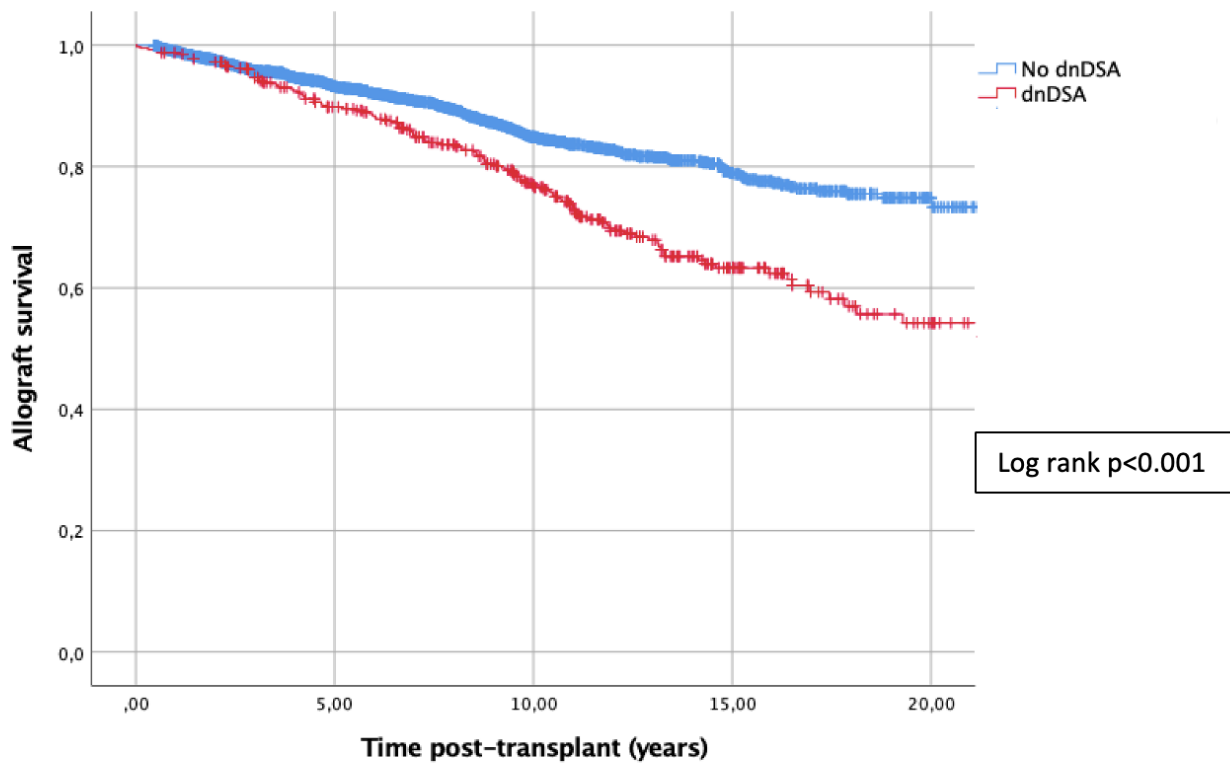


Supplementary Material

Supplementary Figure 1. Survival analysis of death-censored graft failure in patients with dnDSA and without dnDSA ('Control group').

