Troubleshooting the Incompatible Crossmatch
Trouble Shooting the Incompatible Crossmatch

Immediate Spin

Non-Immune Causes

Fibrin
Rouleaux
Fibrin

- Is a protein involved in the clotting of blood
- Appears in plasma samples that either have been improperly mixed and/or aged
- Can give the appearance of agglutination in the test tube
An Immediate Spin Crossmatch with Fibrin
How to Remove Fibrin

Plasma with Fibrin

Plasma post centrifugation with fibrin plug at bottom of tube
Repeated Immediate Spin Crossmatch
Rouleaux

- Caused by an excess of protein in the patient’s plasma
- If present, it should first be detected in the reverse grouping of non-group O patients
- Should react with all units tested, including the A1 and B cells
- Will disperse with saline replacement
Troubleshooting the Incompatible Crossmatch

Immediate Spin

Non-Immune Causes
- Fibrin
- Rouleaux

Immune Causes
- Non-Specific Cold Agglutinin
- Cold Agglutinin with Specificity
Non-Specific Cold Agglutinin

• Should have first been detected in the reverse grouping of non-group O patients

• Should react with all donor units tested, including the A1 and B cells

• Often caused by performing a xm with cold plasma
Cold Antibody with Specificity

- Reacts with some of the units, possibly with varying strengths
- May not have been detected in the grouping or in the antibody screen
- Could be an anti-P1, -Lua, -Lea, -Leb, -M
**How to Investigate a Cold Reacting Antibody in the Crossmatch**

Using an anti-P1 as an example

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### Panel for Investigating Cold Antibodies

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Weakly Incompatible Units by AHG

Non-Immune Causes

Dirty Saline Bottle
Dirty Cell Washer
Clotted Segments
Too small cell buttons

Rouleaux
Fibrin
Antibody/Fibrin/Negative at 37°C
Gliat XM with Fibrin
Weakly Incompatible Units by AHG

Non-Immune Causes
- Dirty Saline Bottle
- Dirty Cell Washer
- Clotted Segment
- Too small cell buttons

Immune Causes
- Passive ABO Antibody
- New Alloantibody

Rouleaux

Fibrin
Passive ABO Antibodies

- Will occur in non-group O patients only

- Patient has recent transfusion history of either IVIgG or ABO mismatched platelets or mismatched solid organ transplant

- Possible positive DAT and eluate that reacts against A1 and B cells

- Give group O blood until antibody disappears
New Alloantibody

• Some of the units are reacting with varying strengths

• Patient may have a positive DAT

• Will require an antibody investigation

• May cause a delay in providing blood if antigen negative units need to be sourced
AHG XM with a Strongly Incompatible Unit
Antibody to Low Frequency Antigen

- Perform a direct antiglobulin test on the unit
- Recheck the antigen typing on the unit
- Review the antibody investigation, paying particular attention to the exclusions
- If the exclusions are valid, give antigen-negative, crossmatch compatible blood
Summary

• There are immune and non-immune reasons for incompatibility in a crossmatch

• Consider passive ABO antibodies when problem solving the incompatible crossmatch in non-group O patients

• One strongly incompatible unit in a crossmatch is probably due to an antibody to a low frequency antigen

• Consult with the Medical Director/patient’s physician before issuing incompatible blood
Acknowledgements

Dr Jacob Pendergrast
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Scott Lambie
Thank You

Questions ?