure we observed severe hyponatremia (Na^+ 116 mEq/L) and polyuria. Weaning from CPB was uneventful, requiring minimal pharmacological support. Upon awakening in the intensive care unit, the patient developed generalized tonic-clonic seizures, confirmed on EEG. Deep sedation was therefore maintained and antiepileptic therapy started. Brain CT showed cytotoxic cerebral edema predominantly affecting the right hemisphere, later confirmed by magnetic resonance imaging (MRI). Subsequent imaging demonstrated progression of the edema with bilateral involvement. Clinically, the condition evolved into a vegetative state (GCS 6). After multidisciplinary evaluation of the neurological prognosis, the medical team decided to withdraw life-sustaining treatment. Besides, a controlled donation after circulatory death pathway was successfully undertaken.

Discussion: The patient presented with radiological evidence of diffuse cerebral edema. This condition is a nonspecific entity which often has a multifactorial etiology. In this case, the main hypothesis include ischemic injury due to

embolism, diffuse insult from cerebral hypo-/hyperperfusion, and cytotoxic damage secondary to hyponatremia. Ischemic injury, which is readily identifiable on imaging, was excluded, as was hypo-/hyperperfusion syndrome—a condition characterized by impaired cerebral autoregulation, often related to accidental malpositioning of the arterial cannula during CPB. Such a mechanism would reasonably be associated with pressure differences between arterial lines during invasive monitoring, which were not observed.

The leading hypothesis is cytotoxic damage secondary to hyponatremia, consistent with the severe hyponatremia and polyuria during CPB, postoperative seizures and diffuse cerebral edema. During cardiac surgery, the use of HTK solutions frequently causes transient iso-osmolar hyponatremia, which usually resolves spontaneously without clinical consequences. In pediatric populations, Custodiol has been shown to reduce the seizure threshold, whereas, in adults, data are less clear although the pro-epileptogenic mechanism of hyponatremia likely applies across age groups.

In this context, the proposed mechanism of neuronal injury is not related to changes in osmolarity but rather to hyponatremia itself, which leads to cellular edema and the release of organic osmolytes such as glutamate. Under normal conditions, extracellular glutamate is maintained at low concentrations by sodium-dependent transporters such as GLT-1 and GLAST. When extracellular glutamate levels increase, excessive activation of its receptors occurs at the synaptic level, leading to excitotoxicity. This results in increased intracellular Ca^{2+} , which accumulates in mitochondria and contributes to the formation of reactive oxygen species. The final effect is increased oxidative stress, ultimately triggering apoptotic pathways.

Conclusions: This clinical case raises important considerations regarding adequate neuroprotection during cardiac surgery—an extremely complex field that remains not yet fully understood.

A08. Fulminant myocarditis, multimodal ventricular unloading in patient with ECPELLA: a case report

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We report the case of 28-year-old Caucasian male with recurrent acute myocarditis, presenting with a third episode in the last year. The current episode was marked by a rapid clinical worsening, progressing to fulminant myocarditis with severe left ventricular systolic dysfunction and hemodynamic compromise, requiring inotropic and mechanical circulatory support.

Mechanical circulatory support with IMPELLA CP device was initiated with profit, but hemodynamical invasive monitoring revealed elevated filling pressure, reduce cardiac output and increased systemic vascular resistance. Despite inotropic and vasodilator therapy, a further clinical deterioration prompted the implantation of femoro-femoral V-A ECMO and initiation of an ECPELLA strategy.

Administration of Levosimendan led to a partial recovery of left ventricular systolic function. Persistent hypertension and elevated left ventricular end diastolic pressure were successfully treated with Clevedipina infusion, resulting in a marked improvement of intracardiac hemodynamic. Furthermore, a clear enhancement in the performance of mechanical support was observed, in particular of IMPELLA, highlighted by the console smart assist program.

The patient was weaned from both MCS on day 10, with partial recovery of LVEF and transferred to a cardiac transplant center.

In our challenging case IMPELLA 5.0 smart assist was fundamental to monitoring intracardiac hemodynamics, LV function recovery, moreover it allows us to tailor pharmacological therapy. Clevedipina has played a key role in the management of hypertension given its specific pharmacodynamic profile, acting on arterial vascular resistance without altering preload and venous tone.