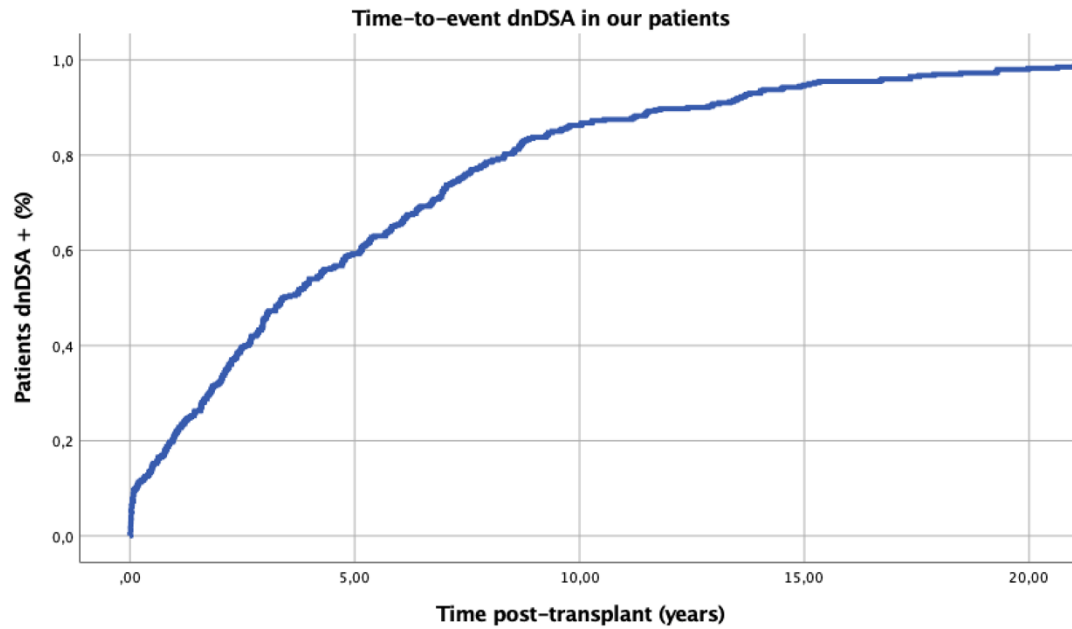
Patients with dnDSA of our study (n=400) had significantly lower graft survival after transplantation (Log rank $p < 0.001$) compared to the 'Control group' *.

*'Control group': n=2752 patients without dnDSA (and without preformed DSA) in the same follow-up period of our study.



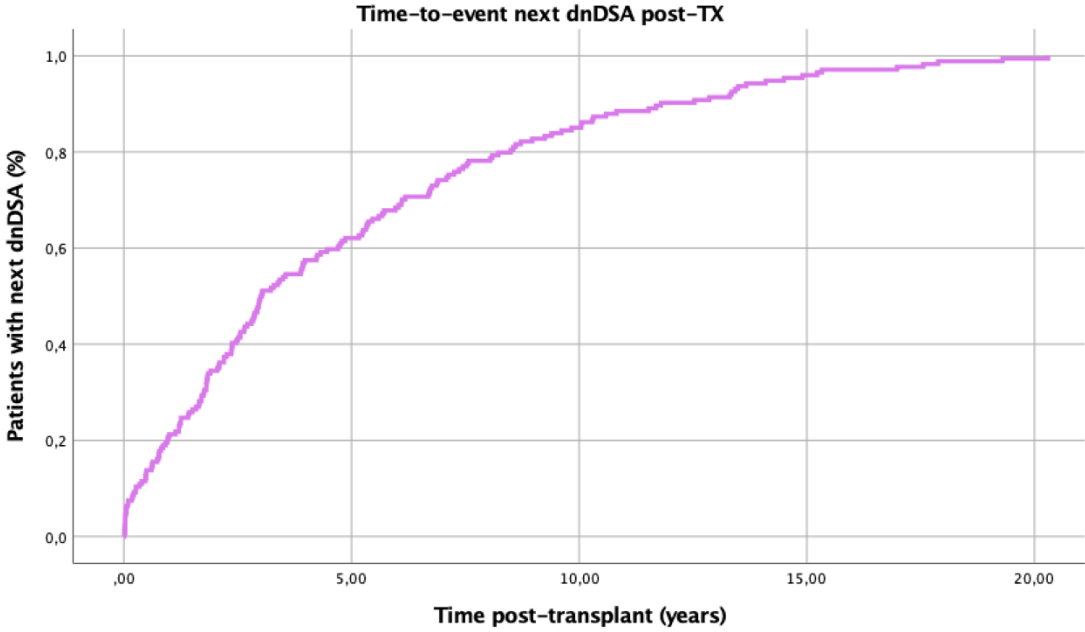
Supplementary Figure 2. Time to first occurrence of first dnDSA in 400 patients.

Median time from transplant to first occurrence of first dnDSA: 3.4 years (IQR: 1.3 - 7.3).



