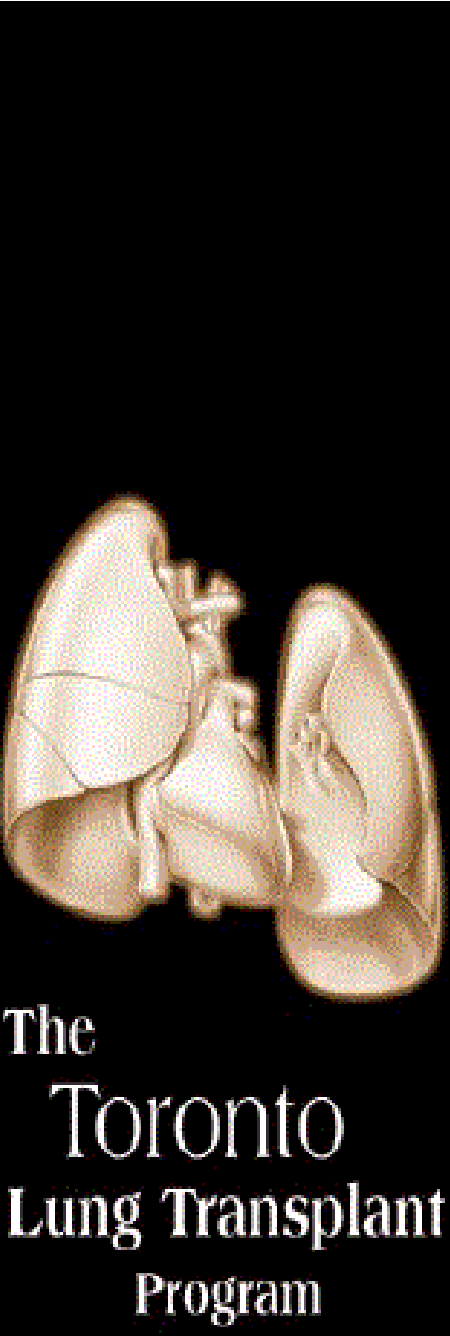




Outcomes of single vs. bilateral lung transplant in patients with chronic obstructive pulmonary disease (COPD)



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Purpose

There are contradictory reports on outcomes after bilateral lung transplantation (BLT) compared to single lung transplantation (SLT) in patients with COPD, which may be confounded by differences in allocation preferences and patient care between transplant programs. We present our single center outcome data of SLT vs. BLT for COPD

Methods

We retrospectively analyzed data of COPD patients who underwent lung transplantation in our center between Jan 2008 and Dec 2018. Donor and recipient demographics, postoperative characteristics, overall allograft survival, and chronic lung allograft dysfunction (CLAD) free survival (ISHLT criteria) between SLT and BLT were evaluated. Pre- and post-transplant characteristics were compared between groups with chi-square and t-tests where appropriate. Unadjusted Kaplan-Meier survival estimates were used to compare differences in freedom from CLAD and allograft survival with log-rank tests

Results

Between Jan 2008 and Dec 2018, 276 patients of COPD underwent lung transplantation in our centre. Out of 276 patients 233 (84.4%) underwent BLT and 43 (15.6%) SLT. Pre-transplant baseline characteristics of donor and recipients are shown in **Table 1**.

Table 1. Baseline pretransplant characteristics of recipients and donors.

Characteristics*	Bilateral	Single	p-value
Recipient Age (y)	61 (57 -67)	63 (59-69)	0.04
Sex (male)	128 (55)	23 (53)	0.861
Waitlist time (months)	3 (1-8)	4 (2-10)	0.68
Urgency status at listing**	1(1-2)	1 (1-2)	0.50
FEV1 (%predicted)	20 (16-25)	19 (16-25)	0.82
CMV primary mismatch (D +/R -)	53 (23)	8 (18)	0.53
6MWD meters	295 +(83)	303 + (81)	0.55
Creatinine clearance (µmol/L)	94 (79-102)	91 (75-98)	0.61
BMI (kg/m²)	23 (20 -27)	26 (21 -27)	0.17
Hospitalized pretransplant	18 (8)	1 (2)	0.41
ICU admission pretransplant	7 (3)	0	0.25
Coronary artery disease	82 (35)	17 (39)	0.68
mean PAP (mmHg)	25 (21-28)	25 (19-31)	0.31
Donor Age (y)	53 (36-61)	49 (28-54)	0.01
Donor Cigarette (pack year)	0 (0-10)	0 (0-10)	0.77
Donor type			
DBD	187 (80)	34 (79)	0.858
DCD	46 (20)	9 (21)	
Virtual cross match positive	26 (11)	4 (9)	0.29
Actual cross match positive	8 (3)	4 (9)	0.14

Continuous variables presented as mean ± standard deviation (SD) or median (interquartile range). Categorical variables presented as n(%). P value <0.05 used for significance.

