OP01 PRELIMINARY INSIGHTS FROM THE INTERHEART STUDY: PROSPECTIVE VALIDATION AND CLINICAL CORRELATES OF THE MOLECULAR MICROSCOPE DIAGNOSTIC SYSTEM IN HEART TRANSPLANT BIOPSIES

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The current standard diagnose of acute cellular rejection (ACR) and antibody-mediated rejection (AMR) in heart transplantation is based on immunopathological analysis of endomyocardial biopsies (EMB) graded according to morphological classifications defined by expert consensus. Morphological grading is however limited by reproducibility issues across centers and uncertain clinical correlations. By analyzed banked samples, we recently found that a molecular-based approach developed on kidney transplant biopsies (Molecular Microscope Diagnostic System (MMDx)) may provide accurate disease classification also in EMB, potentially improving the diagnostic ability of standard pathology. Herein we report preliminary data of prospectively collected EMBs classified according with the MMDx system. Twenty-three EMBs from 21 patients, collected according with clinical practice, were graded according to standard pathology criteria and analyzed by MMDx classifiers. Patients also underwent right heart catheterization and cardiac ultrasound. Based on the gene-expression environments developed with the previous retrospective study, MMDx classified current prospective biopsies as normal in 13 (56%) of cases, AMR in 5 (22%) and normal with borderline AMR activity in 5 (22%). EMBs graded as normal and pAMR2 by histology were highly consistent with MMDx classifications. Pure ACR readings and pAMR1 grades showed weaker concordance with MMDx. In particular, 1B and 3A grades consistently activated injury-repair, antigen presenting cells, and chemokine ligands transcripts, while 1A and 2 graded biopsies were reclassified as normal by MMDx. When matched with graft function parameters, MMDx-defined AMR was significantly associated with high right atrial and pulmonary wedge pressure, while pathology-graded AMR or ACR were not. This preliminary analysis of the MMDx system to EMB further supports the concept that rejection associated transcripts are commonly shared across different organs (kidney and heart), in particular for AMR. The weak association between histology and molecular ACR environment may reflect both the limitations of current ACR grading system, and the need to further refine the molecular classifications for heart ACR. Most importantly, the correlation between MMDx with parameters of graft function suggests that molecular-based approach may overall improve the diagnosis of rejection, and provide insights to improve the pathological grading of EMBs.

OP02 A NEW PRE-TRANSPLANT HUMORAL IMMUNITY SCALE TO DETECT SEVERE INFECTION RISK IN HEART RECIPIENTS. RESULTS OF A MULTICENTER STUDY

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Introduction: Severe infection remains as a major problem after heart transplantation. We aimed to assess an scale combining humoral immunity biomarkers to be performed before transplantation as a potential tool to identify high risk of severe infection.
Methods: A prospective multicenter follow-up study (8 centers in Spain). We evaluated 290 patients at the time of inclusion in the waiting list. Laboratory tests: immunoglobulin levels (IgG, IgA, IgM), complement factors (C3 and C4) and IgG anti-CMV serology. These biomarkers are easily available in the routine laboratory facilities in transplant centers. The prevalence of infection during the first 6 months was registered. Infections were defined as severe infections requiring IV-antimicrobial therapy. Catheter-related infections and superficial surgical infections were not included as events.
Results: During follow-up, 96 patients developed infections including severe bacterial infections, CMV disease or systemic fungal infections. The individual risk factors of overall infection (Logistic regression) were as follows: Serum IgG < 850 mg/dl (relative hazard [RH], 1.88; 95% confidence interval [CI], 1.04–3.41; $P = 0.01$), C3 < 110 mg/dl (RH, 2.68; 95% CI, 1.46–4.92; $P = 0.0014$) and negative IgG anti-CMV serology (RH, 2.75; 95% CI, 1.28–5.91; $P = 0.0093$). An immunological scale was created using hazard ratios to determine the number of points assigned to each of the individual risk factors and the sum was the score. In multivariate analysis an immunological score ≥3 was stronger as a risk factor of severe infections (RH, 5.61; 95% CI, 2.41–13.06; $P = 0.0001$); specificity 94%. After adjustment by clinical risk factors a high score remained as a significant risk factor for infection. Patients with a high immunological score (≥3 points) were found to have significantly lower levels of IgG, C3 and of anti-pneumococcal antibodies [IgG, IgA and IgM] at 1 month after transplantation.
Conclusion: A pre transplant immunological scale combining IgG, C3 and CMV serology was useful for identifying heart recipients at risk of developing severe infections. Patients with a higher score are candidates for a more careful surveillance. Lower levels of immunological parameters, even within normal ranges, are associated with a greater risk of having infections when patients are exposed to a critical multifactorial immunosuppressive stress, such as after transplant.

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OP03 PRE-TRANSPLANT HUMORAL IMMUNITY RISK FACTORS OF INFECTION IN LUNG TRANSPLANTATION: RESULTS OF A MULTICENTER STUDY

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Hypogammaglobulinemia and hypocomplementemia have been described as risk factors for development of severe infection in single center studies performed in distinct solid organ transplantations. Evaluation of biomarkers should be performed in multicenter studies before introduction of the biomarkers in clinical practice. We here present results of a multicenter study in lung transplantation to define the prevalence of pre-transplant humoral immunity risk factors of infection. A prospective follow-up study was performed between February 2010 to June 2015 in 5 transplant centers in Spain (Madrid – Barcelone – Santander – Valencia). A total of 163 patients were assessed at the time of evaluation for Lung Transplantation. IgG, IgA, IgM, complement C3 and C4 concentrations (nephelometry) were assessed in serum samples obtained before transplantation. All centers submitted serum samples to a coordinating laboratory in Madrid. We used common definitions of humoral immunity risk factors evaluated in distinct immunodeficiency settings: Hypogammaglobulinemia IgG < 600 mg/dl; severe hypogammaglobulinemia IgG < 400 mg/dl; hypogammaglobulinemia IgA < 80 mg/dl, hypogammaglobulinemia IgM < 50 mg/dl; hypocomplementemia C3 < 80 mg/dl and hypocomplementemia C4 < 20 mg/dl. To assess the agreement between laboratories (inter-laboratory reproducibility of IgG, C3 and C4), we used 37 samples that were tested in 3 participant local laboratory centers. These serum samples were obtained at the same time than those submitted to the coordinating laboratory. Mean and range of the pre-transplant biomarkers were as follows: IgG 1265, 214–4380 mg/dl; IgA 340, 47.3–1280 mg/dl; IgM 155, 38–414 mg/dl; C3 163, 64.7–314 mg/dl; C4 39, 6.7–274 mg/dl. The prevalence of immunological abnormalities in the pre-transplant period was as follows: Hypogammaglobulinemia IgG: 5.1%; severe IgG hypogammaglobulinemia: 1.3%; IgA hypogammaglobulinemia: 1.3%; selective IgA deficiency (IgA < 7 mg/dl with normal IgG and IgM concentration) 0%; IgM hypogammaglobulinemia: 9.2%; C3 hypocomplementemia: 0.7%; C4 hypocomplementemia: 8.3%. Linear regression results of the inter-laboratory analysis were as follows: IgG, R 0.77, $P < 0.001$; C3, R 0.54, $P = 0.01$; C4 R 0.76, $P < 0.001$. In conclusion, in a multicenter study, we defined the prevalence of distinct potential humoral immunity risk factors of infection in lung recipients. It should be taken into account that even before transplantation a subset of patients disclose distinct abnormalities which are probably related to underlying terminal lung diseases.

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OP04 QUANTIFERON MONITOR: A NOVEL IMMUNE MONITORING ASSAY TO STRATIFY RISK OF INFECTION AFTER HEART TRANSPLANTATION

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Objective: The optimal balance between adequate protection from rejection and the adverse consequences of over-immunosuppression is an important unmet need in clinical practice after heart transplant (HT). We tested the clinical applicability of Quantiferon monitoring (QFM), a novel immune monitoring test developed to detect conditions of over- or under-immunosuppression after solid organ transplantation, focusing our analysis on infectious risk.
Methods: QFM was performed at study entry and then 3 to 6 months later in 98 consecutive HT recipients. The test consists in plasma interferon-gamma (IFN-g) assay by the Quantiferon ELISA platform, after overnight incubation of 1 ml of whole blood with lyophilized antigens that stimulate NK-cells, with a TLR-7 agonist, and CD3 T lymphocytes with a TCR agonist. QFM results are reported as median [25th–75th percentile] and 3 to 6 month infection occurrence was the study endpoint.
Results: Of the 98 enrolled patients (58 $\pm$ 14 y old, 30% females, with 60 $\pm$ 10% ejection fraction, with a median time from transplant of 4.7 years after HT), 28 (28%) experienced an infectious episode during study period. QFM showed a wide variability, with a median value of 106[27–327] IU/ml of IFN-g. Patients developing infections had IFN-g concentrations significantly lower than those without infections (34[12–83] vs.174 [66–543] IU/ml; $P < 0.01$). Patients with relapsing infections showed further lower IFN-g values when compared with those with recovering or de novo infections ($P = 0.05$). When tested after infection, QFM markedly increased, while remained stable in non-infected patients ($P < 0.01$). ROC analysis identified a cut-off of 85 IU/ml to discriminate the subgroup at higher risk of infection: 51% of patients with QFM < 100 developed infections vs. 11% of those with QFN $\geq$100 IU/ml ($P < 0.01$). The ability of QFM to discriminate infection persisted even after adjusting for possible confounders such as time from transplant.
Conclusion: This study provides first suggestive evidence that a novel immune-monitoring method of IFN-g assay after stimulation of innate and adaptive immunity may identify HT recipients with low responsiveness of immune system and high risk of infection. Further analysis is needed to assess the effect of therapy modulation on QFN and the relationship with acute rejection episodes.

OP05 THE PRESERVATION TECHNIQUE MODULATES THE IMMUNOLOGICAL MILIEU IN LUNG TRANSPLANTATION AND EFFECTS THE PRO-/ ANTI-INFLAMMATORY BALANCE

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Background: Very little is known regarding the influence of different preservation techniques (i.e. cold static storage with Perfadex® or Celsior® solution) on the immunological milieu, especially lung-resident lymphocyte subsets and the cytokine /chemokine milieu in lung transplantation. Both NK and T cells, depending on their cell surface receptor repertoire and their cytolytic function, can have pro- and anti-inflammatory effects and, hence, can promote a tolerogenic or immunogenic environment. We aimed to identify how the preservation technique may alter the immunological milieu and if these changes correlate with the clinical outcome. Therefore, we investigated the pulmonary and peripheral lymphocyte repertoire and assessed the in vitro migratory capacity of lymphocyte subsets depending on the different perfusion solutions in clinical lung transplantation.
Methods: Lymphocytes from peripheral blood (PBMC) and perfusion solution from 42 lung transplant recipients, Perfadex ($n = 19$) and Celsior ($n = 23$), were isolated by density centrifugation. T- and NK cell subsets were analyzed by FACS. Cell migration assays were performed with the perfusion solutions, incubated with PBMC for 4 hours and quantified by FACS.
Results: The pulmonary compartment is associated with significant changes in lymphocyte composition and surface receptor expression compared to PBMC. Lymphocytes in Celsior solutions contained significantly more CD8+ T cells ($P < 0.023$) and less CD4+ T cells which translates to an altered CD4/CD8 ratio ($P < 0.045$), discriminating it from Perfadex solution. These findings correlate with an increased CD8+ and reversely, decreased CD4+ T cell repertoire of Celsior recipient PBMC directly post-op ($P < 0.0042$). Post-op T cell subsets were also significantly different between these perfusion solutions ($P < 0.0413$). Remarkably, Celsior solution shows also in vitro an increased migratory effect on T cells compared to medium and Perfadex solutions ($P < 0.0038$).
Conclusion: The significant differences between pulmonary and peripheral lymphocytes indicate that the choice of the perfusion solution may have an impact on the immunological milieu through distinct cell migratory capacities, recruiting specific lymphocytes subsets. This effect could alter the pulmonary immunological environment and may, therefore, influence the tolerance-rejection balance.