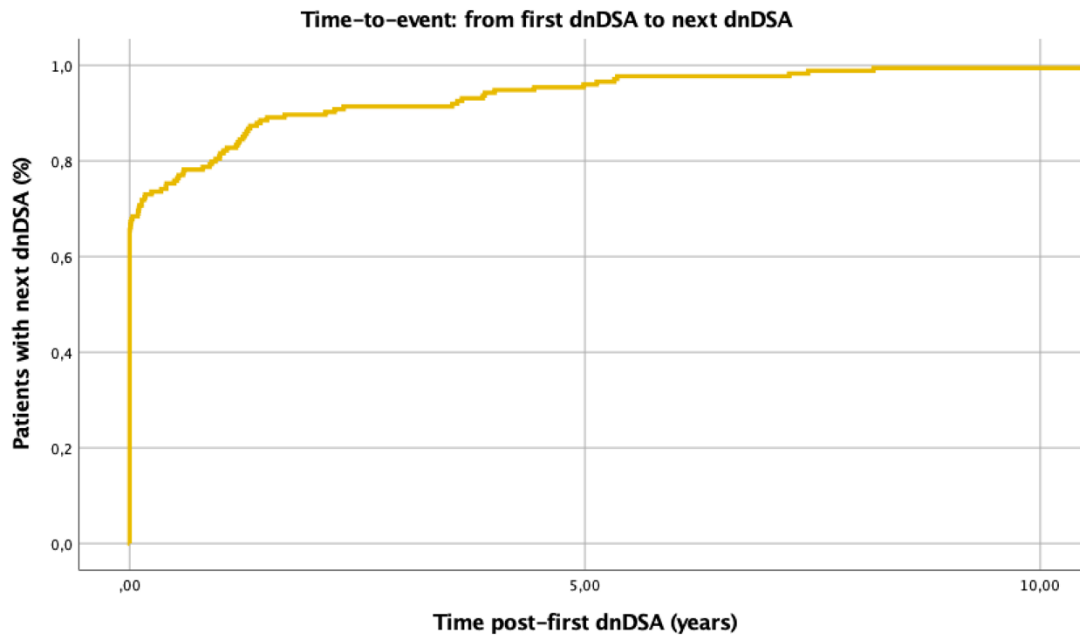
Supplementary Figure 3. Time to occurrence of another dnDSA (next dnDSA) after transplant in 174 patients with >1 dnDSA.

Median time from transplant to next dnDSA (≥ 1): 3.0 years (IQR: 1.3 - 7.1).



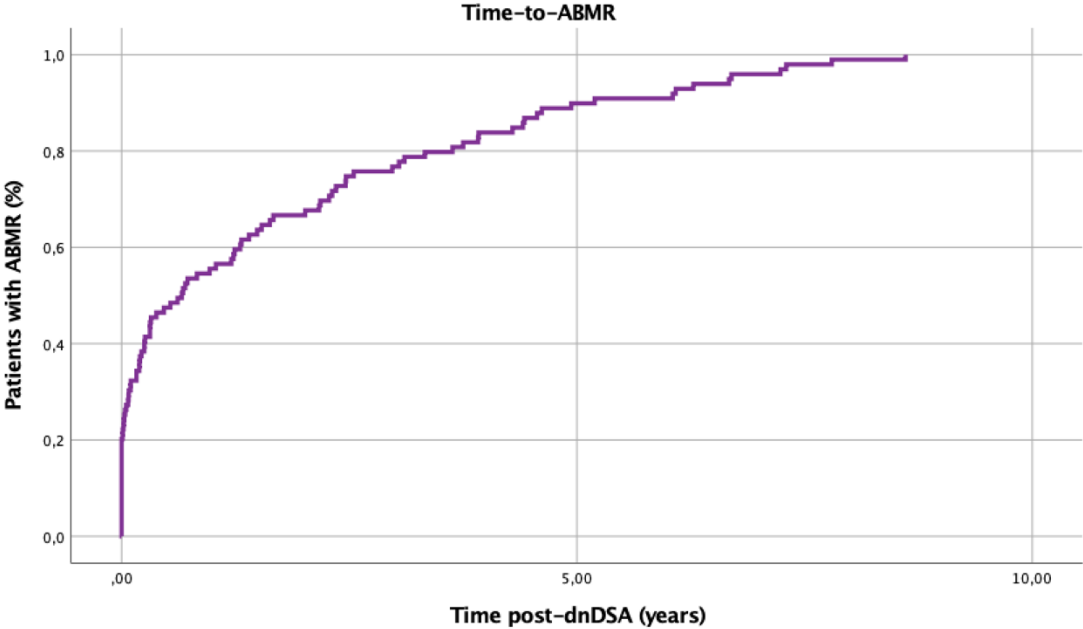
Supplementary Figure 4. Time to occurrence of another dnDSA (next dnDSA) from first occurrence of first dnDSA in 174 patients with >1 dnDSA.