A09. Non-general anaesthesia versus general anaesthesia for endovascular aneurysm repair: a systematic review and meta-analysis

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Aim of investigation: Our aim was to compare the safety and effectiveness of non-general anaesthesia (non-GA; local, regional, neuraxial, or peripheral nerve block techniques) versus general anaesthesia (GA) for endovascular abdominal aortic aneurysm repair (EVAR).

Methods: We performed a systematic review and meta-analysis of comparative observational studies available in PubMed, Ovid MEDLINE, Scopus, and Embase and published from 2015 to 2025. The protocol was registered to the Prospective Register of Systematic Reviews (ID = CRD420251166433). Primary outcomes were 30-day mortality and in-hospital mortality. Secondary outcomes included hospital and intensive care unit (ICU) length of stay (LOS) and postoperative complications. Random-effects metaanalyses were performed using Paule-Mandel estimators with Hartung-Knapp adjustment. Heterogeneity, prediction intervals, and influence diagnostics were assessed.

Results: Twenty-two studies comprising more than 150,000 EVAR procedures were included. In the primary analysis, Non-GA was associated with no statistically significant difference in 30-day mortality compared with GA (risk ratio (RR) 0.90; 95% confidence interval (CI) (0.54–1.52), with substantial heterogeneity (Fig. 1). Influence analysis identified one outlying study; its exclusion resulted in significant mortality reduction favouring Non-GA (RR 0.72; 95% CI 0.59–0.87) with minimal residual heterogeneity (Fig. 2). Non-GA was associated with a shorter hospital LOS (mean difference –0.53 days) and similar ICU stay. For cardiac, pulmonary, renal, vascular, wound, and septic complications, pooled estimates were close to unity with substantial heterogeneity.

Conclusions: Non-general anaesthesia for EVAR appears safe and is not associated with increased short-term mortality. While a modest reduction in hospital length of stay was observed, effects on postoperative complications were heterogeneous and uncertain. Sensitivity analyses suggest a potential mortality benefit driven by study-level characteristics. These findings support the selective use of Non-GA in appropriately chosen EVAR patients and experienced centres.

Funding: This research received no external funding.

Conflict of interest: The authors declare no conflict of interest relevant to this article.

Outcome	Studies (k)	Effect (PM/HK, 95% CI)	I ²	95% Prediction Interval	Certainty of effect
30-day mortality	15	RR 0.90 (0.54–1.52)	86%	0.20–4.18	Very uncertain
30-day mortality (sensitivity*)	14	RR 0.72 (0.59–0.87)	1%	0.59–0.88	Favouring Non-GA
Hospital LOS (days)	10	MD –0.53 (–1.02 to –0.03)	79%	–1.73 to 0.68	Small reduction
ICU stay (days)	5	MD ≈ 0.00	0%	–	No difference
Renal failure	12	RR ≈ 1.0	>90%	Wide	Very uncertain
Cardiac complications	13	RR ≈ 1.0	>90%	Wide	Very uncertain
Pulmonary complications	13	RR ≈ 1.0	>90%	Wide	Very uncertain
Vascular complications	6	RR ≈ 1.0	>90%	Wide	Very uncertain
Wound infection	6	RR ≈ 1.0	Variable	Wide	Very uncertain
Sepsis	2	RR ≈ 1.0	High	Wide	Very uncertain

Fig. 1. Main Outcomes.