OP06 C3D BINDING DONOR SPECIFIC ANTIBODIES ARE ASSOCIATED WITH HUMORAL REJECTION AND GRAFT LOSS

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Rational: It has been demonstrated in heart and kidney transplant that DSA mediates damage to the allograft via multiple mechanisms, including complement-dependent and independent actions. The transplant community is now in pursuit of new tools or technologies that will allow for stratification of DSA+ patients for antibody mediated rejection (AMR). C3d assay allow direct measure of DSA activation of complement.
Method: According to routine DSA detection strategy (Single Antigen One Lambda), 105 patients within our Foch Lung transplant cohort (sept 2008-dec 2013) were considered as DSA positive patients and further tested using the Immucor® LSA Lifecodes bead-based assays for single antigen and C3d testing. AMR diagnosis associated graft failure and DSA presence and histological lesion compatible with AMR and/or C4d positive staining. DSA positivity was defined by BCM > 500 (Background corrected MFI). C3d ratio was calculated as C3d BCM of patients beads/C3d BCM of negative control.
Results: Among 105 patients, 25 were considered DSA + AMR- and 15 DSA + AMR+. Comparison of donor specific beads BCM and donor specific beads C3d ratio between DSA + AMR+ and DSA + AMR- patients show a significantly higher value in DSA + AMR+ patients. BCM and C3d ratio of donor specific beads show strong correlation in DSA + AMR+ patients (R = 0.6). Within DSA + AMR- group the correlation was weaker (R = 0.09). Within our study population, immunodominant DSA C3d ratio > 4 was significantly associated with graft loss.
Conclusion : DSA capacity to bind C3d is clearly associated with AMR and graft loss in Lung Transplantation. These results need to be validated in larger multicentric and prospective study.

OP07 ANTI-INFLAMMATORY EFFECT OF MULTIPOTENT ADULT PROGENITOR CELL ADMINISTRATION DURING EX VIVO LUNG PERFUSION

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Introduction: Primary graft dysfunction is considered to be the end result of a big inflammatory response targeting the new allograft secondary to organ transplantation. Multipotent adult progenitor cells (MAPC) might attenuate this injury by its paracrine effects on the pro-/anti-inflammatory balance. Ex-vivo lung perfusion (EVLP) serves as the ideal platform for MAPC-administration and evaluation of the treatment effect on the pulmonary graft.
Methods: Domestic pigs were divided in 2 groups ($n = 6$/group). Lungs were subjected to 90 minutes of warm ischemia prior to the cold flush. Lungs were then cannulated on ice and placed on EVLP for 6 hours. At the start of EVLP, 40 ml of an albumin-plasmalyte mixture was instilled in the airways through bronchoscopy (CONTR-group). In the MAPC-group, 150 million MAPC's (MultiStem®, ReGenesys) were included in this mixture. At the end of EVLP, a physiological evaluation (pulmonary vascular resistance, lung compliance, PaO2/FiO2), wet-to-dry weight (W/D) sampling and a broncho-alveolar lavage (BAL) (2 $\times$ 30 ml) was performed. Data at the end of EVLP was compared with a Mann Whitney test.
Results: Pulmonary vascular resistance, lung compliance and PaO2/FiO2 were not statistically different at the end of EVLP between both groups. Also, there was no statistical significant difference in W/D (estimation of lung edema). Multiplex-analysis of the BAL fluid at the end of EVLP did show a significant difference in TNF-alpha, IL-1B and IFN-gamma. There was no difference in IFN-alpha; IL-4, IL-10 and IL-8 were below the detection limit.
Conclusion: Although no physiologic effect of immunomodulation was detected during EVLP, we did observe a reduction in pro-inflammatory cytokines in the BAL of the MAPC group compared to the CONTR group. This effect might play an important role in critically modifying the process of ischemia-reperfusion injury after transplantation. Since the lungs were not challenged with a pulsatile flow of whole blood, the effect of immunomodulation

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on this reperfusion injury might have been missed. Further experiments will have to elucidate the effect of MAPC-administration on graft function after transplantation.

OP08 TECHNIQUE FOR EX VIVO LUNG PERFUSION (EVLP) OF LUNGS FROM BRAIN-DEAD DONOR RATS AND THE EFFECT OF PREDNISOLONE

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Ex vivo lung perfusion (EVLP) has become a clinically important tool to treat marginal donor lungs suffering from edema. Prednisolone is used in donor management and therefore routinely added during EVLP. In the experimental setting, prednisolone has been described to enable prolonged ex vivo perfusion of pre-injured lungs. Mechanism of action has not been described, but might be the result of reduced edema and modulation of the immune response. Here, a newly established ex vivo lung perfusion model and effect of prednisolone in the EVLP were investigated. Heart-lung blocks were procured from Lewis rats 3 hrs after acute brain death induction and were cold preserved for 1 h in Perfadex. Thereafter, lungs were placed for 6 hrs in the normothermic EVLP model. Lungs were ventilated with a tidal volume of 7 ml/kg of body weight, a PEEP of 5 cmH2O, a frequency of 60 and a FiO2 of 21%. Perfusion was performed with a modified Steen solution, cefuroxime with and without 40 mg prednisolone at a maximal pulmonary arterial pressure of 12 mmHg. Ventilation parameters, lung oxygenation capacity, glucose levels, lactate and flow were noted and perfusate samples collected, over time. Lungs were macroscopically scored and analyzed for wet/dry ratio, qPCR and patho-histological changes. Ventilation parameters, lung oxygenation capacity and flow indicate that we have established a stable EVLP system, with a beneficial effect of prednisolone in EVLP. Flow and lung oxygenation capacity were comparable over time between healthy lungs and pre-injured lungs treated with prednisolone during EVLP. Positive Inspiratory Pressure (PIP) was significantly worse in BD lungs compared to BD lungs treated with prednisolone (25.6 $\pm$ 5.8 vs 18.2 $\pm$ 3.3, at 6 hours of reperfusion), possibly as a result of reduced pulmonary edema (W/D ratio 6.3 $\pm$ 0.4 vs 5.4 $\pm$ 0.3). Prednisolone acted anti-inflammatory by significantly reducing IL-1β ($P = 0.016$) and MCP-1 ($P = 0.016$) production, suggesting that the effect of prednisolone is mainly focused on macrophages.

OP09 CT-IMAGING OF REJECTED HUMAN DONOR LUNGS BEFORE AND AFTER EX VIVO LUNG PERFUSION

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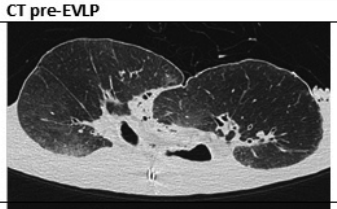
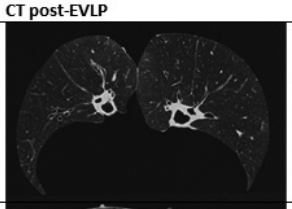
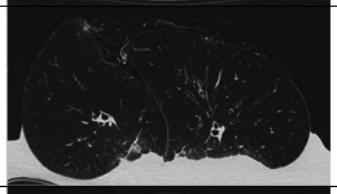
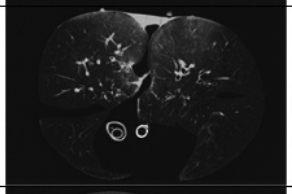
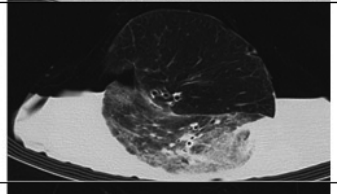
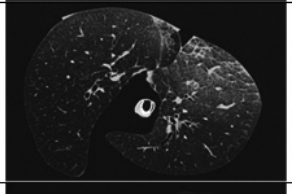
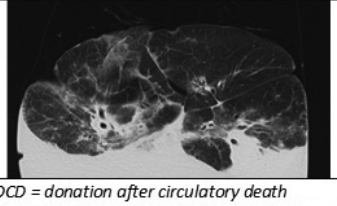
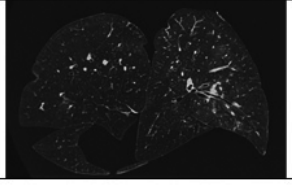
Introduction: Approximately 75% of lung offers are currently not accepted for transplantation. Ex-vivo lung perfusion (EVLP) may be a valuable tool to increase the donor lung acceptance rate since EVLP allows for careful evaluation and possibly reconditioning of lungs that seem unsuitable for lung transplantation. However, besides physiological data, not much is known about the effect of EVLP on the lung parenchyma. Imaging before and after EVLP, could add valuable information to decide on transplantability.
Methods: Starting from January 2016, donor lungs declined for transplantation on site were transported semi-inflated on OCS solution (Transmedics) in ice to our laboratory for evaluation with EVLP (ethical committee approval NH019 2015-10-S58330). Donor data and physiological data during EVLP are recorded. All recovered human lungs (RHL, $n = 4$) lungs underwent a CT-scan before (on ice) and at the end of EVLP (frozen inflated at 30 cmH2O).
Results: RHL1 was declined due to increased pulmonary pressures and edematous lower lobes detected during in situ donor evaluation. During EVLP, we did not detect any sign of increased pulmonary pressures (Ppeak) or vascular resistance (PVR) and CT shows a reduction in edema after EVLP. RHL2 was declined for logistical reasons since there was no OR available at the time (otherwise qualitatively good donor lung). Lungs could potentially be preserved on EVLP until an OR became available. RHL3 was declined due to bad arterial blood gases with consolidation and atelectasis in the left lower lobe. EVLP resulted in recruitment of the lungs and a decrease in infiltrates on CT scan. RHL4 was rejected based on bad arterial blood gases with parenchymal infiltrates shown on CT scan. EVLP showed a stable physiological evaluation and CT post EVLP showed a reduction in parenchymal infiltration.
Conclusion: CT-scanning might be a useful tool to assess the transplantability and improvement in donor lung quality after EVLP. This case series shows that transplantation of rejected extended criteria donor lungs is feasible after EVLP evaluation and reconditioning. Therefore, EVLP could lead to higher acceptance rate of donor organs and lower waiting list mortality.