Abbreviations: CMV: Cytomegalovirus, 6MWD:6minute walk distance, BMI:Body mass index, PAP: Pulmonary arterial pressure, DBD: Donation after brain death, DCD:Donation after circulatory death, ICU: Intensive care unit, FEV1:Forced expiratory volume in 1 second, 6MWD: 6minute walk distance.

**Urgency status: We list patients from status 1 to 3 with increasing priority; status 1 being stable and Status 3 indicating a rapidly deteriorating patient

The BLT group required more intraoperative ECMO [14% vs. 2.3% p=0.03] and blood transfusion [40% vs. 19% p=0.02]. SLT group required more Ex vivo lung perfusion [49% vs. 29% p=0.01].As shown in **Table 2**, the remainder of intraoperative findings were similar between the groups.

Table 2. Perioperative and postoperative outcomes in BLT vs. SLT recipients.

Characteristics*	Bilateral	Single	p-Value
Ischemia Time (minutes)	613 ±(242)	627 ± (240)	0.74
Postoperative ECLS	9 (4)	0	0.19
Ventilator days	2 (1-3)	1 (1-2)	0.04
ICU Length of stay (days)	3 (2-7)	3 (2-9)	0.36
Hospital length of stay (days)	22 (16-33)	19 (14-29)	0.12
Best achieved FEV1 (L)	2.75 (2.2-3.39)	1.63 (1.39-1.92)	<0.0001
Best achieved FVC (L)	3.28 (2.73-4.05)	2.55 (2.11-3.30)	<0.0001
Best achieved 6MWD (m)	460 ± (94)	418 ± (93)	0.017

*Continuous variables presented as mean ± standard deviation(SD) or median (interquartile range). Categorical variables presented as n(%). P-value <0.05 used for significance.

Abbreviations: ECLS: extracorporeal life support, ICU: Intensive care unit, FEV1:Forced expiratory volume in 1 second, FVC: Forced vital capacity, 6MWD: 6minute walk distance

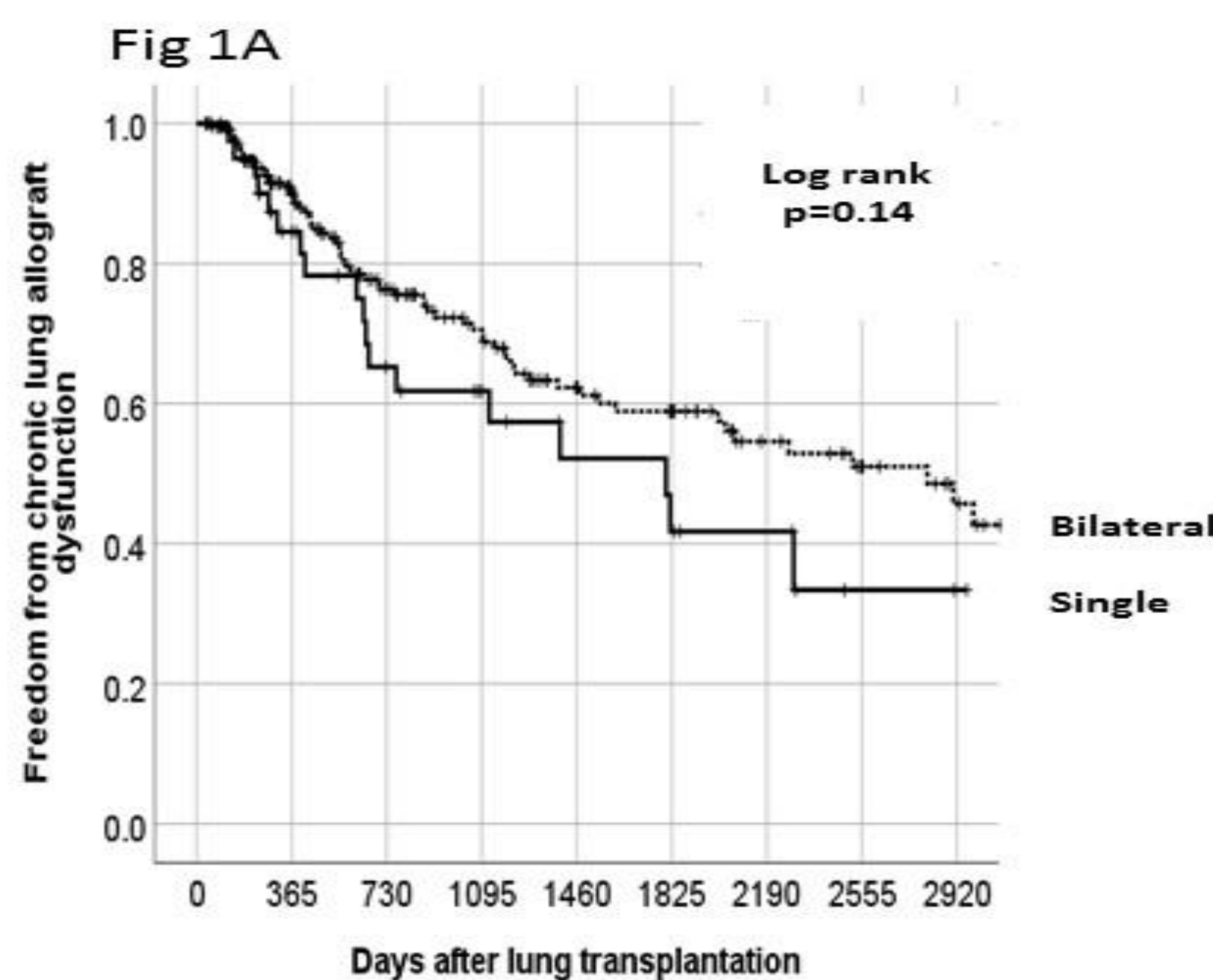


Fig 1A. CLAD free survival after BLT vs. SLT for COPD.