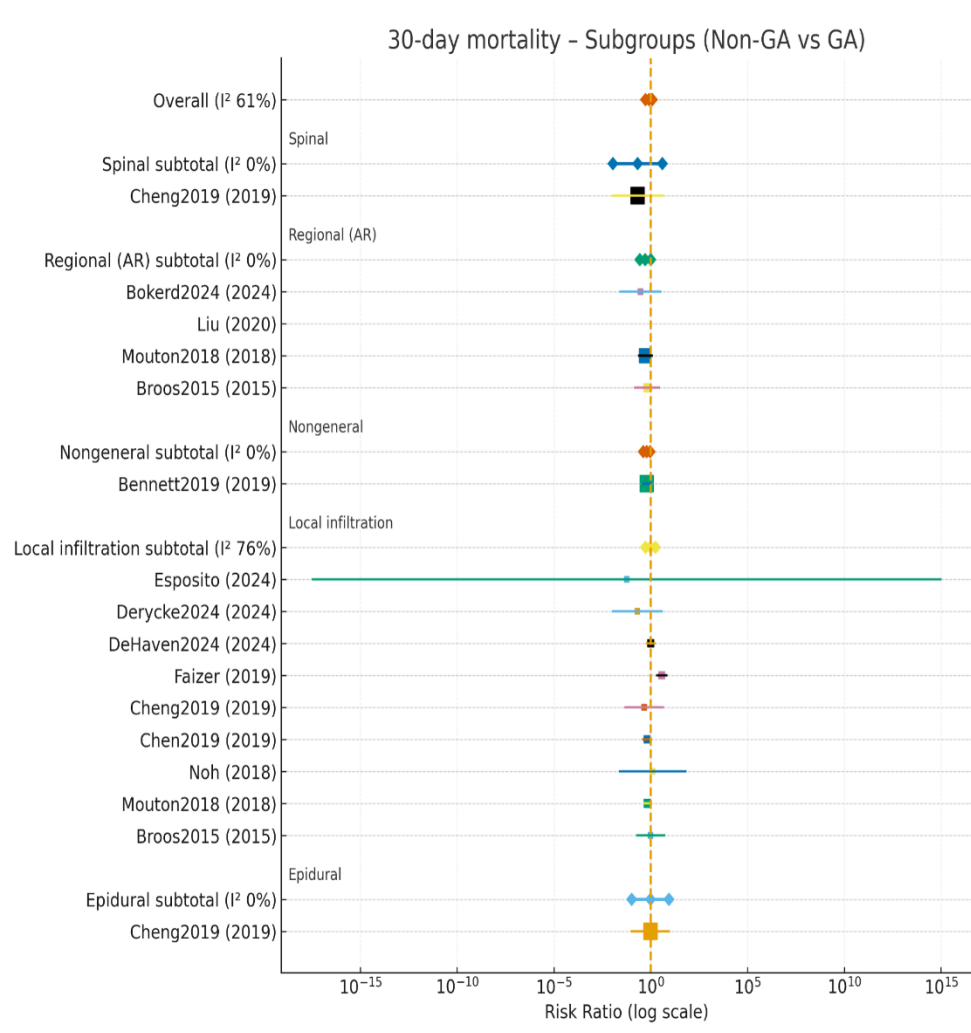


Fig. 2. 30-day subgroup Mortality.

A10. Normothermic regional perfusion in controlled donation after circulatory death (cDCD): a single-center comparison of outcomes and organ yield versus donation after brain death (DBD)

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Aim of investigation: Controlled Donation after Circulatory Death (cDCD) supported by Normothermic Regional Perfusion (nRP) is a key strategy to expand donor pools. We evaluated cDCD efficacy against Donation after Brain Death (DBD) in a tertiary Italian center to assess the feasibility of extending this model via a Mobile ECMO Team.

Methods: We conducted a single-center, retrospective study at Ospedale di Circolo—ASST Sette Laghi (Varese, Italy) involving all donors from Jan 2022 to May 2025, stratified into cDCD (nRP-supported) and DBD groups. The primary endpoint was functional graft recovery (30 days). Secondary endpoints included organ yield, donor demographics, trends, and non-eligibility. Statistical analysis was performed using R ($p < 0.05$).

Results: Of 87 donors, 33 were cDCD and 54 DBD. cDCD activity increased from 4 donors (2022) to 15 (2024). Functional graft recovery was comparable: 93.5% cDCD (58/62 organs) vs. 91.8% DBD (157/171; $p = 0.872$), with no difference for kidneys ($p = 0.39$) or livers ($p = 0.67$). Mean organ yield was higher in DBD (3.41 ± 1.43 vs. 2.42 ± 1.20 ; $p = 0.0032$) due to initial lower thoracic/pancreas retrieval in cDCD. Females were predominantly DBD (80.6%). Donor age showed weak correlation with yield ($R^2 = 0.076$), proving not limiting. Non-eligible donors were comparable (6 cDCD vs. 5 DBD).