Nr°	Reason Decline	CT pre-EVLP	CT post-EVLP	EVLP
RHL1 36 y Male DBD (Intra-Cerebral Bleeding)	Increased pulmonary pressures + Edema lower lobes			**EVLP Time: 4 hrs** **PaO_2/FiO_2: 610 → 614** **PVR: 279 → 302 (dynes*sec*cm^{-5})** **Ppeak: 20 → 18 (cmH_2O)**
RHL2 70 y Male DCD (Trauma Capitis)	Logistical reason (no OR available)			**EVLP Time: 2 hrs** **PaO_2/FiO_2: 600 → 657** **PVR: 222 → 248 (dynes*sec*cm^{-5})** **Ppeak: 9 → 17 (cmH_2O)**
RHL3 78 Female DBD (Intra-Cerebral Bleeding)	PaO_2 210 mmHg (100% F_iO_2) Atelectasis + Infiltrates lower lobes			**EVLP Time: 2.5 hrs** **PaO_2/FiO_2: 595 → 648** **PVR: 308 → 279 (dynes*sec*cm^{-5})** **Ppeak: 12 → 12 (cmH_2O)**
RHL4 33 y Male DBD (Sub-arachnoidal bleeding)	PaO_2 113 mmHg (100% F_iO_2) Parenchymal infiltrates			**EVLP Time: 2 hrs** **PaO_2/FiO_2: 586 → 505** **PVR: 404 → 348 (dynes*sec*cm^{-5})** **Ppeak: 10 → 10 (cmH_2O)**

DBD = donation after brain death; DCD = donation after circulatory death
EVLP parameters are depicted as: First value after rewarming (1 hr) → Final value at the end of EVLP

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OP10 KL-6 IS A POTENTIAL BIOMARKER TO DIFFERENTIATE CHRONIC ALLOGRAFT DYSFUNCTION PHENOTYPES IN LUNG TRANSPLANTATION. PRELIMINARY RESULTS

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Introduction: Chronic allograft dysfunction (CLAD) is the main limitation for Lung Transplantation (LT) survival. Two phenotypes of CLAD had been defined: Bronchiolitis Obliterans Syndrome (BOS) and Restrictive Allograft Syndrome (RAS). We hypothesize that levels of the glycoprotein KL-6 in bronchoalveolar lavage fluid (BALF) or serum in LT population may differ between phenotypes. Thus, the objective of the study was to analyze KL-6 levels in BALF and in serum samples from LT patients in different situations: stable (ST), infection (LTI), BOS and RAS.
Patients and methods: Forty four patients with bilateral LT and who survived more than 3 months were included. The population was divided in 4 groups: 14 ST patients, 10 LTI patients, 12 BOS patients and 8 patients with RAS. BALF and serum samples from the 44 patients were analyzed with the ELISA kit for KL-6 (Eidia Co. Ltd., Tokyo, Japan).
Results: KL-6 levels in serum were higher in RAS patients being of 1042 [IQR 504.9 to 1592]. Significant differences were shown between RAS vs ST, LTI and BOS groups, being the p-value of 0.0001, 0.0031 and 0.0055, respectively. KL-6 levels in BALF were higher in ST patients at a median of 262.3 [IQR 117.9 to 661.8]. Significant differences were shown between ST vs LTI patients ($P = 0.0088$) and LTI vs BOS patients ($P = 0.0168$).
Conclusion: LT patients with RAS showed the highest values of serum KL-6. KL-6 in serum may act as a good RAS biomarker. This project is partially supported by the "Sociedad Española de Neumología y Cirugía Torácica" (SEPAR).

OP11 DOES HANGING DONORS BE REALLY MARGINAL FOR LUNG TRANSPLANTATION?

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Background: Success of lung transplantation (LTx) depends on several factors, including the selection of the donor. Hanging donors are mostly excluded, based on pulmonary edema, barotrauma and hypoxia. However there is no evidence of higher LTx morbidity-mortality with lungs providing by suicidal hanging.
Methods: All lung transplantation performed at Foch hospital between January 2010 and July 2015 were analyzed outcomes of LTx to compare hanging donors (Hanging group) with donors having other cause of death (Control group).
Results: During this period 299 LT were performed and divided in 2 groups: Hanging group ($N = 20$) and Control group ($N = 279$). Donor characteristics did not differ in age, sex, time on mechanical ventilation before retrieval, PO2/FIO2 ratio, smoking history, chest X-ray or bronchial secretion. Recipient diagnoses did not differ significantly between the both groups. Primary graft dysfunction (PGD) at 72 hours was no statistically significant between Hanging group ((PGD 0–1 70%, PGD 2 20% and PGD 3 10%)) and Control group (PGD 0–1 61%, PGD 2 23% and PGD 3 16%). Median of post-operative mechanical ventilation duration (1 [range, 0–84] vs 1 [range, 0–435] days), intensive care unit stays (7 [range, 2–66] vs 7 [range, 2–91] days), and total hospital lengths of stay (31 [range, 20–84] vs 32 [range, 12–410] days) did not differ significantly between the two groups. The percentage predicted forced expiratory volume in 1 second at 6 months and 12 months were comparable in both groups (6 months, Hanging 72.3 $\pm$ 35.1% vs. Control 73.3 $\pm$ 20.5%, $P = 0.65$; 12 months, Hanging 65.5 $\pm$ 31.2% vs. Control 78.5 $\pm$ 20.2%, $P = 0.26$). No statistically significant differences were found on the survival between Hanging group and the Control group with respectively at 1 year (83% and 85%) and 2 years (75% and 80%) ($P = 0.76$).
Conclusion: The LT outcomes are not different between hanging donors and the others cause of death. Hanging donors should be considered as conventional donors.

OP12 HIGH URGENCY HEART TRANSPLANTATION IN VIENNA, AUSTRIA

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Introduction: Allocation rules in heart transplantation are discussed globally. In the setting of decreasing heart donation, increasing patient listing brings forth longer waiting times. The use of priority listing of deteriorating patients and the impact of VAD technology has a significant impact on waiting time, outcome on the waiting list and post transplant survival.
Methods: We retrospectively analysed all patients listed for primary heart transplantation in Vienna between 1/2006 to 6/2016. We excluded all actively waiting or patients removed from the waiting list (WL) due to compliance problems, or recovery. We compared median waiting times (days) for HU vs non-HU patients (T status), WL mortality and post transplant outcomes. Moreover, VAD vs non-VAD patients were compared. Furthermore, we analysed different outcomes for HU subgroups. One-year survival was compared with Kaplan-Meier analysis and log-rank test.
Results: Of a total of 431 patients, 395 (91.6%) were transplanted and 36 (8.4%) patients died on WL (5 (14%) while listed as HU, 20 (56%) as T and 11 (30.5%) as not transplantable). Waiting time (WT) was 85 days (25–75%: 13–259). There was no difference in WT between transplanted patients and those who died on the WL 84 (13–248) vs 133.5 (17–283.8; $P = 0.850$). A total of 150 (38%) patients were transplanted as HU and 245 (62%) as T-patients. Death rate for HU patients on the WL was 3.2% vs 7.5% for T-patients. WT for HU patients was 8 days (3–15.3). A total of 100 patients (23.2%) were supported by VAD. Overall, VAD patients waited significantly longer: 199.5 (34.3–476.8) vs 67 (11–194) days; $P < 0.001$), whereas there was no difference in WT between VAD ($n = 35$) and non VAD ($n = 115$) patients if on HU status: 9 (25–75%: 5–22) vs 7 (25–75%: 3–15) days, $P = 0.107$. There was no difference in 1-year survival between HU and T-patients (89.3 vs 86.5%; $P = 0.464$). VAD vs non-VAD patients had similar survival no matter if they were in HU (91.8% vs 86.2%; $P = 0.124$) or in T-status (91.4% vs 88.7%; $P = 0.595$). A subgroup analysis of HU patient groups showed a significantly different 1-year survival depending on time between first listing and HU status (T-HU: 0 days: 95.8%, T-HU: 1–7 days: 70%, T-HU: >7 days: 88.1%, no HU: 86.5%; $P = 0.015$).
Conclusion: Our results show overall short HU waiting times in Vienna, and overall longer waiting times for VAD patients. There was no difference in survival post-TX between VAD and non-VAD survival as well as HU and T-patients. A delay of 1–7 days between T-listing and HU status was associated with a higher death rate.

OP13 INCIDENCE OF CHRONIC RENAL DYSFUNCTION PRIOR TO CARDIAC TRANSPLANTATION: A RETROSPECTIVE SINGLE CENTER ANALYSIS

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Background: The preoperative evaluation of potential cardiac allograft recipients is a necessary method of risk assessment and selection of suitable patients. Current listing criteria suggest evaluation of renal function prior to cardiac transplantation, also due to the possible nephrotoxicity of existing immunosuppressive therapies. Irreversible renal dysfunction (estimated glomerular filtration rate (eGFR) <30 ml/min/1.73 m^2) is considered a relative contraindication for cardiac transplantation. To date no detailed systematic analysis of preoperative renal function parameters in this cohort has been published.
Methods: Our study included 341 patients who received a cardiac allograft between 2005 and 2015 at the Medical University of Vienna. For these patients, we examined functional parameters such as serum creatinine, eGFR and proteinuria, as well as the results of abdominal ultrasonography and computed tomography (CT) investigations. Patients were grouped into Chronic Kidney Disease (CKD) categories according to eGFR (CKD-EPI formula) results. These were evaluated in relation to the results of proteinuria and pathologies seen in imaging studies.
Results: The median eGFR was 59 ml/min/1.73 m^2 (min-max: 6–129 ml/min/1.73 m^2). 47 patients (13.8%) were found to be in CKD group 1, 118 in group 2 (34.6%), 81 in group 3a (23.8%), 74 in group 3b (21.7%), 15 in group 4 (4.4%) and 6 in group 5 (1.8%). Depending on the assessment method, we found severely increased proteinuria in 10% (urine protein-to-creatinine ratio), 1% (protein excretion rate) and 1% (reagent strip urinalysis), and moderately increased proteinuria in 38% (urine protein-to-creatinine ratio), 30% (protein excretion rate) and 32% (reagent strip urinalysis). In 202 patients (59%) abdominal ultrasonography was performed, and in 86 patients (26%) an abdominal CT scan was performed. Pathological findings were present in the ultrasonography of 25 patients (12%), and in the abdominal CT scan of 18 patients (20%). Statistical analysis showed a significant association between ultrasonography results and CKD categories ($P < 0.001$), but no statistical significance between proteinuria results and CKD categories ($P = 0.2$) or CT scan results and CKD categories ($P = 0.09$).
Conclusion: Our data highlights the importance of the preoperative evaluation of renal function using multiple methods, especially renal ultrasonography. We will analyze the significance of pathological results in pre-transplant examinations on long-term renal function after cardiac transplantation in further studies.

