Rh typing Discrepancy

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American Red Cross IRL
Southern Region
Feel like this donkey.....
Patient History

- Sample referred to IRL for resolution of positive antibody screen and positive DAT; crossmatch for 2 units requested.
- Patient is 46 y/o female scheduled for hysterectomy. History of previous transfusion with rbcs 5 months ago.
- Hospital types the patient as O Rh neg.
**IRL Initial ABO/Rh and DAT Results**

<table>
<thead>
<tr>
<th></th>
<th>Anti-A</th>
<th>Anti-B</th>
<th>Anti-D (IS)</th>
<th>Rh control (IS)</th>
<th>A₁ cells</th>
<th>B cells</th>
<th>DAT Poly AHG</th>
<th>DAT Anti-IgG</th>
<th>DAT Anti-C3</th>
</tr>
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<tbody>
<tr>
<td>Patient</td>
<td>0</td>
<td>0</td>
<td>4+</td>
<td>0</td>
<td>4+</td>
<td>4+</td>
<td>w+</td>
<td>w+</td>
<td>✔</td>
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An unexpected discrepancy
How is this possible?

- Called Blood Bank to double-check Rh type. Blood Bank confirmed that patient typed as Rh negative, but:
  - They do not perform test for weak D antigen ("Du test")
  - Anti-D from a different manufacturer was used for testing
# IRL Initial ABO/Rh and DAT Results

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## Additional Rh testing

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<tr>
<td></td>
<td>IS</td>
<td>37</td>
</tr>
<tr>
<td>Manuf #1</td>
<td>4+</td>
<td>NT</td>
</tr>
<tr>
<td>Manuf #2*</td>
<td>0</td>
<td>+w</td>
</tr>
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</table>

*Patient’s rbcs were treated with EDTA Glycine-Acid (EGA) to remove IgG prior to testing.*
Anti-D testing

Our testing demonstrated that patient is D positive, but why are the results so different?

- Weak D (or “Du pos”) was originally described in 1946 to describe D antigens that were detected only by IAT testing.
- With the strong monoclonal anti-D reagents we have now, many red cells previously described as weak D show strong, direct agglutination with these reagents.
- Some partial D phenotypes (such as Cat VI) still require IAT testing for detection of D.
- Weak D testing is not required for patient testing.
Anti-D reagents used

- Manufacturer #1 anti-D is a monoclonal blend with an IgM component (cell line GAMA401) and an IgG component (cell line F8D8).
  - Per MI, it is expected to be reactive @ IS with weak D and some partial D rbcs, except those from Cat VI (reactive at IAT only).

- Manufacturer #2 anti-D is a human monoclonal-polyclonal blend prepared from human monoclonal IgM anti-D and human IgG anti-D, plus a monoclonal IgM component (cell line MAD2).
  - Per MI, it is expected to react with weak D and partial D rbcs by the IAT test, and may occasionally react directly with weak D rbcs.
“Which reagent is best?”

It depends on your testing needs:

Pros:
Reagent #1 will detect weak D and most partial D antigens readily and reduce the amount of Rh negative products used unnecessarily.

Cons:
Rare Partial D individuals at risk for anti-D production may be transfused with Rh positive red cells and may develop anti-D.
“Which reagent is best?”

Other considerations:

- Use of reagent #2 for young females and women of child-bearing age may be advantageous, as these patients will be considered Rh negative for transfusion and RhIG evaluation.

- Red cells identified as potential “weak D” or “partial D” can also be tested using the ALBAclone Partial RhD typing kit to help determine risk for D alloimmunization.
Summary

- Patient is D positive.
  - Warm-reactive autoantibody with anti-E and anti-Fy^a.
- Rh negative products provided as requested.
- If regular transfusion becomes necessary for this patient, testing for partial D antigen might be helpful in determining if allo anti-D would be produced.
Stay tuned!