Conclusion: cDCD with nRP proved safe, with functional recovery non-inferior to DBD. Despite lower per-donor yield and male predominance in the cDCD cohort, the program significantly boosts the donor pool. Age and eligibility rates

were similar between groups. These results support the implementation of a Mobile ECMO Team to extend nRP capabilities to peripheral hospitals, maximizing territorial donation potential.

Funding: None.

Conflict of interest: None declared.

A11. Safety and feasibility of atrial fibrillation pulsed field ablation under general anesthesia: a single center experience

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Introduction: Atrial fibrillation (AF) represents the most prevalent arrhythmia in clinical practice, posing a significant global health burden. The progression of the disease is driven by atrial remodeling, a process that facilitates the transition from paroxysmal to persistent AF by increasing the frequency and chronicity of episodes [1]. Such persistence is clinically concerning, as it is closely linked to heightened risks of cardiomyopathy, heart failure, ischemic stroke, and overall mortality. Consequently, timely intervention through early rhythm control has proven efficacy in mitigating long-term adverse cardiovascular outcomes [2]. For decades, clinical guidelines have positioned antiarrhythmic drug (AAD) therapy as the primary strategy for maintaining sinus rhythm in symptomatic patients [3]. However, contemporary clinical trials have consistently demonstrated that catheter-based ablation is not only highly effective but often superior to pharmacological management in achieving long-term rhythm control. While thermal modalities—specifically radiofrequency ablation (RFA) and cryoballoon ablation—have long served as the gold standard for achieving pulmonary vein isolation (PVI), they rely on extreme temperature gradients that lack tissue specificity, carrying the risk to cause complications such as thermal esophageal injury, life-threatening formation of atrio-esophageal fistulas, pulmonary vein stenosis, and phrenic nerve paralysis [4]. Pulsed field ablation (PFA) is a novel, non-thermal ablation modality for atrial fibrillation (AF) that relies on irreversible electroporation (IRE) to induce selective myocardial cell death [5, 6].

Although PFA is associated with shorter procedural times compared with conventional thermal ablation, delivery of high-voltage electrical pulses triggers intense skeletal muscle contractions, often resulting in pain and involuntary movement, thereby making general anesthesia (GA) a critical component of procedural success [7].

Effective anesthetic management during PFA must ensure adequate hypnotic depth, complete patient immobility, controlled ventilation, and stable hemodynamic conditions during energy delivery and catheter manipulation [8].

The purpose of this study was to assess the feasibility GA for PFA procedures.

Methods: Study population: Patients who underwent catheter ablation using PFA for AF at Cardiology Unit of Policlinico G. Rodolico (Catania), between January 2025 and December 2025 were analyzed. Inclusion criteria included ECG-documented AF prior to ablation and Class IA indication for AF catheter ablation. Procedure was performed on interrupted novel oral anticoagulation 1 day prior to intervention, and transesophageal echocardiogram (TEE) was routinely utilized for all cases to exclude left atrial appendage thrombus prior to transseptal puncture.

Anesthesia protocols: All procedures were performed, by an attending anaesthesiologist, under a standardized GA protocol tailored for PFA. Anaesthesia induction was achieved using intravenous propofol (induction dose 1.5–2.5 mg/dl, maintenance dose 4–12 mg/kg/h), followed by securing the airway via endotracheal intubation. For anaesthesia maintenance, inhaled sevoflurane (dose 1–3%) was administered. Intraoperative patient care included continuous standard physiological monitoring combined with goal-directed hemodynamic management to ensure optimal cardiovascular stability throughout the intervention.

Ablation protocol: The right femoral vein was cannulated percutaneously by the modified Seldinger technique at two sites (using one 7 and one 8 Fr introducer) under ultra-sound guidance. TEE was performed in every patient to guide the procedure. Coronary sinus cannulation with a decapolar diagnostic catheter was performed in each patient. A transseptal puncture was performed using a BRK™ Transseptal Needle (Abbott Medical, St. Paul, MN, USA). Heparin was administered to maintain an activated clotting time of 300 to 400 s. The PFA catheter (Farapulse, Boston Scientific, Marlborough, MA) was then introduced inside the left atrium. Fluoroscopy was used to optimize and confirm catheter contact prior to lesion delivery. PFA lesions were administered to achieve bidirectional block in all pulmonary veins and additional non-pulmonary vein ablation was not routinely performed.