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OP14 CARDIAC TRANSPLANTATION IN A NEONATE – FIRST CASE IN SWITZERLAND AND EUROPEAN OVERVIEW

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Pediatric heart transplantation (pHTx) represents a small (14%) but very special part in the field of cardiac transplantation. Twenty-four percent of pHTx are done in children <1 year of age (= infants). Even more challenging are cardiac transplants in newborns as these are even rare. We report the first neonatal cardiac transplant in Switzerland. Further we present data from our survey on performed infant and neonatal transplantations in Western Europe. We report about a female term newborn baby (3.3 kg, body surface area 0.21 m^2) who rapidly deteriorated 90 min after birth following an uncomplicated pregnancy and caesarean delivery. Respiratory failure with subsequent intubation was necessary. Echocardiographic examination revealed a huge tumor within the free wall of the left ventricle (LV) (24 × 52 mm) and obstructing 90% of the main left bronchus. Surgical tumor resection was performed on the sixth day of life. During surgery partial enucleation of tumor including mitral valve, was done. After resection the free wall of the LV was thin and collapsed. Therefore, a Berlin Heart Excor (BH) left ventricular assist device (VAD) had to be implanted (left apex, aorta ascendens). Histology of the tumor revealed a Fibroma. The neonate was listed for cardiac transplantation 12 days after surgery (3.3 kg) since myocardial recovery was unlikely. Six days after listing a donor organ was accepted. The 11 months old donor weighed 11.3 kg and died from severe brain injury. Uncomplicated bicaval cardiac transplantation with an ischaemic time of 3.45 hours was performed. For right ventricular support iNO and intropics were given and slowly weaned. Control bronchoscopy showed a 70% stenosis of the main left bronchus, however the patient was successfully extubated 12 days after transplantation. Immunosuppressive therapy included rATG for 3 days and steroids for 7 days followed by Tacrolimus (day 3) and Mycophenolate. The patient was transferred to a normal ward 20 days after transplantation. The first routine biopsy on postoperative day 30 showed no rejection (ISHLT 0R). We performed a survey of all western European transplant societies/authorities (n:8) asking for the numbers of infant and neonatal transplants performed in the last 10 years. All societies/authorities except Portugal answered the request (1st June 2016). Not surprisingly the numbers are low (see Table) with the most experience coming from the UK. Discussion. Neonatal heart transplantation is a very rare event in Europe. Therefore the authors think it is of crucial

OP15 HEART TRANSPLANT PROGRAM AT MEDITERRANEAN INSTITUTE FOR TRANSPLANTATION AND ADVANCED SPECIALIZED THERAPIES (ISMETT): IMPACT OF PRE AND POST TRANSPLANT MECHANICAL CIRCULATORY SUPPORT USE ON SURVIVAL

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Heart transplantation (HT) improves the quality of life and survival in patients affected by end-stage heart failure. The purpose of the current study is to present the patients' clinical data and results of HT in a single Center of Sicily. Focus on survival after pre and post HTx mechanical circulatory support use will be performed. 133 HT were done from 2004 to the end of 2015. The average donor age was 34 ± 13.5 years and the proportion of male donors was 67%. The leading cause of donor death was head trauma (52.7%). The average male and female recipient's age was 50 ± 11 years and 45 ± 11 years, respectively. Recipient male gender predominates (85%). Coronary artery disease and cardiomyopathy are the leading underlying diagnoses. Percentage of use of mechanical circulatory support (MCS) to bridge patients to HT was 18%. The average ischemic time was 173.2 ± 55.4 minutes: ≤120 minutes in 29 pts (21.8%) and >240 minutes in 15 pts (11.3%). 1-year survival was 83% and 5-year survival was 81% (Fig. 1). Hospital mortality was 14.2% (19pt). Overall pre-transplant MCS was not correlated to worse post-transplant prognosis, $P = 0.757$. Severe primary early graft failure (EGF) strongly impact the early mortality after heart transplantation ($P < 0.001$). Excluding the 90 day mortality, the survival between patients with EGF and those without is similar ($P = 0.693$). Both EGF and mortality risk of patients receiving an "out of region organ" were higher ($P < 0.001$) when compared to those receiving an organ harvested in Sicily. The leading causes of death for all transplant recipients were infections (41.9%), multiple organ failure (22.5%) and irreversible acute graft failure (9.6%), whereas malignancy (9.6%) and arrhythmias/sudden death become progressively more important after 3 to 6 years. 8 patients suffering of severe EGF in which ECMO support was weaned died because of infections (5 patients) and multi organ failure (3 patients). The incidence of any rejection requiring acute treatment and hospitalization was 13.2%. Hypertension (21.4%), renal dysfunction (14.8%), diabetes (2.4%), and cardiac allograft vasculopathy (7.5%) were the most common post-transplant morbidities. Incidence of malignancy was 9% and included lung, kidney and skin cancer (1.6%) and post-transplant lymphoproliferative disorders (2.4%). The results of HT at ISMETT are comparable to

	Neonatal HTx	< 1a
Euro-Transplant	0	39
France	0	2
Italy	2	25
Skandinavia	0	3
Switzerland	1	5
Spain	3	81*(last 19ys)
United Kingdom	10	53

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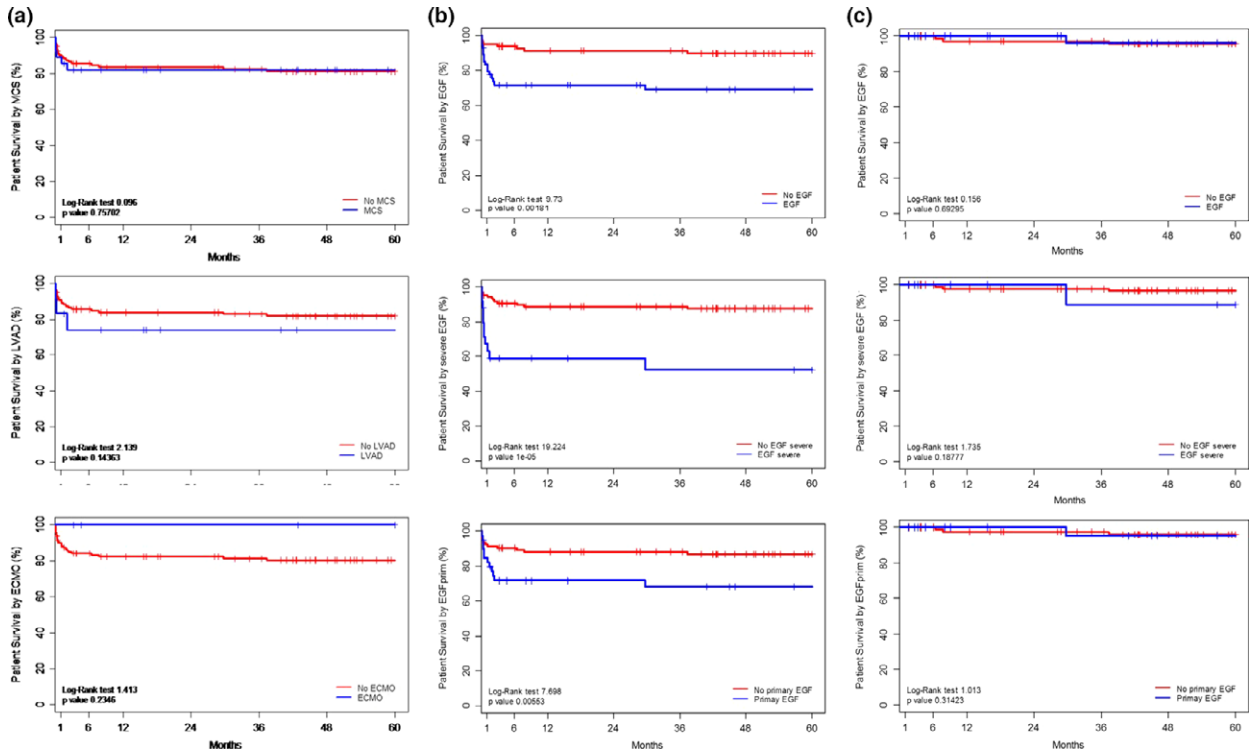

those reported in high volume Italian transplant centers as well as in the ISHLT registry. The favorable outcome can be related to focus on multidisciplinary approach, strict recipients' selection and preparation and young donor population.

OP16 IMPROVED MUSCLE STRENGTH AND QUALITY OF LIFE AFTER RESISTANCE TRAINING IN A PATIENT WITH CONTINUOUS FLOW LEFT VENTRICULAR ASSIST DEVICE

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Background: In patients (pts) with end-stage heart failure (HF) limitations to exercise promote a decline in muscular mass and lead to an impairment of physical constitution and quality of life (QoL). Continuous flow left ventricular assist devices (CF-LVAD) improve hemodynamics and restore activity. However, little is known about the effects of resistance training (RT) in CF-LVAD pts. We hypothesized that RT in CF-LVAD pts is feasible, counteracts frailty and lead to an increase in muscular mass and QoL.
Methods: One pt with terminal dilative cardiomyopathy with implanted CF-LVAD conducted RT exercises individually developed by a sports scientist and supervised by attending physicians 3 times weekly for a total of 5 months. At baseline (BL) and monthly thereafter, body stability and isometric maximum-strength measurements were obtained, as well as the six-minute walking distance (6MWD), spiroergometry, transthoracic echocardiography (TTE), the Minnesota Living with Heart Failure Questionnaire (MLHFQ) and laboratory parameters.
Results: Measurements of isometric maximum-strength showed distinctive improvements with pronunciation in the lower extremity (+106.84% for left and +89.70% for right hamstrings and +106.74% for left and +81.72% for right quadriceps, BL compared to month 5; Figure 1). No major differences were observed in stability tests. 6MWD improved more than 20% in the study period (426 meters at BL vs 494.3 meters at 5 months). Laboratory parameters reflecting ventricular wall stress as n-terminal proBNP and high sensitive Troponin T remained at low levels throughout the observation time, corresponding to stable transthoracic echocardiographic findings (tricuspid annular plane systolic excursion at BL 15.3 mm and 12.8 mm at 5 months). The subjective quality of life improved noticeably (30 points at BL and 12 points at 5 months).
Conclusion: For the first time we proved that specific RT in a CF-LVAD pt led to an improvement of isometric maximum-strength in particular muscle groups. Furthermore, 6MWD and QoL showed a substantial increase and cardiac functional parameters remained stable. As a consequence of our case report further studies are warranted to evaluate RT in pts with CF-LVAD regarding heath constitution and QoL.

OP17 HYPERTHYROIDISM AFTER HEART TRANSPLANTATION

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Background: Hyperthyroidism is a common side effect after amiodarone therapy with varying clinical symptoms up to thyroid crisis. Immunosuppressive drugs like tacrolimus and prednisolone are known to inhibit the pathogenesis of autoimmune disorders or are used to treat hyperthyroidism, respectively. However, here we report about a series of five patients who stopped amiodarone therapy pre-transplant but developed hyperthyroidism after heart transplantation (HTx) for the first time.
Case Reports: Five patients were diagnosed as amiodarone-induced hyperthyroidism although the last treatment with amiodarone was before HTx. After HTx all patients were treated with an immunosuppressive drug regimen consisting out of tacrolimus ($n = 4$) or cyclosporine ($n = 1$) plus mycophenolate mofetil (2–3 g/day) and prednisolone (12.5–55 mg/day). Four patients were treated with amiodarone till transplantation. Three of them developed a hyperthyroidism 1 to 3 months post-HTx, whereas one patient developed a late-onset hyperthyroidism after 11 months. Interestingly, one patient stopped amiodarone therapy 16 months before HTx but also developed a hyperthyroidism 3 months post-HTx. Four of the patients presented with drug resistant symptoms of hyperthyroidism and, consequently, a (hemi-) thyroidectomy was performed. Only one patient could sufficiently treated with injection of dexamethasone into the thyroid combined with thyreostatic therapy.
Summary: Our study showed that patients with amiodarone therapy pre-HTx are at risk to develop hyperthyroidism after HTx. Although tacrolimus and prednisolone are known to reduce the risk for thyroid autoimmune disease, immunosuppression did not prevent progression to thyroid hyperactivity independent of time interval to last amiodarone treatment. Further studies are needed to investigate the potential role of the immunosuppressive drugs in patients treated with amiodarone pre-HTx.

