Immunohematology Case Studies Blood Group Discrepancies 2017 - 4

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Clinical History

1 year old female patient diagnosed as congenital diaphragmatic hernia for surgical procedure.

Request for 1 unit PRBC received in blood bank.

Serologic Work up

Blood grouping both CELL and SERUM done by tube method as per departmental SOP.

ABO/Rh:

Anti- A	Anti- B	Anti- D	Anti- AB	A cell	B cell	O cell	Auto control
4 +	4 +	3 +	4 +	3 +	0	0	0

As cell and serum grouping results don't match it is a blood group discrepancy.

Serologic Work up

Extended blood grouping done by tube method

Anti-A	Anti-B	Anti-D	Anti-AB	Anti-A1	Anti-H
4+	4+	3+	4+	0	2+

Serum grouping	Immediate Spin (IS)	Room Temperature (RT)	Anti Human Globulin (AHG)
A cell	3+	3+	2+
B cell	0	0	0
O cell	0	0	0
Auto control	0	0	0

Preliminary Blood group: A_2B RhD positive with Anti-A1

Current Sample Presentation Data

DAT: 2+ by gel technology (Bio-Rad)

Antibody Screen Method: Bio-Rad 3 cell panel

Antibody Screen Results:

SCREEN I	SCREEN II	SCREEN III	AUTO	DAT
0	0	0	1+	2+

Challenge with the Current Presentation

There are a few challenges in this current presentation which need to be solved:

1. As cell and serum blood groupings do not match;

   Possibility of A_2B with Anti-A_1

   But Anti-A_1 detected in serum grouping needs to be confirmed.

2. DAT and autocontrol are positive in gel, though autocontrol is negative in tube testing in AHG phase.

Possible Answers and Next Steps

Anti-A1 in patients sample confirmed by:

1. Reactivity of patient's serum with A_1 and A_2 cells. Of note, the number of reagent cells to be tested to confirm anti-A1 may depend on the country
2. Titration of anti-A1 in patients sample using A_1 cells
3. DTT treatment of patients serum and reactivity with A_1 cells

Further Work

1. Reactivity of patient serum with A_1 and A_2 cells

	Tube testing		Gel testing	
	IS	**AHG**	**Neutral card**	**LISS-COOMBS AHG card**
A_1 cells	3+	2+	2+	0
A_2 cells	0	0	0	0

Interpretation: Presence of anti-A1

Further Work

2. Titration of anti-A1 in patient's sample using A_1 cells

Titration with A_1 cells		
	IgM (Room Temp)	**IgG (AHG)**
Titres	4	1

Interpretation: Anti-A1 has reactivity mainly in IgM phase with titre of 4

Further Work

3. DTT treatment of patients serum and reactivity with A_1 cells

DTT treatment (Gel Method)		
	Neutral card	**LISS-COOMBS AHG card**
A1 cells	0	0

Interpretation: Anti-A1 is of IgM type with reactivity destroyed after DTT treatment.

Updated Clinical Information

No significant history of drug intake

No history of any previous blood transfusion

Further Testing Results and Interpretations

DAT testing:

DAT		
Anti-IgG	**Anti-IgM**	**Anti-C3d**
2+	Neg	Neg

DAT is IgG type but no significant correlation found with patient history.

Conclusions

Final Blood Group:

A_2B with anti-A1

Summary of Case Challenges

1. Anti-A1 confirmation
2. Titration of antibody
3. DTT treatment of serum
4. DAT positivity and differential DAT interpretation

Lessons Learned by the Case

1. Cell grouping and Serum grouping must be performed by Tube method or Gel Method

2. Serum grouping step is very important in blood group confirmation and cell and serum grouping results must correlate.

3. Final blood group interpretation in case of a discrepancy requires non routine reagents and methods like Anti-A1, Anti-H, reactivity with A1 & A2 red cells, Titration & DTT treatment procedures.