At the conclusion of the procedure, protamine sulfate (10 mg) was administered if the activated clotting time was above 250 seconds, all sheaths were removed, and vascular closure was performed using a figure of eight suture and manual compression. Patients were observed for 24 h post-procedure and discharged the day after if all criteria for vascular and procedural recovery were met. Oral anticoagulation was resumed on post-procedural day 0.

Study endpoints: The primary endpoint of the study was the rate of airway and/or hemodynamic complications due to GA. Secondary endpoints included acute procedural success, total procedure time and time from GA induction to PVI

initiation, and periprocedural complications consisting of access site hematoma, pseudoaneurysm, lower extremity venous thrombosis, phrenic nerve paralysis, acute stroke, and pericardial effusion or tamponade. For each procedure, procedure time was defined as the period from the induction of GA until the removal of the sheaths at the end of the case.

Results: A total of 45 patients with paroxysmal or persistent AF (mean age 61.5 ± 8.5 years; 60% male) underwent PFA-PVI using the FARAPULSE™ system. The interval from induction of anaesthesia to initiation of PVI averaged 20.1 ± 7.7 minutes, indicating rapid anaesthetic preparation and efficient workflow integration. Mean total procedural duration was 72.8 ± 17.2 minutes, with a fluoroscopy time of 18.3 ± 7.4 minutes (Table 1). Throughout the procedures, adequate anaesthetic depth and immobility were consistently maintained, with no clinically significant hemodynamic instability observed. Importantly, no anaesthesia-related or acute peri-procedural complications (such as access site hematoma, pseudoaneurysm, lower extremity venous thrombosis, phrenic nerve paralysis, acute stroke, and pericardial effusion or tamponade) were recorded (Table 2).

Table 1. Procedural characteristics.

Number of patients with airway/hemodynamic complications	0
Rate of acute pulmonary vein isolation	100%
Total procedural time	72.8 ± 17.2 min
Time from induction of general anesthesia to initiation of pulmonary vein isolation	20.1 ± 7.7 min
Fluoroscopy time	18.3 ± 7.4 min

Table 2. Acute peri-procedural complications.

Number of access site hematoma	0
Number of pseudoaneurysm	0
Number of lower limbs thrombosis	0
Number of phrenic nerve paralysis	0
Number of acute stroke	0
Number of pericardial effusions	0
Number of cardiac tamponade	0

Conclusions: In conclusion, a standardized propofol- and sevoflurane-based GA strategy provides effective conditions for PFA procedures, ensuring patient comfort, procedural immobility, and cardiovascular stability. These findings support GA as a safe and efficient anaesthetic approach for PFA-guided PVI, facilitating seamless integration into high-volume electrophysiology workflows.

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A12. Efficacy of a robotic-AI system in a single-center observational study on microbiological surveillance in CTCCU

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Aim of investigation: To evaluate the impact of PRISMED's COPENICO Surveillance & Prevention robotic-AI system on microbiological colonization in a Cardiothoracic Critical Care Unit (CTCCU), comparing two patient groups in a 4-month pre–post intervention period.

Methods: This single-center observational study included all adult patients admitted to the CTCCU from December 2024 to March 2025. Group A consisted of patients admitted before the implementation of the robotic-AI system, while Group B included patients admitted after the intervention. Microbiological swabs were collected at predefined time points (T0: admission; T1: 1–10 days; T2: 11–20 days; T3: 21–30 days; T4: >31 days). In patients with positive swabs, the SOFA score was also evaluated.

Results: Baseline characteristics, comorbidities, device use, ICU procedures, discharge destination, and mortality did not differ between groups. Group A included 102 patients and Group B 91 patients. The proportion of positive swabs decreased from 15.03% in Group A to 9.89% in Group B. A significantly lower incidence of positive rectal ($p = 0.01$) and urinary ($p = 0.04$) swabs was observed in Group B. Across time points, Group B showed fewer positive swabs at T1, with an increasing trend at T2 and T3. In Group B, higher SOFA scores were associated with the presence of positive swabs.