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OP18 DYSLIPIDEMIA AND CARDIAC ALLOGRAFT VASCULOPATHY AFTER HEART TRANSPLANTATION

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Objective : To estimate the frequency of dyslipidemia (DLP) and cardiac allograft vasculopathy (CAV) after heart transplantation (HT).
Methods: From 2010 to June 2016 we performed 73 HT (6%, $n = 4$ – children, mean age – 13.5 ± 2.6 years). All patients were divided into 2 groups according to causes of heart failure: ischemic heart disease (IHD) (44%, $n = 32$; mean age – 54.0 ± 7.1 years) and others (56%, $n = 41$; 38.4 ± 14.7 years). Before HT 41% ($n = 30$) of recipients had the level of cholesterol >4.5 mmol/l. Also 59% ($n = 19$) of IHD recipients underwent CABG or stent-implantation. Recipients have been transplanted from young donors (<40 years) in 55% ($n = 40$) cases. Before HT coronary angiography (CAG) was performed in donors older than 40 years (45%, $n = 33$), coronary artery disease (CAD) presented only in 1 case that is why we did HT and CABG simultaneously. All recipients treated by triple-drug therapy (steroids, calcineurin inhibitors, mycophenolic acid), induction (basiliximab – 74% ($n = 54$), thymoglobulin – 26% ($n = 19$)) and also by statins to treat or to prevent DLP. We estimated the results of cholesterol, CAG and frequency of CAV.
Results: In 6 months after HT the level of cholesterol did not change in patients with IHD (4.7 ± 1.3 and 4.9 ± 1.2 mmol/l, $P = 0.390$). However, it increased in recipients without IHD history (3.8 ± 1.2 and 4.5 ± 0.8 mmol/l, $P < 0.05$). Despite of therapy by statins DLP took place in all children recipients. After HT 3 patients continue smoking. CAV was diagnosed in 19% ($n = 6$) recipients, stents were implanted 3 of them. Almost 1 year after HT 1 patient with no IHD-history got myocardial infarction due to CAV, which required to implant stents. Also 4 years after HT 1 young recipient (25 years) was included in HT waiting list for retransplantation due to severe CAV.
Conclusion: After HT it is important to prevent risks of DLP and CAV not only in patients with IHD, but without and younger one too.

OP19 ECMO INDICATION FOR LUNG TRANSPLANTATION

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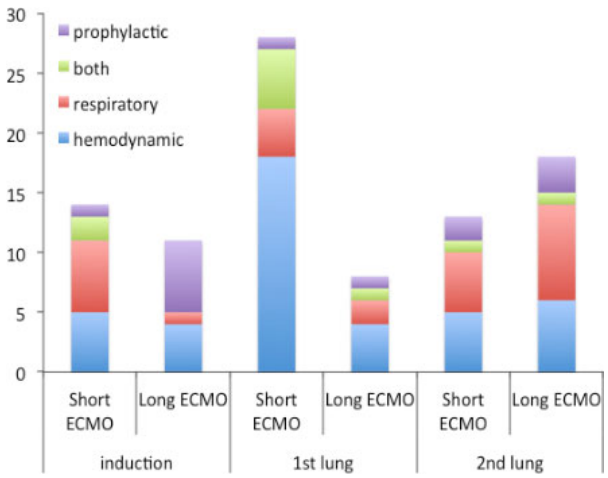
Lung transplantation (LTx) is a lifesaving opportunity treatment in end-stage pulmonary disease. In some situation a per-operative acute event, such as refractory hemodynamic or respiratory failure, may require cardiopulmonary assistance. In our center, LTx is usually performed without systematic assistance. Over these last years, Extracorporeal Membrane Oxygenation (ECMO) has widely replace cardiopulmonary bypass (CPB) (1,2). At the end-surgery stage, some patients can be weaning from ECMO if the event is solved. This study evaluates indication of ECMO veno-arterial during lung transplantation. This retrospective cohort included all patient undergoing for bilateral lung transplantation between January 2012 and July 2015, excluding those on pre-operative ECMO or CPB. This study was approved by ethic committee of the Institutional Review Board of the French learned society for respiratory medicine – Société de Pneumologie de Langue Française. ECMO was inserted for prophylactic, hemodynamic, respiratory or both causes. Anesthesia protocol was standardized. If possible, ECMO was withdrawn at the end of surgery according to a standardized protocol. Results are compared with Fisher's exact test or Mann-Whitney test. Multivariate analysis was used to explore predictive factors for ECMO in LTx. Among the 197 studied patients, 105 patients did not need cardiopulmonary support, 55 required short duration ECMO and 37 a long duration ECMO. Preoperative pulmonary hypertension was an independent factor for ECMO requirement, OR: 2.11; 95% CI: (1.13–3.94), whereas cystic fibrosis and emphysema were protective factors, respectively, OR: 0.20; 95% CI:(0.08–0.5) and OR: 0.12 95% CI: (0.04–0.33). Predictive factors for a long duration ECMO were a high body mass index and ischemic time for the second lung (minutes), respectively OR: 1.22 95% CI: (1.05–1.42) and OR: 1.01 95% CI: (1.0007–1.007), whereas an hemodynamic cause was in favor of a short ECMO: OR: 0.31 95% CI: (0.11–0.85). Figure 1 shows period of ECMO insertion depending on its indication. Nearly half of our lung transplantations are performed under ECMO assistance. Some can be withdrawn at end-surgery stage, specially those implanted for an hemodynamic reason at the first lung implantation time. Ischemic lung time is an important factor for a respiratory failure at end-surgery stage leading ECMO to be followed in ICU. 1. Eur J Cardiothorac Surg. 2007 Mar;31 (3):468–74. 2. J Thorac Cardiovasc Surg. 2015 Apr;149 (4):1152–7.



OP20 EXTRACORPOREAL MEMBRANE OXYGENATION: COMPLICATIONS IN LUNG TRANSPLANTATION

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An intraoperative hemodynamic or respiratory acute event may require cardiopulmonary assistance during lung transplantation (LTx). Over the last years, Extracorporeal Membrane Oxygenation (ECMO) has widely replaced cardiopulmonary bypass in LTx (1,2). ECMO can be withdrawn at the end of the surgical procedure, or it may need to be continued in the Intensive Care Unit (ICU). This study assesses ECMO veno-arterial complications after lung transplantation depending on its duration. This monocenter cohort includes all patients undergoing a bilateral lung transplantation from January 2012 to July 2015, excluding those who had a preoperative ECMO. This study was approved by ethic committee of the Institutional Review Board of the French learned society for respiratory medicine – Société de Pneumologie de Langue Française. We compared three groups: patients without need of ECMO during surgery ("no ECMO"), patients with ECMO removed at the end of surgery ("short ECMO"), and patients with ECMO maintained in the ICU ("long ECMO"). Results are shown as number (percentage) or median [first and third quartiles] and compared with Fisher's exact test and Mann-Whitney test. Among the 197 studied patients, 105 patients required "no ECMO", 55 "short ECMO", and 37 "long ECMO". The in-hospital length of stay was similar between "no ECMO" and "short ECMO" groups, but it was longer for the "long ECMO" group (29 [23–37], 30 [24–53], and 48 [31–73] respectively; $P < 0.001$). Post-operative complications were similar between the "no ECMO" and "short ECMO" groups but was higher in the "long ECMO" group, specially stage 3 primary graft dysfunction (Table). In-hospital mortality was similar between "no ECMO" and "short ECMO" groups, but was higher for "long ECMO" group (2 (2%), 2 (3.6%), and 6 (16%) respectively; $P < 0.001$). A short duration ECMO is safe and did not worsen patients' outcome; this suggests that we should not hesitate to resort to its implementation as soon as standard medical treatment fails to treat a hemodynamic or respiratory event. Maintenance of ECMO after the surgical procedure is associated to poorer outcome. 1. Eur J Cardiothorac Surg. 2007 Mar;31 (3):468–74. 2. J Thorac Cardiovasc Surg. 2015 Apr;149 (4):1152–7.

OP21 THE IMPACT OF EX VIVO LUNG PERFUSION ON BRONCHIAL VITALITY

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Objective: During ex vivo lung perfusion (EVLP) the airway tree is not perfused and it is therefore exposed to a longer "ischemic" period. Aim of the study is to evaluate bronchial vitality of lung grafts treated with EVLP and to compare the incidence of bronchial complications after lung transplantation (LTx) using standard and "reconditioned" lungs.

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	No ECMO	Short ECMO	Long ECMO	P-value
Hemorrhagic shock	4 (4%)	3 (5%)	10 (27%)	$< 0.001^{\dagger\ddagger}$
Lower limb complications	2 (2%)	1 (2%)	6 (16%)	$0.002^{\dagger\ddagger}$
Septic shock	13 (12%)	13 (23%)	16 (43%)	$< 0.001^{\dagger}$
Bronchial Ischemia	40 (38%)	27 (49%)	19 (51%)	0.24
Grade 3 of primary graft dysfunction	10 (10%)	15 (27%)	24 (65%)	$< 0.001^{*\dagger\ddagger}$

* : if difference between no ECMO and short ECMO groups
† : if difference between no ECMO and long ECMO groups
‡ : if difference between short ECMO and long ECMO groups

Methods: From June 2015 to May 2016, 38 bronchial rings have been collected before LTx using standard (Group A: 19) and "reconditioned" (Group B: 19) grafts. EVLP was performed using a controlled acellular perfusion according to the Toronto technique.
Results: The comparison of ischemic time between group A and B (without the EVLP period) did not show any statistical difference, although reconditioned grafts had a longer out of the body period due to the EVLP procedure ($P < 0.01$). In group A, bronchial vitality of the first vs the second graft was 52.4 ± 19.8 and 63.94 ± 5.48% (P = ns) and in group B 60.57 ± 23.17 vs 57.63 ± 22.24% (P = ns), respectively. The comparison of bronchial vitality in group A vs group B did not show any statistical difference. No cases of bronchial complications have been recorded in both groups.
Conclusion: EVLP increases the "out-of-the-body" time of the graft. In our experience, EVLP time does not seem to have an impact on bronchial vitality and on bronchial anastomosis healing. A larger population is mandatory to better validate our preliminary results.

OP22 ANALYSIS OF COMORBIDITIES AND INFECTIOUS COMPLICATIONS IN LUNG TRANSPLANTATION: IS A NEW "SELECT" SCORE A PROGNOSTIC TOOL?

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Lung transplantation (LTx) is a therapeutical option for end-stage lung diseases. Many factors influence the outcome. Previous studies have identified recipient-, donor-, and transplant-specific characteristics, which confer an increased risk of post-LTx mortality. The lung allocation score (LAS) has demonstrated acceptable predictive strength for outcomes after LTx. The mortality after lung transplantation (MALT) score represents the first known risk stratification tool that incorporates both recipient- and donor-specific characteristics to predict 1-year mortality after LTx. The aim of our study was to evaluate the impact of pre- and post-LTx events on survival of patients who underwent to LTx in Turin Lung Transplant Centre. We conducted a retrospective observational study including all lung transplanted patients, from 1st January 2011 to 31st march 2013, who potentially completed a 2 years of follow-up. We evaluated comorbidities, type of surgical procedure and post-LTx trend (functional, infections and rejections). We considered as "event" each episode, scheduled or not, which was suspected for a pulmonary infection or an acute reject. For each post-LTx observation we created a score (SELeCT) based on Symptoms (presence, variability), physical Examination, Leucocytosis, leukopenia, increased CRP, new Thoracic radiological findings. We included 54 patients: 21 with obstructive disease (COPD), 11 with cystic fibrosis (CF), 22 pulmonary fibrosis (PF). Pre-transplant factor influencing survival were: coronaric disease and age ≥65 years ($P < 0.05$); no other pre-transplant factors influenced mortality. Most common microbiological findings were: herpes viruses, nosocomial bacteria and Aspergillus. CF group had higher bacterial infections rate. Acute rejection, often asymptomatic, occurred especially in the first semester, most commonly in PF patients. Chronic rejection was observed in 32.6% of patients, and in half of the cases it presented the characteristics of a restrictive syndrome. Clinical impairment during exacerbations (measured by SELeCT score) was inversely correlated to survival ($P < 0.001$), in particular a score >2 (<0.01), as well as mycotic infections ($P < 0.05$). The most important prognostic factors were age above 65 years and coronary artery disease. Our results suggest mycotic infections have an impact on mortality. The proposed SELeCT score correlates with clinical trends and it can be an useful tool in diagnostic and therapeutic decisions, giving more relevance to clinical presentation than etiopathogenesis of the single event.