Median time from first occurrence of first (≥ 1) dnDSA to next first appearance of another (≥ 1) dnDSA: 0.0 years (IQR 0.0 - 0.4).



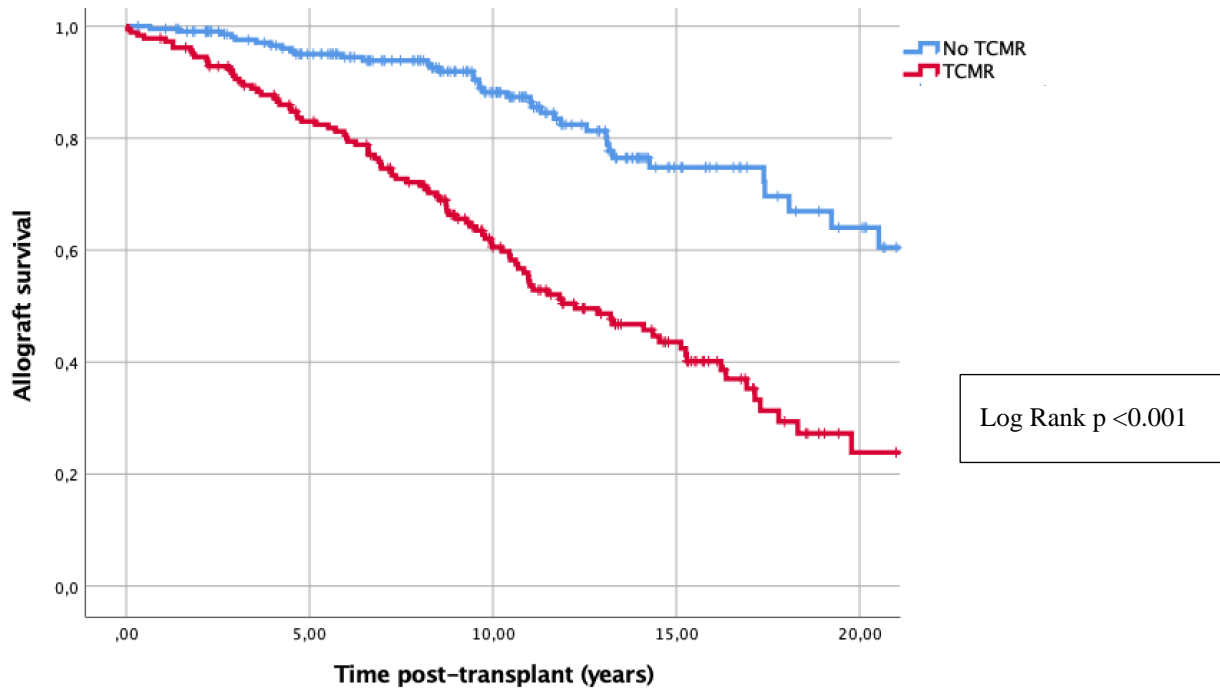
Supplementary Figure 5. Time to antibody-mediated rejection (ABMR) from first occurrence of first dnDSA in 99 patients.

Median time from first occurrence of first dnDSA to ABMR: 0.6 years (IQR: 0.0 - 2.5)