Conclusion: The integration of an AI-enhanced robotic system appears to reduce rectal and urinary colonization rates in CTCCU patients. Larger prospective studies are required to confirm these findings and to assess the potential impact on the management of critically ill patients.

Funding: None declared.

Conflict of interest: The authors declare no conflicts of interest.

A13. Effects of cytokine adsorption with CytoSorb during extracorporeal circulation: reduction of inflammatory biomarkers and clinical impact

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Clinical Background: Cardiopulmonary bypass (CPB) is an essential component of modern cardiac surgery but is strongly associated with the development of a systemic inflammatory response syndrome (SIRS). Blood contact with artificial surfaces, complement activation, ischemia–reperfusion injury, and oxidative stress trigger a cytokine-mediated inflammatory cascade that may contribute to postoperative complications, including acute kidney injury, pulmonary dysfunction and hemodynamic instability. The use of CytoSorb device has been proposed to modulate inflammation and reduce the cytokine load during CPB, potentially improving hemodynamic stability and organ function in cardiac surgery patients.

Literature Overview: This narrative review aims to evaluate the role of extracorporeal cytokine adsorption using the CytoSorb device during CPB, focusing on its biological effects, clinical impact, and potential indications in cardiac surgery. Numerous clinical and experimental studies have analysed the integration of CytoSorb into the CPB circuit in adult patients subjected to elective or high-risk interventions. CytoSorb is a hemoadsorption device based on porous polymer beads capable of removing middle-molecular-weight inflammatory mediators, including interleukins (IL-6, IL-8), tumor necrosis factor- α , bilirubin, and myoglobin. Clinical evidence suggests that its efficacy is highly dependent on patient selection and inflammatory burden. For this reason, the results relating to the reduction of circulating levels of pro-inflammatory cytokines (e.g., IL-6, IL-8, TNF- α) and clinical outcomes are variable: some studies report significant reductions in specific cytokines and mild hemodynamic improvements, while others, including randomized clinical trials, show no significant differences in inflammatory biomarkers or main clinical endpoints.

Conclusions: The adsorption process, carried out by CytoSorb, is concentration-dependent and this may show more evident results in patients with high hyperinflammatory disease or in non-elective settings (e.g., infectious endocarditis or emergency surgery). CytoSorb represents a significant step towards an increasingly personalized cardiac surgery, however further large-scale, randomized studies are required to define optimal timing, patient selection, and clinical endpoints.

A14. The role of the perfusionist in the management of the CARMAT Aeson total artificial

heart: a clinical case

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Background: Advanced heart failure (HF) remains a major challenge in contemporary cardiac surgery, particularly in patients refractory to optimal medical therapy and temporarily ineligible for heart transplantation. Accordingly, Mechanical Circulatory Support (MCS) devices, including the Total Artificial Heart (TAH), have emerged as life-saving bridge-to-transplant (BTT) options, requiring highly specialized multidisciplinary management.

Case Description: We report the case of a 46-year-old patient with end-stage HF secondary to non-ischemic dilated cardiomyopathy, complicated by severe biventricular dysfunction, NYHA class IV symptoms, pulmonary hypertension, and severe mitral regurgitation, managed in another institution affiliated with our school of perfusion. The clinical course was characterized by progressive hemodynamic instability and refractoriness to conventional medical and surgical therapies. Following temporary stabilization with percutaneous ventricular support, the absence of viable long-term alternatives prompted implantation of the CARMAT TAH as a BTT strategy. The decision to proceed with TAH implantation was driven by the need for complete biventricular replacement to restore adequate systemic perfusion in a complex clinical scenario. The bioprosthetic pulsatile CARMAT, featuring autoregulatory capabilities, achieved effective circulatory stabilization while awaiting transplant eligibility.