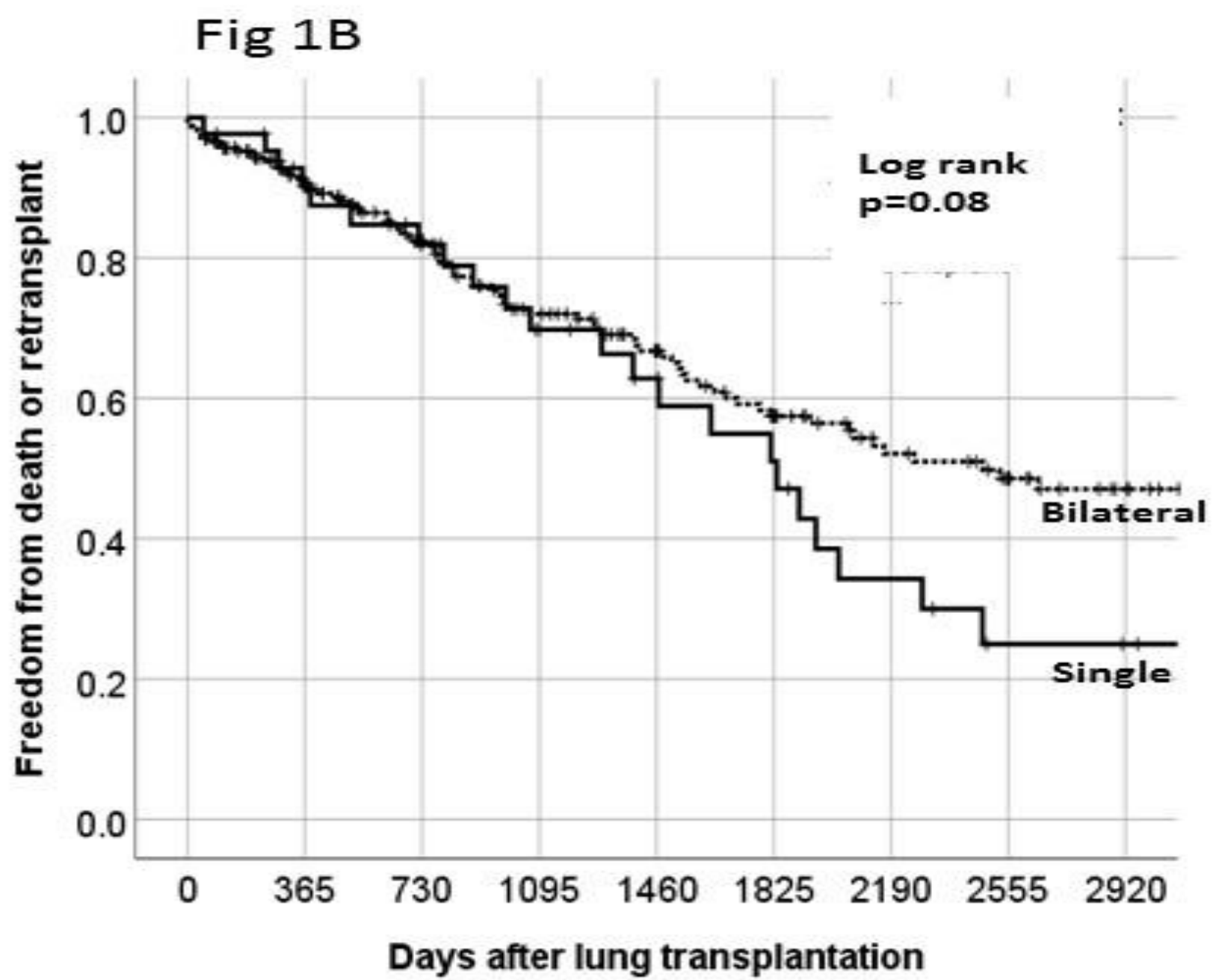


Fig 1B. Allograft survival after BLT vs. SLT for COPD

Conclusion

BLT recipients had significantly better postoperative lung function and exercise capacity than SLT recipients. The time to postoperative liberation from mechanical ventilation was shorter in SLT recipients. There was a trend towards better survival in BLT recipients after 5 years but it did not reach statistical significance. There was no difference in CLAD free survival between the BLT and SLT recipients.