39-YEAR-OLD POSTPARTUM G3P2 HEART TRANSPLANT PATIENT WITH RAPID ANTIBODY RESPONSE

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Introduction

A pregnant 39 y/o patient was induced at 38 weeks due to chronic hypertension (HTN). Patient and baby were discharged on postpartum day 2 (PP2).

On PP8, patient presented with HTN and lower extremity swelling. Following admission, a left main coronary artery dissection was discovered. Immediate medical treatment was conducted, and patient was listed for orthotopic heart transplant (OHT) upon completion of HLA typing/PRA (PP11). Patient's PP11 PRA had weak class II reactivity only (MFIs <1400; CPRA = 0).

At listing (PP13), patient had received 4 units of RBCs over the previous 2 days.

A prospective crossmatch was performed with PP11 and PP16 sera. The results showed PP11 serum was T and B cell negative, while PP16 serum was T and B cell weak positive. The positive crossmatch was unexpected since there was no DSA on the PP11 PRA listing sample.

Patient received OHT on PP17 with the positively crossmatched donor.

On PP18 (PO 1), a retrospective crossmatch was performed to confirm the positive crossmatch, using all sera on hand. Again, the PP11 sera was negative, PP16 was weak positive, and the PP18 sera showed B cell moderate positive reactivity. PRAs performed this same day confirmed that by PP16 and PP18, the patient had rapidly developed antibodies, and now showed strong DSA to the heart donor. The patient has another child with a different father. HLA typing from her oldest child and father of this baby were performed to investigate origin of the rapid antibody response.

PP, postpartum; PO, post-operative

Mismatched Antigens

Recipient HLA Typing: A*23, A*23, B*08, B*35, C*04, C*07, DRB1*04, DRB1*11, DRB3*02, DRB4*01, DQA1*03, DQA1*05, DQB1*03, DQB1*03

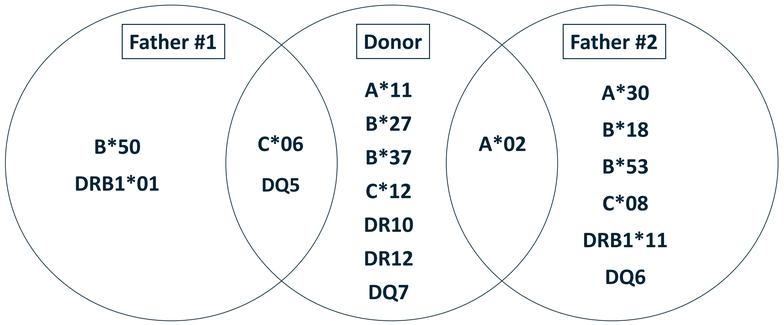

Figure 1. Diagram shows mismatched antigens to the heart recipient from the donor and fathers of her children. Although we do not have the full haplotype of father #1 (HLA typing was collected from oldest child), we used this information to infer where the antibody response to the heart may have originated.

DSA MFIs Over Time

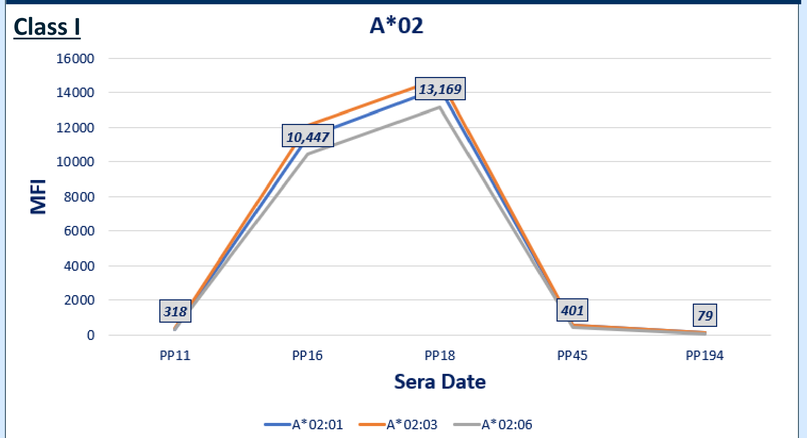

Figure 2 (above). This graph shows DSA to all 3 A*02 alleles represented on the One Lamda single antigen panel. Both the donor and father #2 have one of the A*02 alleles. The MFI values shown are the A*02:06 DSA from the donor.

The other Class I antigen shared between the donor and a previous father of her child was C*06. This allele was negative on all PRAs and this remained constant through pre and post transplant.

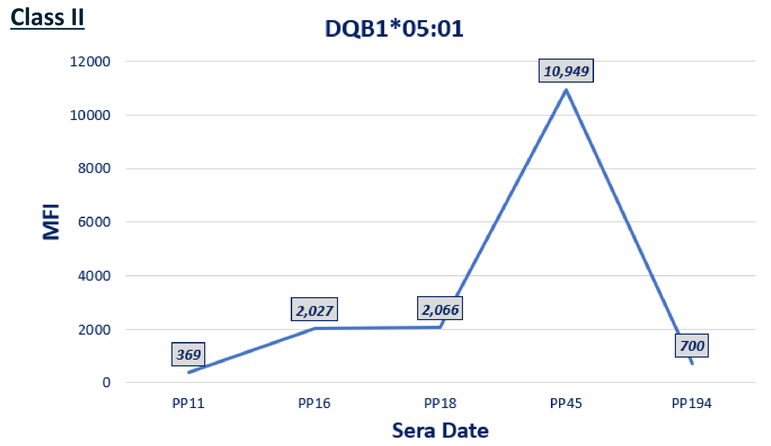

Figure 3 (above). This graph shows DSA to DQB1*05:01, which is a shared allele between the donor and father #1. This allele, if a memory response, took longer to increase in MFI value than A2, however also responded to treatment by day PP194.

Post Transplant Care

The initial workup sample (PP11) was collected less than 14 days after childbirth, ECMO, and transfusions. By PP16, she had developed strong antibodies as a result of these sensitizing events.

Post Transplant Treatment

PP16
- Mycophenolate IV

PP20 (PO 2)
- Started daily prednisone
- Tacrolimus
- 4 rounds of Thymoglobulin to prevent antibody-mediated rejection

Virtual XM Post TX

Sera Dates	T Cell	B Cell
PP45 (PO 28)	Weak/Moderate Positive	Strong Positive
PP194 (PO 177)	Negative	Negative

PP, postpartum; PO, post-operative

Table 1. Although post transplant crossmatches were not performed, we did a virtual crossmatch using post transplant PRAs. DSA to B*27 and DQ5 were still present on the PP45 sample, but both alleles had decreased to negative by PP194.

Conclusions

- Both fathers have shared antigens with the heart donor, which may explain the rapid increase in DSA two weeks postpartum. Antibodies showed up on her PRA around 2 weeks postpartum, which was also around the time she got transplanted (PP18)
- The class I DSA decreased by PP45 (PO 28), potentially due to the post transplant treatment, and class II DSA didn't decrease until PP194 (PO 177)
- The sample sent PP194 (PO 177) showed all class I and II DSA had fully resolved
- This case highlights that transplantation in close proximity to sensitizing events could be problematic
- Caution should be used when transplanting patients who are within one month postpartum