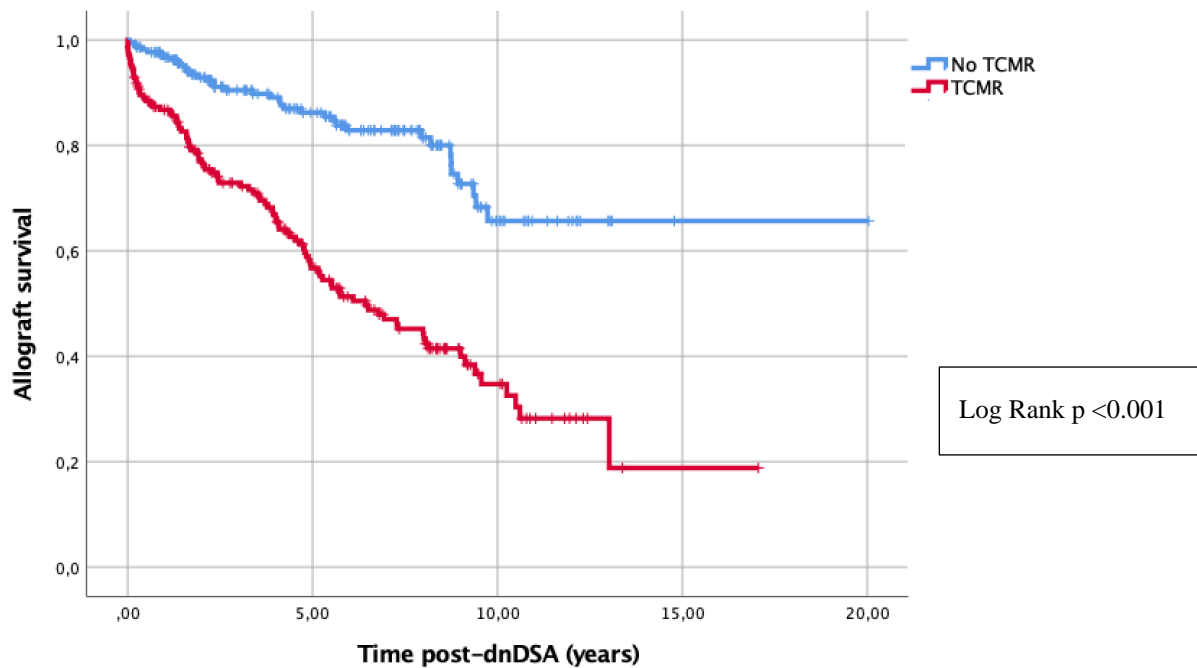


Supplementary Figure 6. Survival analysis of death-censored graft failure and TCMR.

- 1) Those patients with at least one episode of TCMR had significantly lower graft survival after transplantation (Log rank $p < 0.001$).

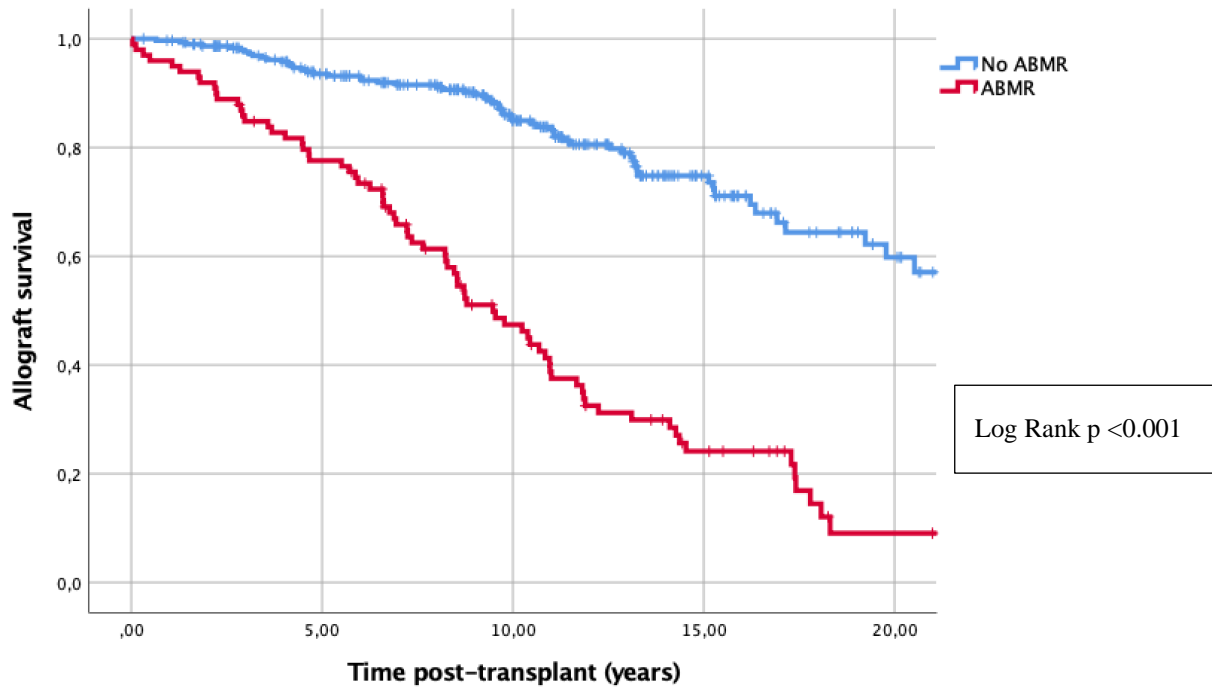


- 2) Those patients with at least one episode of TCMR had significantly lower graft survival after dnDSA appearance (Log rank $p < 0.001$).

