

Introduction

A 22 month old female patient with multiple congenital cardiac anomalies presented with acute decompensated heart failure.

Patient received numerous blood exposures due to multiple procedures, including LVAD and ECMO placement which caused a significant increase in the patient’s class I antibody reactivity (94% cPRA).

To widen the donor pool for the patient, surrogate crossmatches and 1:8 dilutions done with negative serum were performed to assess if desensitization was possible. Our lab chose A3 and B7 as the antibodies to test due to having the highest MFI reactivity. It was determined that A3 could be removed as a UNOS unacceptable, and B7 remained as a UNOS unacceptable antigen because the MFI did not significantly decrease when run at a 1:8 dilution. B7 remained greater than 10,000 MFI suggesting that desensitization likely would not reduce the antigen reactivity.

One month later the patient was offered a deceased donor A3-positive heart. The prospective crossmatch using neat serum was T-cell moderate positive and B-cell weak positive. The 1:8 serum yielded negative T and B cell crossmatch results. The heart was accepted and post transplant desensitization was performed.

Surrogate Crossmatches

A3			
Serum Date	Method	Result	A3 DSA MFI
19 Days before TX	T cell Flow pronase	Moderate Pos	13,719
	B cell Flow pronase	Weak Pos	
	T cell Flow 1:8 pronase	NEG	3,139
	B cell Flow 1:8 pronase	NEG	
B7			
Serum Date	Method	Result	B7 DSA MFI
19 Days before TX	T cell Flow pronase	Strong Pos	17,716
	B cell Flow pronase	Strong Pos	
	T cell Flow 1:8 pronase	Strong Pos	14,282
	B cell Flow 1:8 pronase	Moderate Pos	

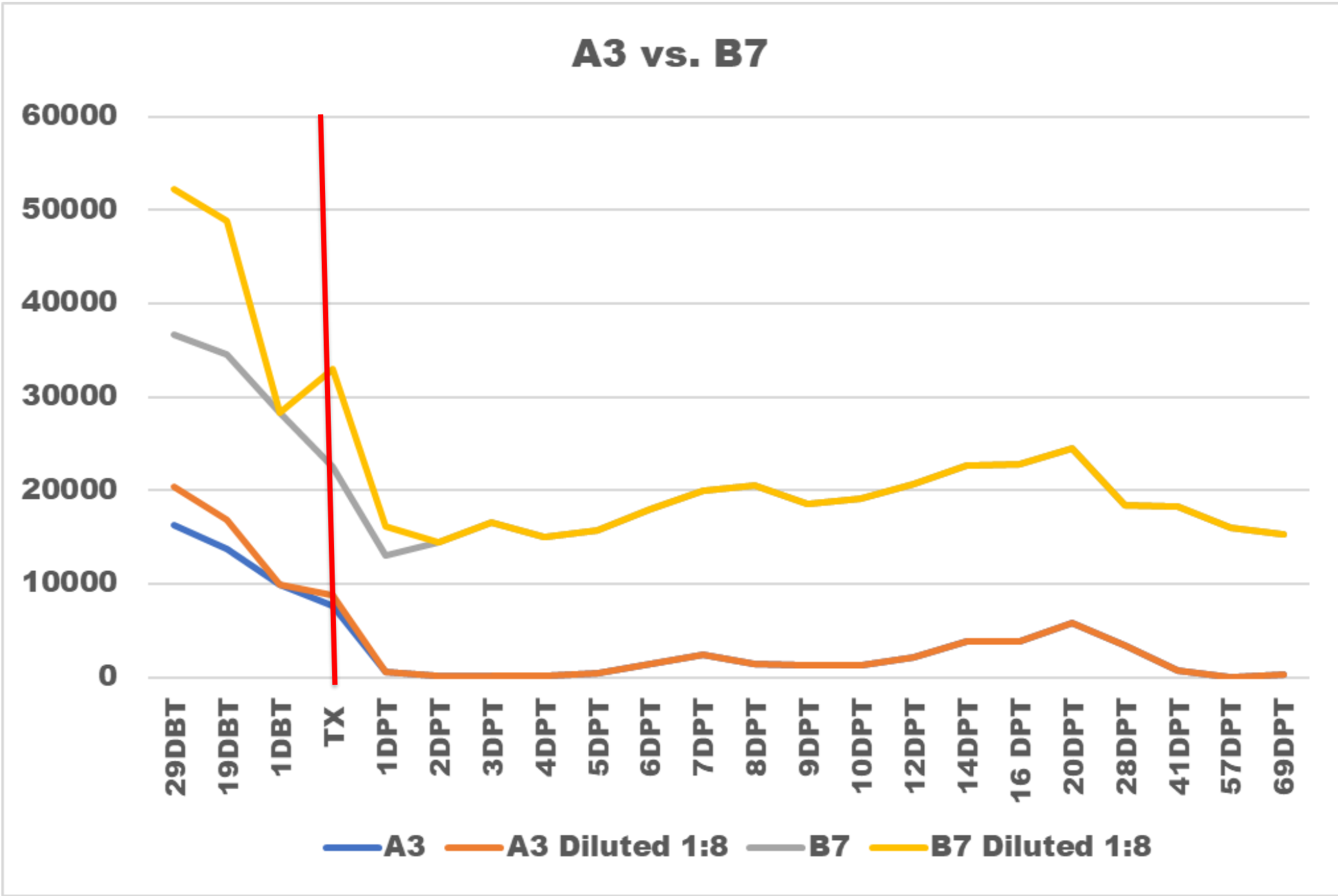
A3+ Heart Pre Transplant Crossmatch

Serum Date	Method	Result	DSA
Day of TX (0)	T cell Flow pronase	Mod Pos	MFI A3 = 7,663
	B cell Flow pronase	Weak Pos	
	T cell Flow 1:8 pronase	Negative	MFI A3 = 1174
	B cell Flow 1:8 pronase	Negative	

Post Transplant Desensitization Scheme

HDPRA			
Post Transplant (Days)	Desensitization Treatment	A3 (MFI)	B7 (MFI)
-1	N/A	178	14,726
0	Double Volume Plasma Exchange, Eculizumab	590	12,402
1	ATG, Apheresis, IVIG, Steroid	124	17,623
2	ATG, Apheresis, Steroid	2	16,364
3	ATG, Apheresis, IVIG	189	14,825
4	ATG, Apheresis	430	15,362
5	ATG, Apheresis, Eculizumab	1,449	16,601
7	Steroid	1,459	19,057
11	Bortezomib	2,122	18,578
119	Monthly IVIG	178	14,726

Single Antigen MFI’s Before & After Transplant



A3 demonstrates the effectiveness of desensitization while B7 demonstrates that not all antibodies can be desensitized.

A3+ Heart Post Transplant Crossmatch

Serum Date	Method	Result	DSA
Day after TX (1)	T cell Flow pronase	Negative	A3 MFI = 590
	B cell Flow pronase	Negative	

Conclusions

Titration helped this high CPRA patient by identifying an antibody reactivity that was likely to respond to desensitization treatments.

Testing serum samples at a 1:8 dilution by flow crossmatch is used in our lab to predict antibody reduction that will produce T and B cell negative crossmatches after desensitization.

These protocols can help predict the likelihood of desensitization to reduce antibody reactivity, open the donor pool and result in a successful transplant.