OP23 ENOXAPARIN PROPHYLAXIS FOR PREVENTION OF VENOUS THROMBOEMBOLISM AFTER LUNG TRANSPLANTATION

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Venous thromboembolism (VTE) is as a major complication after solid organ transplantation (SOT) and, specifically, after lung transplantation (LT). The objective of this study was describe risk factors and to evaluate low molecular weight heparin (LMWH) as a prophylactic strategy for VTE in LT.
Methods: Clinical records of 333 patients who underwent lung transplantation in our institution between 2009 and 2014 were retrospectively reviewed for VTE during the first year after transplantation. Risk factor analysis was performed using Cox proportional hazards regression model. We compared two cohorts, one receiving LMWH only during post transplant hospital admissions, and a second cohort that received 90 day-extended prophylaxis with LMWH.
Results: The incidence VTE in our cohort was 15%. Median time from transplant to the event was 40 days (p25–p75 14–112). 90-day extended prophylaxis was not useful in preventing this complication. We identified male gender and IPF as risk factors for VTE.
Conclusions: VTE is a major complication after LT and 90 day-extended prophylaxis is not useful in preventing it. Large, multicentric, randomized clinical trials should be performed to identify risk factors and design prevention strategies for VTE in lung transplant patients.

OP24 REAL-TIME IMAGING WITH THE O-ARM OF LUNG PARENCHYMA DURING EX-VIVO LUNG RECONDITIONING

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Introduction: Ex vivo lung perfusion (EVLP) has been developed as a method to reassess and repair damaged lungs. However, evaluation of the lung during procedure is limited to a combination of physiological variables as gas exchange, pulmonary mechanics (stable peak inspiratory pressure and dynamic compliance), and pulmonary vascular resistance. The aim of this study is to analyse the feasibility and utility of a scan via the O-Arm (Medtronic, Inc., Minneapolis, MN, USA) imaging to help the evaluation of the lung during ex vivo lung reconditioning (EVLR) procedure in Operating Room. (image1)
Methods: We evaluated three consecutive extended-criteria brain-death donor lungs during EVLR. For functional evaluation, the following variables were assessed: partial pressure of arterial oxygen (Pao2), pulmonary vascular resistance (PVR), and lung compliance (LC) every hour. For parenchyma evaluation, the lungs underwent a scan via the O-Arm, a fluoroscopic device capable of providing three-dimensional images through the use of cone-beam technology at 1 hour and 4 hours.
Results: Among the 3 pairs of donors lungs, 2 were transplanted because they recovered physiological function with PaO2/FiO2 ratio more than 400 mmHg, stability of other functional parameters (PVR and LC) and lung attenuation of ground-glass opacification in scan. However, one pair of lungs was not transplanted because of the deterioration of the pulmonary vascular resistance, the peak inspiratory pressure, and dynamic compliance. This pulmonary functional impairment was associated with the emergence of a massive pulmonary oedema on the per-procedure O-Arm scan. Discussion

The use of a high-performance real-time imaging system, such as O-Arm, to evaluate lung grafts from extended-criteria donors during EVLR show an additional argues to select and increase the lung transplants pool.

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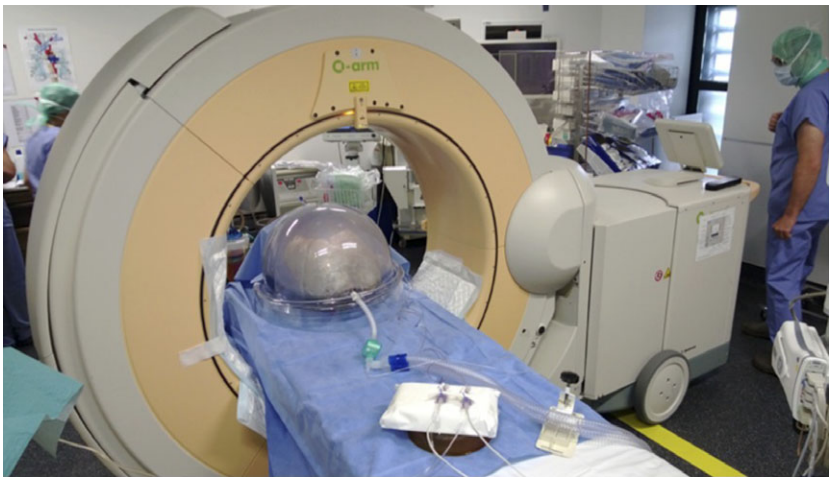

OP25 DONOR-RECIPIENT SIZE MISMATCH AND RISK OF EARLY GRAFT DYSFUNCTION IN PATIENTS WITH PULMONARY HYPERTENSION: POTENTIAL ROLE OF MATCHING BASED ON PREDICTED HEART MASS

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Background: Pulmonary hypertension (PH) is a known risk factor for early graft dysfunction (EGF) after heart transplantation (HT). Current practice advocates matching with oversized donor in order to reduce the risk of EGF. We explore the hypothesis that donor-recipient matching based on predicted heart mass (pHM) would be superior to matching based on weight or body mass index (BMI) in predicting the risk of EGF.
Methods: This study is based on a registry including all consecutive isolated HT performed at two Centers between 1999 and 2013. pHM for both donor and recipient was calculated according to previously described equations (1,2). Study population was divided in quartiles according to percentage difference in pHM, body weight and BMI. We classified recipients according to the presence of PH, defined as pulmonary vascular resistance (PVR) >3 WU. Study endpoint was the occurence of EGF, defined as need for mechanical circulatory support within 24 hours from surgery. In-hospital mortality was recorded as well.
Results: Study population includes 518 HT recipients (age 52 ± 12 y, 81% male), 121 of whom had PH. Size mismatch based on pHM, weight and BMI quartiles did not predict EGF and in-hospital mortality in general population nor in patients without PH. In the PH subgroup, difference in pHM was related to increased incidence of EGF. While no differences were recorded among the first three quartiles, patients in the most undersized one (median pHM difference 19%, [8.3–37.8%]) experienced higher incidence of EGF (34% vs 10% OR 4.5 [95% CI 1.57–12.9, $P = 0.005$]) and had a non-significant higher in-hospital mortality (23% vs 12%, $P = 0.2$). pHM remained a significant predictor of EGF also after correction for gender mismatch. The most undersized quartile according to body weight ($P = 0.051$) had a less robust statistical association with the same results, while stratification based on BMI was not related to different outcomes.
Conclusions: Size mismatch amplifies the risk of early graft dysfunction after heart transplantation in recipients with pulmonary hypertension. Size matching using predicted heart mass better stratifies the risk of EGF than weight and BMI-based methods. References 1 Bluemke DA et al. The relationship of left ventricular mass and geometry to incident cardiovascular events: the MESA (Multi-Ethnic Study of Atherosclerosis) study. J Am Coll Cardiol. 2008;52:2148–2155. 2 Kawut SM et al. Sex and race differences in right ventricular structure and function: the MESA right ventricle study. Circulation. 2011.

OP26 TRYING TO OPTIMIZE HEART TRANSPLANT OUTCOMES IN OLDER CANDIDATES: ARE ALL COMORBIDITIES CREATED EQUAL?

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Introduction: Patient (pts) selection is crucial to achieve good prognosis after heart transplant (HT) and keep equity. Several factors are known to influence post-HT outcome, but their interplay with recipient age is poorly explored. Aiming to optimize older patients risk profiling, we designed this study to weigh risk factors for post-HT outcome across recipient age strata.
Methods: We analyzed the association among pre-HT clinical, haemodynamic and laboratory data of pts receiving HT in our Center in 1999–2013 and post-HT (10-years) survival. Risk factors were stratified according to recipient age (</> 60 years), deriving two age-specific risk scores, calculated on the basis of adjusted odds ratios (OR), considering variables with $P < 0.1$.
Results: 418 pts (age: 52 ± 12 years, 32% > 60 years, 80% males, 20% diabetes (DM), 42% ischemic cardiomyopathy (CAD), 63% with GFR < 60 ml/min) were analyzed. During a 17 years follow-up, 273 pts died accounting for a 66.7 ± 2.6% 10- yrs survival. Older pts (>60 years) had a lower survival ($P = 0.002$), driven by a higher rate of cancer ($P < 0.01$) and infection-related death ($P = 0.03$), with a similar rate of cardiac death ($P = 0.72$), and fewer episodes of cellular rejection ($P = 0.03$). Multivariate analysis revealed different weight of comorbidities in influencing outcome across the two age strata: UNOS-1A status (OR: 2.1), sensitization (OR: 2.2), GFR < 60 ml/min (OR: 1.99), donor age > 40 years (OR: 1.6) (all $P < 0.05$), DM (OR:1.6, $P = 0.07$) in young pts, while in old pts: status 1A (OR:4.7), PVR > 3 (OR:2.4), CAD (OR:1.9), (all $P < 0.05$), GFR < 60 ml/min ($P = 0.08$). We calculated age-specific derived risk scores defining high-risk pts those with a score >2 in the younger and >4 in the older cohort (median value respectively). Young low risk pts had the best estimated 10-yrs survival, while old low risk pts had a better outcome than the young high risk (69.2 ± 6.7% vs 56.5 ± 7.2%, $P < 0.001$). High-risk pts (young and old) had similar outcomes, even after conditioning survival >1 year.
Conclusion: Comorbidities influence post-HT outcome differently according to age, while high urgency status impacts survival regardless of age. HT may be considered as first choice strategy in selected older pts with low risk profile, in whom may provide better outcomes than younger with high-risk profile (i.e. sensitized with GFR < 60 ml/min). In older low risk pts, mortality appears to be related to consequences of immune senescence or overimmunosuppression. Strategies different from HT in pts >60 y at high-risk may improve equity in resources allocation.

OP27 OUTCOME OF HVAD BRIDGED TO TRANSPLANTATION PATIENTS AFTER HEART TRANSPLANTATION – A SINGLE CENTER EXPERIENCE

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Objectives: In recent years, the number of heart-transplant patients bridged to transplantation by Left Ventricular Assist Devices has increased to 37% (ISHLT registry 2015). This is despite data that suggests mechanically supported recipients suffer inferior mortality rates after transplantation. While studies have been published reporting the differences between the outcomes of pulsatile and continuous flow devices, including specifically the HeartMate II, no data has been reported on the outcome of HeartWare HVAD devices. We report our experience with the HeartWare HVAD LVAD in bridged to transplantation recipients after heart transplantation.
Methods: We retrospectively reviewed the data of 50 patients who have been bridged to transplantation with the HeartWare LVAD, and afterwards underwent heart transplantation between April 2007 and March 2016 at Vienna Cardiac Transplant Center. Study endpoints were recipient and donor demographics, operative outcome, long-term survival and incidence of adverse events, defined as rejection, infection and graft vasculopathy.