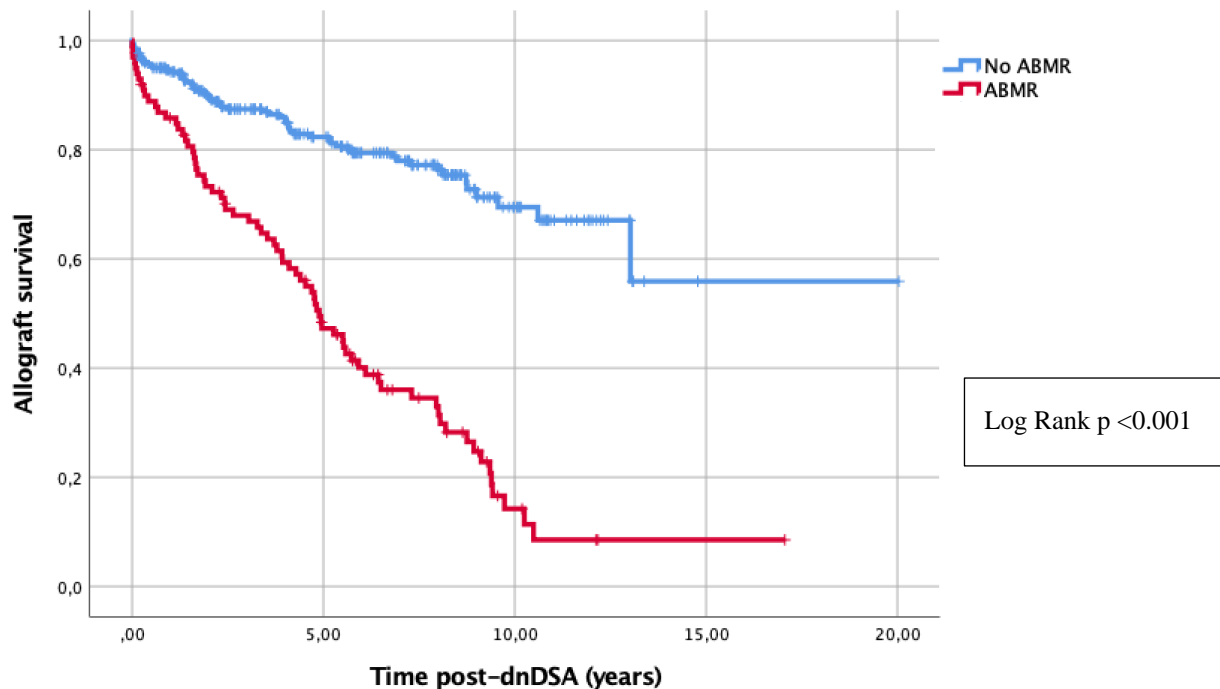


Supplementary Figure 7. Survival analysis of death-censored graft failure and ABMR

- 1) Those patients with at least one episode of ABMR had significantly lower graft survival after transplantation (Log rank $p < 0.001$).