The perfusionist played a pivotal role in the management of the CARMAT within the multidisciplinary care team. Responsibilities spanned the entire clinical pathway, including device preparation, intraoperative cardiopulmonary bypass management, TAH initiation, and postoperative monitoring. Key tasks involved hemodynamic optimization, real-time interpretation of device parameters, early detection of technical or physiological complications, and continuous collaboration with cardiac surgeons and anesthesiologists to tailor device settings to the patient's evolving clinical condition. This specialized expertise was essential to ensure patient safety and optimal device performance.

Conclusions: MCS devices represent a cornerstone in the treatment of advanced HF. Technological advances, careful patient selection, and expert multidisciplinary management, have transformed these systems from temporary life-sustaining measures into effective therapeutic strategies capable of restoring hemodynamic stability and quality of life.

A15. The role of SvO₂ during CPB on postoperative organ failure

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Aim of investigation: Since the advent of cardiac surgery, postoperative organ dysfunction continues to be a significant challenge, leading to complications such as AKI, pulmonary insufficiency, and in-hospital mortality. Although some studies have linked low intraoperative SvO₂ to poorer outcomes, the exact threshold levels have not yet been established.

Methods: Seventy-three patients scheduled for elective cardiac surgery participated in a prospective observational study. SvO₂ levels were recorded during cardiopulmonary bypass at three specific time points and analysed in relation to postoperative outcomes. These outcomes included AKI, the duration of mechanical ventilation within the first five days, and in-hospital mortality. This comprehensive data collection was designed to gain detailed insights into intraoperative and postoperative factors. Although the findings were not statistically significant, a notable trend indicated that SvO₂ levels above 85% at different times were associated with increased rates of AKI on days 2 and 3 and prolonged ventilation, suggesting potential clinical relevance.

Discussion: Contrary to the traditional paradigm that focuses on the risks of low SvO₂ and inadequate oxygen delivery, our results highlight a potentially under-recognised phenotype characterised by elevated SvO₂, possibly reflecting impaired oxygen extraction due to microcirculatory mitochondrial impairment, hyperinflammation or hypoxia.

Conclusion: Future large-scale, prospective investigations are warranted to define safe and effective intraoperative SvO₂ ranges across different surgical populations and perfusion strategies. Incorporating continuous SvO₂ monitoring with complementary assessments of oxygen delivery, extraction ratio (O₂ER), and microcirculatory perfusion could enable a more precise understanding of the dynamic interplay between oxygen transport and utilisation during CPB.

Funding: None.

Conflict of interest: The authors declare no conflict of interest.

A16. Acute postoperative bilateral parotitis (“post anesthesia mumps”) following cardiac surgery: a case report

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Background: Post anesthesia mumps is a rare complication after general anesthesia with an often multifactorial etiology described following non cardiac surgery, most frequently in Neurosurgery.

Aim of investigation: To describe a rare case of non-infectious bilateral post-anesthesia mumps occurring for the first time after cardiac surgery. The study also aims to highlight the importance of early ultrasound diagnosis in managing the upper airway to prevent post-extubation complications.

Clinical case: A 75-year-old man underwent aortic valve and ascending aorta replacement for ascending aortic aneurysm and moderate-severe aortic stenosis. The patient did not experience any significant intraoperative complications. In particular, no difficulties were encountered during endotracheal intubation, no massive blood loss occurred, and no issues were observed during weaning from cardiopulmonary bypass (CPB), which required only low doses of vasoactive agents. Few hours after surgery a symmetrical and hard swelling of the neck was observed; an ultrasound scan was performed revealing bilateral parotid enlargement with heterogeneous echo-texture and reactive laterocervical lymphnodes compatible with acute parotitis.

Discussion: The patient was treated with intravenous hydration, analgesics, with complete regression of symptoms in the following days without any sequelae. Possible risks factors for the development of this condition may include hypovolemia, moderate blood loss and vasopressors, that may have impacted salivary perfusion causing stasis and ductal inflammation, orotracheal intubation and mechanical ventilation; we also suggest that trans-oesophageal probe, routinely used in cardiac surgery, together with possible edema after CPB may have enhanced the odds of developing such condition. In elderly patients with type 2 diabetes (reduced basal salivary secretion) and hypertension, these elements could act synergically. Serological tests and cultures were negative for viral or bacterial pathogens.