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Results: Mean patient age was 50 ± 14 years, 38 were male and underlying disease was of dilatative origin in 62%. 30% of the recipients were listed primary as high-urgency (HU) and median duration of HVAD-support was 563 ± 392 days (range 3–2279). We observed nine (18%) cases of graft rejection requiring treatment over the course of this study, seven (78%) of which occurred in the first six months after transplantation and three (33%) having resulted in death. High panel reactive antibody activity (PRA >10%) prior to transplantation was observed in only two (4%) patients (PRA 97% and 37% respectively). Two (4%) recipients were diagnosed with graft vasculopathy and therefore required percutaneous coronary intervention (PCI) at 539 and 629 days after heart transplantation respectively. Four (8%) patients experienced fatal infection resulting in death at 58, 213, 222 and 613 days post-transplant. 30-day and in-hospital mortality rates were 0% and 4% respectively. One-year survival was 92%.
Conclusion: As the first transplant center reporting on the long-term outcomes of patients having received the Heartware HVAD as a bridge to transplantation device, our findings indicate that it is a feasible and safe alternative to other continuous-flow devices. While our findings do include a substantially lower post-transplant mortality rate in comparison to other studies, a multi-center study is still desirable in order to confirm these results.

OP28 INDUCTION THERAPY WITH ANTI-THYMOCYTE GLOBULIN VERSUS BASILIXIMAB IN HEART TRANSPLANT PATIENTS: A SINGLE CENTER EXPERIENCE

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Background: Antibodies may be used for induction of immunosuppression in heart transplantation (HT). rATG is commonly used but thrombocytopenia may prevent repeated doses and Basiliximab can be used as an alternate agent. The relative efficacy of these rATG and Basiliximab on allograft rejection and clinical outcomes is uncertain. Aim. To compare survival, incidence of rejection and episodes of infection in the first year after HT in patients who received induction with rATG alone versus patients who were unable to complete induction with rATG.
Methods: We studied 72 consecutive patients who underwent HT between January 2013 and December 2014 at Papworth Hospital. Patients were grouped according to the induction therapy received; (A) 3 doses rATG (cumulative dose 1.75 mg/kg) and (B) 1 dose rATG (1 mg/kg) followed by Basiliximab (40 mg) when thrombocytopenia prevented further use of rATG. The primary endpoint was time to first episode of acute cellular rejection (ISHLT grade 2R or above). Secondary endpoints were survival, episodes of treated rejection, episodes of infection or a diagnosis of post-transplant lymphoproliferative disorder (PTLD).
Results: There were significant differences in baseline characteristics and post-operative adverse events. Patients in group B were older ($P = 0.03$), had a higher percentage of female donors ($P = 0.02$), greater need for post-operative mechanical circulatory support ($P = 0.01$), greater need for post-operative CVVH ($P < 0.01$) and more frequent re-operation for bleeding ($P = 0.02$). The median time to first episode of rejection was 45 days in group A and 45.5 days in group B ($P = 0.98$). There was no difference in freedom from rejection at 1 month, 6 months and 1 year between group A (80%, 54%, 48%) and group B (82%, 61%, 61%, $P = 0.32$). There was no difference in the incidence of infection between groups ($P = 0.62$). There were no diagnoses of PTLD in either group. Survival at 1 year was 97% in group A and 80% in group B ($P = 0.02$). All deaths were due to primary graft dysfunction and none due to acute rejection.
Conclusion: We observed no difference in the incidence of rejection in patients that were unable to complete induction with rATG and instead received Basiliximab, compared with those who completed induction with rATG. Survival was lower in patients that were received Basiliximab, probably due confounding by baseline characteristics and post-operative adverse events. Use of Basiliximab may be a safe option in patients who develop thrombocytopenia and are unable to complete induction with rATG.

OP29 EXTENDED USE OF RATG OR BASILIXIMAB ALLOWS DELAYED CNI INITIATION IN PATIENTS WITH RENAL DYSFUNCTION AFTER HEART TRANSPLANTATION

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Background: Calcineurin inhibitors (CNI) may delay recovery from acute kidney injury after heart transplantation (HT). Oliguria is common after initiation of CNI and an advantage of antibody induction is that CNI may be avoided until renal function has recovered. When renal recovery is delayed, repeated antibody doses may be used to delay CNI initiation and bridge patients to renal recovery.
Aim: The aim was to evaluate renal function and the incidence of rejection, infection and PTLD in patients with delayed renal recovery after HT who receive extended antibody induction in order to delay CNI initiation. Methods. We included 66 consecutive patients who underwent HT between January 2013 and December 2014 at Papworth Hospital. Patients were grouped according to induction received: (A) Standard induction with 3 doses antibody and (B) Extended induction with more than 3 doses antibody due to prolonged renal dysfunction after HT. The primary endpoint was need for renal replacement therapy or estimated glomerular filtration rate (eGFR) of <30 ml/min/1.73 m^2 at 1 year post HT. Secondary endpoints were survival at 1 year after HT and

Characteristics	All (n = 72)	rATG (n = 37)	Basiliximab (n = 35)	P value
Recipient age, years	49.9 [35.6-59.2]	44.5 [33-53]	55.8 [38.6-59.9]	**0.03**
Recipient gender, female	22 (30%)	14 (22%)	8 (40%)	0.09
Recipient height, cm	171.6 ± 13.5	171.8 ± 15.7	171.5 ± 10.9	0.91
Donor age, years	40 [28.3-51.8]	39 [23.5-49.5]	44 [33-54]	0.08
Donor gender, female	29 (40.28%)	10 (27%)	19 (54.3%)	**0.02**
Donor height, cm	174 ± 9.8	176 ± 9.4	173 ±10.2	0.25
Diagnosis:				0.62
CAD	10 (14%)	6 (16%)	4 (11%)	
Cardiomyopathy	58 (81%)	30 (81%)	28 (80%)	
Congenital	0	0	0	
Heart valve disease	1 (2%)	0	1 (2.8%)	
Myocarditis	3 (4%)	1(3%)	2 (5.7%)	
Inotropic support pre HT	27 (35.7%)	14 (37.8%)	13 (37.1%)	0.95
Diabetes Mellitus	5 (7%)	3 (8%)	2 (5%)	0.68
Hypertension	7 (9%)	3 (8.1%)	4 (11.4%)	0.63
Stroke	5 (6.9%)	2 (5.4%)	3 (8.6%)	0.56
Peripheral vascular disease	3 (4%)	1 (2.7%)	2 (5.7%)	0.80
Status:				0.24
Urgent	44 (61%)	25 (67.6%)	19 (54.3%)	
Routine	28 (39%)	12 (32.4%)	16 (45.7%)	
Waiting list, months	2.5 [0.8-13.8]	2.1 [1-13.8]	2 [0.5-14.2]	0.61
MCS before HT	25 (35%)	17 (46%)	8 (22.9%)	**0.04**
Creatinine before HT, µmol/L	123.7 ± 42.7	125 ± 7	121 ± 7	0.68
PVR ,Wood units	2.3 ± 1.03	2.4 ± 1	2.32 ± 1.0	0.88
TPG, mmHg	7.5 ± 2.8	7.7 ± 2.8	7.2 ± 2.8	0.46
VA ECMO or VAD after HT	7 (9.7%)	1 (2.7%)	6 (17.1%)	**0.04**
Time in ICU, days	7.5 [4-26.5]	6 [3-26.5]	10 [3-27]	0.21
Need for CVVH after HT	35 (49%)	12 (32%)	23 (66%)	**< 0.01**
Reoperation for bleeding	19 (26%)	5 (13%)	14 (40%)	**0.02**
Time to first episode of rejection, days	45 [17-97.3]	45 [17-97.3]	45.5 [15.5-114.5]	0.98

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Characteristics	All (n = 66)	Standard antibody induction (n = 47)	Extended antibody induction (n = 19)	P value
Recipient age, years	45.9 [35.6-59.2]	44 [34-55]	53 [33-60]	0.17
Recipient gender, female	21 (32%)	15 (32%)	6 (32%)	0.98
Recipient height, cm	171.7 ± 13.9	171.3 ± 14.9	172.5 ± 11.3	0.76
Donor age, years	41.5 [29-52.3]	39 [25-50]	50 [38-55]	**0.02**
Donor gender, female	29 (40.28%)	18 (38%)	9 (47%)	0.5
Donor height, cm	174.8 ± 9.77	174.6 ± 9.7	175 ±10.1	0.5
Diagnosis				0.25
CAD	9 (14%)	5 (11%)	4 (21%)	
Cardiomyopathy	53 (80%)	40 (85%)	13 (69%)	
Congenital	0	0	0	
Heart valve disease	1 (2%)	0	1 (5%)	
Myocarditis	3 (4%)	2 (5%)	1 (5%)	
Inotropic support pre HT	24 (36.4%)	16 (34%)	8 (42%)	0.53
Diabetes Mellitus	4 (7%)	2 (4%)	2 (10%)	0.22
Hypertension	6 (9%)	3 (6%)	3 (16%)	0.33
Stroke	5(8%)	4 (9%)	1 (5%)	0.58
Peripheral vascular disease	3 (4%)	2 (4%)	1 (5%)	0.98
MCS before HT	24 (36%)	19 (40%)	5 (26%)	0.28
Creatinine before HT, μmol/L	121.14 ± 42.3	117.9 ± 45.8	129.5 ± 31.3	0.32
PVR, Wood units	2.3 ± 1	2.24 ± 1.1	2.34 ± 0.84	0.74
TPG, mmHg	7.2 ± 2.7	7.2 ± 2.6	7.2 ± 2.8	0.93
Ischaemic time, minutes	160 ± 38.6	153 ± 36	177 ± 40.6	**0.02**
VA ECMO or VAD after HT	7 (10.6%)	1 (2.1%)	6 (31.6%)	**<0.01**
Time in ICU, days	9 [4-28.3]	6 [4-24]	15 [9-34]	**0.01**
Need for CVVH after HT	34 (51%)	18 (38%)	16 (84%)	**<0.01**
Duration of CVVH after HT, hours	119 [58-302]	80 [50.8-120.3]	132 [55-345]	**<0.01**
Need for RRT at 1 year	2 (3%)	0	2 (10.5%)	**0.02**
eGFR <30 at 1 year	6(11%)	2 (4.8%)	4 (30.8%)	**<0.01**
Serum Creatinine at 1 year	114 [92.8-133.8]	111 [92-130.5]	129 [100.5-266]	0.06

episodes of treated rejection (ISHLT grade 2R or above), episodes of infection and development of PTLD during year 1.
Results: There were no differences in recipient baseline characteristics. Patients in group B had older donor age ($P = 0.02$), longer ischaemic time ($P = 0.02$) and were more likely to have required post-transplant MCS ($P < 0.01$) and CVVH ($P < 0.01$). The primary endpoint was reached in 4.8% of group A, but 35.7% of group B despite delayed CNI initiation ($P < 0.01$). The median serum Creatinine at 1 year was 111 μmol/l in group A and 129 μmol/l in group B ($P = 0.06$). There was no difference in freedom from rejection at 1 month, 6 months and 1 year after HT ($P = 0.32$) and incidence of infection between groups ($P = 0.62$). No patients developed PTLD. Survival at 1 year was 93% in group A and 73% in group B ($P = 0.03$). All deaths were due to primary graft dysfunction and none due to acute rejection.
Conclusion: Although we observed significant renal dysfunction at 1 year in patients with prolonged post-operative acute kidney injury, there was no increase in the incidence of rejection, infection or PTLD with use of extended antibody induction. Survival was lower in these patients, probably due to confounding by baseline characteristics and post-operative adverse events. Extended antibody induction may be a safe option in patients with post-operative renal dysfunction in whom delayed CNI initiation is desirable.