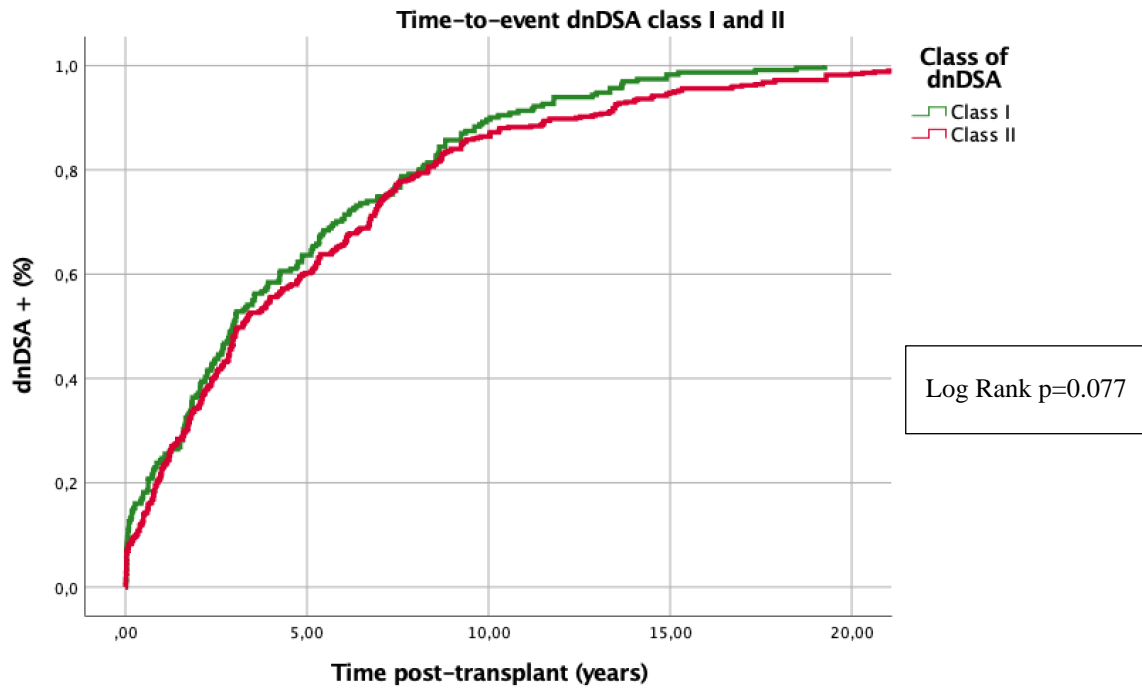


- 2) Those patients with at least one episode of ABMR had significantly lower graft survival after dnDSA appearance (Log rank $p < 0.001$).



Supplementary Figure 8. Time to class I and class II dnDSA in 731 dnDSA.

No significant differences between time to class I and II dnDSA (log rank $p=0.077$).



Supplementary Table 1. Observed data, last observation carried forward (LOCF) analysis and multiple imputation (MI) of estimated glomerular filtration rate - eGFR - values (ml/min) before and after first occurrence of first dnDSA.

<u>Time (months)</u>	<u>-24mo</u> <u>(n=147)</u>	<u>-12mo</u> <u>(n=174)</u>	<u>First</u> <u>dnDSA</u> <u>(n=306)</u>	<u>+12mo</u> <u>(n=235)</u>	<u>+24mo</u> <u>(n=175)</u>	<u>+36mo</u> <u>(n=234)</u>	<u>+48mo</u> <u>(n=211)</u>
<u>Observed data</u> <u>(Median values,</u> <u>ml/min)</u>	48.0	46.0	41.0	42.0	41.0	41.5	41.0
	<u>-24mo</u> <u>(n=147)</u>	<u>-12mo</u> <u>(n=174)</u>	<u>First</u> <u>dnDSA</u> <u>(n=306)</u>	<u>+12mo</u> <u>(n=324)</u>	<u>+24mo</u> <u>(n=336)</u>	<u>+36mo</u> <u>(n=267)</u>	<u>+48mo</u> <u>(n=276)</u>
<u>LOCF</u> <u>(Median values,</u> <u>ml/min)</u>	48.0	46.0	41.0	41.0	40.0	41.0	40.5
	<u>-24mo</u> <u>(n=147)</u>	<u>-12mo</u> <u>(n=174)</u>	<u>First</u> <u>dnDSA</u> <u>(n=306)</u>	<u>+12mo</u> <u>(n=330)</u>	<u>+24mo</u> <u>(n=330)</u>	<u>+36mo</u> <u>(n=330)</u>	<u>+48mo</u> <u>(n=330)</u>
<u>MI</u> <u>(Median values,</u> <u>ml/min)</u>	48.0	46.0	41.0	42.5	41.3	39.6	38.2
<u>Time (months)</u>	<u>+60mo</u> <u>(n=192)</u>	<u>+72mo</u> <u>(n=156)</u>	<u>+84mo</u> <u>(n=121)</u>	<u>+96mo</u> <u>(n=102)</u>	<u>+108mo</u> <u>(n=65)</u>	<u>+120mo</u> <u>(n=37)</u>	
<u>Observed data</u> <u>(Median values,</u> <u>ml/min)</u>	41.0	39.0	38.0	32.5	34.0	41.0	
	<u>+60mo</u> <u>(n=281)</u>	<u>+72mo</u> <u>(n=281)</u>	<u>+84mo</u> <u>(n=282)</u>	<u>+96mo</u> <u>(n=282)</u>	<u>+108mo</u> <u>(n=284)</u>	<u>+120mo</u> <u>(n=284)</u>	
<u>LOCF</u> <u>(Median values,</u> <u>ml/min)</u>	38.0	35.0	33.5	30.0	30.0	30.0	
	<u>+60mo</u> <u>(n=330)</u>	<u>+72mo</u> <u>(n=330)</u>	<u>+84mo</u> <u>(n=330)</u>	<u>+96mo</u> <u>(n=330)</u>	<u>+108mo</u> <u>(n=330)</u>	<u>+120mo</u> <u>(n=330)</u>	
<u>MI</u> <u>(Median values,</u> <u>ml/min)</u>	37.2	34.4	34.0	30.9	29.4	29.1	