Conclusions: This case highlights a rare non-infectious bilateral post-anesthesia mumps as a first case after cardiac surgery, probably related to dehydration and mechanical obstruction of the glandular excretory ducts by calculi, thickened secretions or position. It highlights the rarity of a post operative acute bilateral parotitis, emphasizes the importance of early ultrasound diagnosis in the management of upper airway to avoid post extubation complications and suggests perioperative hydration protocols.

Funding: None.

Conflict of interest: No conflict of interest to declare.

A17. Hemodynamic impact of red blood cell transfusion in neonates with cyanotic and acyanotic congenital heart disease: a PRAM-based analysis

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Background: Red blood cell (RBC) transfusion is commonly employed in neonates with congenital heart disease (CHD) to enhance systemic oxygen transport. However, transfusion strategies remain largely hemoglobin-driven, despite the complex and highly variable hemodynamic determinants of oxygen delivery in neonatal cardiac patients.

Methods: We conducted a pre-post observational study including neonates with cyanotic and non-cyanotic CHD admitted to the Cardiac Intensive Care Unit of Bambino Gesù Children's Hospital between July and December 2025. Hemodynamic and metabolic variables were collected immediately before RBC transfusion (T0) and one hour after its completion (T1). Continuous arterial waveform analysis using the PRAM was employed to assess beat-to-beat cardiac index and derived hemodynamic parameters. Oxygen transport was evaluated using indexed oxygen delivery (DO₂I) and central venous oxygen saturation (SvO₂), alongside arterial blood gas analysis, lactate levels, and thermal gradients.

Results: RBC transfusion was associated with a significant increase in DO₂I (median Δ DO₂I increase of 64 mL/min/m², $p < 0.001$) and SvO₂ (increase of 5.1%, $p = 0.028$), without significant changes in cardiac index or heart rate. Systolic, diastolic, and mean arterial pressures increased significantly (all $p < 0.01$), while central venous pressure showed a modest rise. No significant variations were observed in arterial lactate levels, pH, or thermal gradients. At baseline, neonates with cyanotic CHD exhibited higher cardiac index values than non-cyanotic patients; however, cyanotic status did not independently predict the magnitude of DO₂I response following transfusion, indicating substantial inter-individual variability.

Conclusions: In neonates with congenital heart disease, RBC transfusion leads to an early improvement in systemic oxygen delivery primarily through increased oxygen content rather than augmented cardiac output. These findings support a physiology-guided transfusion strategy integrating dynamic hemodynamic and oxygen transport markers beyond hemoglobin concentration alone.

A18. Anaphylactic shock from Praxbind in a cardiac surgery patient: case report

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Only one case of mild anaphylaxis to idarucizumab has been described in literature until now, in a stroke related 77-year-old woman case. To our knowledge, this is the first case during cardiac surgery. To prevent bleeding complications, several reversal agents have been developed to counteract direct oral anticoagulants. Idarucizumab is a monoclonal antibody, approved for the first time in the USA in 2015, suitable for use in adult patients treated with dabigatran when rapid reversal is required, for emergency surgery/urgent procedure in life-threatening or uncontrolled bleeding.

Informed consent for publication of anonymized clinical data was obtained from the patient's next of kin. The study was conducted in accordance with the Declaration of Helsinki.

In November 2025, a 66-year-old man was listed in our center for heart transplant due to dilatative cardiomyopathy. During surgery, he showed a severe anaphylactic reaction after idarucizumab administration, with need for emergent ECMO VA support, removed at the end of the procedure. After ICU admission, a new episode of refractory shock occurred, needing new ECMO VA support. Acute kidney damage was a complication, requiring Cytosorb hemoabsorption as immunomodulant treatment along with plasmapheresis. Unfortunately, severe cerebral damage occurred, leading to patient cerebral death.

Severe anaphylaxis has been never detected after idarucizumab administration. Prolonged hypotension, refractory to ECMO and vasoactive drugs infusion, impaired global clinical condition of a heart-transplant patient. A multi-organ failure setting led to a poor prognosis and cerebral death. Further studies are necessary in order to detect potential severe adverse effects to reverse agents of DOAC. Cardiac surgery is still poorly-investigated field.

Funding: No funding received.

Conflict of interest: None.