OP30 BETACTIC STUDY – BEST THERAPY AFTER CARDIAC TRANSPLANTATION, THE ITALIAN CHALLENGE

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Introduction: Survival after heart transplantation (HTx) has improved, while the attrition rate beyond the 1st year did not change substantially. Cardiac allograft vasculopathy (CAV) and cancer are the leading causes of death late after HTx. Significant morbidity/mortality derive from renal insufficiency and vascular complications.
Hypothesis: Everolimus (EVR) and Mycophenolate (MMF) were adopted due to better efficacy vs Azathioprine in de novo HTx. However, EVR and MMF have not been tested in a head to head comparison late after HTx. We assessed the effect of EVR and MMF on renal function late after HTx.
Methods: BeTACTIC is a multicenter, randomized, Investigator-driven trial, funded by the National Health Service, comparing efficacy and safety of EVR and MMF in association with Cyclosporine (CyA) in pts with acute multiple/late rejection (3 or more episodes requiring steroids), CAV, worsening renal dysfunction, enrolled at least 1 year after HTx and followed-up for 3 years. The primary endpoint was a composite of hierarchical occurrence of death, retransplantation, hospitalization for cardiovascular causes, reduction of EF, progression of CAV detected with coronary angiography/IVUS, renal function worsening and cancer.
Results: A total of 80 pts with a median age of 60 years, 84% men, were randomized in 9 Transplant Centers in Italy. Hypertension was present in 70% of pts, diabetes in 22.5%, CAD history CAD in 6.3%, and CHF in 7.6%. HTx was mainly due to dilated (47.4%) and ischemic (44.7%) cardiomyopathies. At 12 months, patients showing worsening of renal function accounted for the 32.5% of the cumulative incidence of the primary endpoint (53.8%). We evaluated the changes in the estimated glomerular filtration rate (eGFR) at 6 and 12 months from baseline. At 6 months the mean changes in eGFR did not differ between EVR and MMF (+1.25 vs 1.32, $P = 0.98$); at 12 months there was a trend in favor of MMF, even if not statistically significant (+5.25 vs 0.92, $P = 0.18$), stronger in patients assigned to MMF and enrolled in the trial after 5 years or more from HTx. We observed a significant reduction of CyA trough level in patients assigned to EVR.
Conclusions: From our data, it seems that EVR behaves differently in chronic vs de novo patients, particularly if the shift is made more than 5 years after transplantation.

OP31 EFFECTS OF EXTRACORPOREAL PHOTOPHERESIS ARE BASED ON THE REJECTION STATUS AFTER HEART TRANSPLANTATION

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Background: No clear consensus consist on how to use ECP after heart transplantation (HTx). The clinical use of extracorporeal photopheresis (ECP) is based on its ability to induce cell-mediated immune tolerance towards foreign and self antigens. In this pilot study, we evaluated the stimulatory effects of ECP on immune cells in HTx patients.
Methods: HTx patients received ECP therapy as prophylaxis of rejection (PRX; $n = 7$) or to treat acute cellular rejection (ACR, $n = 5$) or chronic allograft vasculopathy (CAV; $n = 3$). ECP was performed according to a specific treatment protocol for each group. Blood samples were taken before, after the third ECP cycle and 2 months after the last ECP cycle. Blood samples were analyzed for the tolerance-inducing cell subsets regulatory T cells (Tregs), myeloid and plasmacytoid dendritic cells (m and pDCs). The stimulatory effect was calculated from the baseline value without ECP treatment compared to the values after the third ECP treatment and 2 months thereafter.
Results: Our pilot study gave first hints that the response profile between ECP-treated patients with PRX, ACR and CAV differed regarding the cellular parameters mDCs, pDCs and Tregs. A high stimulatory effect for pDCs and mDCs was detected for patients of the PRX (pDCs: 11.1 fold increase; mDCs:

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1.7 fold increase) and the ACR group (pDCs: 3.7 fold increase; mDCs: 1.4 fold increase) 2 months after the last ECP cycle. ECP-treated patients with CAV showed a lower stimulatory effect 2 months after ECP treatment for pDCs (1.6 fold increase) and no effect for mDCs. Treg profile analysis revealed a high stimulatory effect in the CAV and the PRX group (both 1.2 fold increase) and a moderate reduction in the ACR group (0.9 fold) 2 months after ECP treatment.
Conclusion: In our pilot study, we showed different stimulatory effects of ECP on DCs and Tregs between prophylactic and preemptive ECP therapy after HTx. Immunological monitoring could be valuable to develop an individual ECP therapy strategy in patients without, acute or chronic rejection.

OP32 CARDIAC SURGERY AFTER HEART TRANSPLANTATION – ELECTIVE OPERATION OR LAST EXIT STRATEGY

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Background: Improved survival after cardiac transplantation with better long-term outcome as well as transplantation of marginal donor hearts may lead to late pathologies in the graft that might need surgical intervention. The aim of this study was to evaluate risk factors for cardiac surgery after heart transplantation and associated morbidity and mortality.
Methods: In this retrospective, single-centre study, we evaluated patients that underwent cardiac surgery after cardiac transplantation at our institution. Between March 1984 and September 2014, 17 (1.24%) out of 1369 cardiac transplant patients underwent cardiac surgery after transplantation. Indication for surgical intervention was valvular disease in 41.2% ($n = 7$), graftvasculopathy in 29.4% ($n = 5$), infectious aortic pseudoaneurysm 5.9% ($n = 1$), aortic dissection 5.9% ($n = 1$), ventricular assist device implantation 5.9% ($n = 1$), pericarditis constrictive 5.9% ($n = 1$), iatrogen coronary artery dissection 5.9% ($n = 1$). 82.4% ($n = 14$) were male, 17.6% ($n = 3$) female. Median time to surgery after transplantation was 9.4 years (2.7–11.3).
Results: Return to theatre was necessary due to bleeding in 3 patients. In hospital mortality was 11.8% ($n = 2$), need of re- transplantation was 11.8% ($n = 2$) due to graftvasculopathy 3 and 9 month after operation. Median survival after surgery was 506 days (242–2884), 47.1% ($n = 8$) are still alive. 17.6% ($n = 3$) were emergency procedures, 82.4% ($n = 14$) were elective cases. In hospital mortality for emergency operations was 66.7% ($n = 2$), for elective operations 0% ($n = 15$).
Conclusion: In comparison to other studies, the incidence of cardiac surgery after transplantation in our cohort was low (1.24%). In elective operations, survival was good but emergency surgery had a high in-hospital mortality.

Disclosure Statement: None of the above mentioned authors has a conflict of interest to disclose.

CC04 EX VIVO HEART PRESERVATION PERMITTED TO REVEAL AN HIDDEN CORONARY DISSECTION

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An alternative to cold ischemic storage for heart transplantation is a new ex vivo normothermic donor heart perfusion: the Organ Care System (OCS) developed by TransMedics Inc. The ex vivo preservation of donor hearts in a beating status has many potential advantages: reduced ischemic time, extended criteria for donor enrollment, thorough assessment of heart quality, evaluation of heart performances with echo and coronary angiography (even in absence of cath-lab), more time for donor assessment. We present a case report where functional assessment of the heart played a crucial role. The donor was a 18 yrs Caucasian female, 160 cm, 60 kg, 0 Rh +. She died for a car accident with head trauma. Haemodynamic was stable (SR 100 bpm, ABP 125/70 mmHg, Hct 32%, Dopamine 5 ug/kg/min), echo demonstrated normal wall motion and function (EDD 44 mm, PWD 11 mm, EF 76%, IVSD 11 mm) and no valve pathologies. The coronary angiography was not performed because the donor was a young female with no risk factors for coronary artery disease. This seemed to be an excellent donor, but expected ischemic time was 4 hours so we decided to utilize the OCS for the retrieval. During the transport, lactate level continued to rise despite the optimization of the coronary flow and pressure of perfusion, so we decided to discard the organ. At the pathological examination a right coronary dissection was found, probably a consequence of the fatal trauma. This coronary disease would have made the heart restart very unlikely in case of transplantation. Ex-vivo perfusion settings and lactate levels are important parameters in the assessment of donor hearts, and in our experience OCS showed the ability to unmask hidden pathologies undetected at the retrieval and potentially fatal for the recipient.

CC05 PRIOR PULMONARY HOMOGRAFT IMPLANTATION MAY LEAD TO SEVERE EARLY ANTIBODY MEDIATED REJECTION

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We report a case of a 31-year-old male patient who received a cardiac allograft at our hospital due to dilated cardiomyopathy in 2015. Our patient had received a Ross procedure in 1998 with a pulmonary homograft from our institution. In 2015, rapid progression of a dilated cardiomyopathy led to cardiogenic shock requiring intravenous inotropic support. Transplantation was performed successfully and the patient was extubated on the first postoperative day (POD) in stable conditions. A pericardial haematoma without hemodynamic relevance was observed during routine echo control. On the 5th POD, he deteriorated suddenly and required cardiopulmonary resuscitation and re-intubation. Acute sternotomy was performed to remove the hematoma, which was, however, not compressing the heart. Gradual stabilisation was achieved with ECMO support. The transesophageal echocardiography revealed biventricular failure which did not improve. At this stage, suspicion of hyperacute rejection was made as the potential underlying condition and treatment with methylprednisolone and immunoadsorption was initiated. Following repeated cycles of immunoadsorption, ventricular function, contractility and ejection fraction improved. Subsequently the patient was weaned from ECMO. However, he developed sepsis with bilateral pneumonia under intensified immunosuppression. Antibody-mediated rejected was diagnosed due to histologic findings and panel reactive antibodies. Panel reactive antibody reveals a fulminant increase from 0% (pre-transplant) to 83% (6th POD) and decreased concurrently under immunoadsorption to 77% (14th POD), 63% (16th POD) and 40% (20th POD). The HLA typing results of our patient and the homograft donor in 1998 revealed that both carried HLA-B18 and HLA-CW7 molecules. Therefore, the implanted homograft during the Ross procedure likely induced specific antibody formation. Due to the long time-span between the Ross procedure and the heart transplantation, no circulating antibodies were measured, but reactivation of memory cells may lead to this fulminant rejection episode. For future cases, particular attention must be paid to patients with tissue grafts. These patients may need to be evaluated carefully for potential unacceptable antigens present in donor organs.

CC01 HEART TRANSPLANT FROM INFECTED DONORS WITH HEPATITIS C: 5 YEARS LATER

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For patients diagnosed with end-stage heart failure heart Transplantation remains the gold-Standard therapy. Despite shortage of appropriate donor organs, Transplantation of Hepatitis C infected(HCV) hearts are disputed. However, previous Research has shown that long-term results are controversial and the risk of severe clinical infection should be not underestimated. Here we Report a case of a 43 years old Patient who received a heart from Hepatitis C infected donor as a high risk Transplantation.

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