Supplementary Table 2. Observed data, last observation carried forward (LOCF) analysis and multiple imputation (MI) of proteinuria values (mg/g creatinine) before and after first occurrence of first dnDSA.

<u>Time (months)</u>	<u>-24mo</u> <u>(n=144)</u>	<u>-12mo</u> <u>(n=184)</u>	<u>First</u> <u>dnDSA</u> <u>(n=340)</u>	<u>+12mo</u> <u>(n=212)</u>	<u>+24mo</u> <u>(n=195)</u>	<u>+36mo</u> <u>(n=159)</u>	<u>+48mo</u> <u>(n=164)</u>	<u>+60mo</u> <u>(n=166)</u>
<u>Observed data</u> <u>(Median values,</u> <u>mg/g creatinine)</u>	174.0	140.0	182.0	153.0	167.0	184.0	173.5	181.0
	<u>-24mo</u> <u>(n=144)</u>	<u>-12mo</u> <u>(n=184)</u>	<u>First</u> <u>dnDSA</u> <u>(n=340)</u>	<u>+12mo</u> <u>(n=343)</u>	<u>+24mo</u> <u>(n=347)</u>	<u>+36mo</u> <u>(n=237)</u>	<u>+48mo</u> <u>(n=246)</u>	<u>+60mo</u> <u>(n=252)</u>
<u>LOCF</u> <u>(Median values,</u> <u>mg/g creatinine)</u>	174.0	140.0	182.0	171.0	187.0	163.0	187.0	193.5
	<u>-24mo</u> <u>(n=144)</u>	<u>-12mo</u> <u>(n=184)</u>	<u>First</u> <u>dnDSA</u> <u>(n=340)</u>	<u>+12mo</u> <u>(n=306)</u>	<u>+24mo</u> <u>(n=306)</u>	<u>+36mo</u> <u>(n=306)</u>	<u>+48mo</u> <u>(n=306)</u>	<u>+60mo</u> <u>(n=306)</u>
<u>MI</u> <u>(Median values,</u> <u>mg/g creatinine)</u>	174.0	140.0	182.0	177.2	199.8	299.8	285.1	309.0

<u>Time (months)</u>	<u>+72mo</u> <u>(n=143)</u>	<u>+84mo</u> <u>(n=117)</u>	<u>+96mo</u> <u>(n=99)</u>	<u>+108mo</u> <u>(n=58)</u>	<u>+120mo</u> <u>(n=32)</u>
<u>Observed data</u> <u>(Median values,</u> <u>mg/g creatinine)</u>	187.0	176.0	193.0	252.0	252.0
	<u>+72mo</u> <u>(n=255)</u>	<u>+84mo</u> <u>(n=258)</u>	<u>+96mo</u> <u>(n=260)</u>	<u>+108mo</u> <u>(n=261)</u>	<u>+120mo</u> <u>(n=261)</u>
<u>LOCF</u> <u>(Median values,</u> <u>mg/g creatinine)</u>	216.0	232.5	223.5	236.0	258.0
	<u>+72mo</u> <u>(n=306)</u>	<u>+84mo</u> <u>(n=306)</u>	<u>+96mo</u> <u>(n=306)</u>	<u>+108mo</u> <u>(n=306)</u>	<u>+120mo</u> <u>(n=306)</u>
<u>MI</u> <u>(Median values,</u> <u>mg/g creatinine)</u>	443.7	545.4	517.9	529.7	448.3