



Immunohematology Case Studies 2017 – 8

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Clinical History



- Patient presents Jan 2011. Diagnosis: Pre-op
- March 2011. Diagnosis: Bleeding from rectum.
- June 2014. Diagnosis: Anaemia
- January 2015. Diagnosis: Chronic Myelo-Monocytic Leukaemia

Serologic History



- Jan 2011 Group O Positive, no irregular antibodies, 4 RBC units ordered
- March 2011: 2 RBC units ordered. Blood Bank screen positive (one out of three cells) on Autovue (automated microcolumn assay). 2 out of 26 units on Autovue are compatible and issued.
- Sample referred to IRL

Routine methods utilized in Reference Lab



Antibody Screen Method:

Column Agglutination Technique in IAT and enzyme
Manual Saline tube and AHG method

Antibody Identification Method:

Column agglutination technique in IAT and enzyme
Manual saline tube and AHG method

March 2011



- In Reference Lab Antibody screen positive in enzyme and AHG (one out of three cells), using Serascan on Grifols WaDiana

Serascan Diana 3/Serascan Diana 3P

Antigens table/Tabla de antígenos/Tabela de antígenos/Πίνακας αντιγόνων/Antigenní tabulka/Antigénná tabuľka/Antigén táblázat /Tabela antygenów

ID	Donor/Donante/ Dátaš/dámc/ Dáite/Darce/ Dawca	Rh Phenotype/Termino RH/ Seroforma RH/ Fenotyp RH/RH fenotipus	Rh-ir					Kell					Duffy		Kidd		Lewis		P					MNS					Luth.			Xg	Special antigens/Grupos especiais Antígenos especiais Grupos especiais Véteľ antigény/Grupos especiales Antígenos especiais	Results/Resultados/Αποτελέσματα/ Výsledky/Eredmények/Wyniki		
			D	C	E	c	e	C*	K	k	Kp*	Kp*	Js*	Js*	Fy*	Fy*	Jk*	Jk*	Le*	Le*	P ₁	M	N	S	s	Lu*	Lu*	Xg*	AHG	ELT						
I	3288275	CCDee R ₁ R ₁	+	+	0	0	+	0	0	+	0	+	nt	+	0	+	+	0	0	+	0	0	+	+	+	+	0	+	+			I	⊙	⊙		
II	0383670	ccDEE R ₂ R ₂	+	0	+	+	0	0	0	+	0	+	nt	+	+	0	0	+	0	+	+	+	+	0	+	0	0	+	0			II	⊙	⊙		
III	0206827	ccddee rr	0	0	0	+	+	0	+	+	0	+	nt	+	+	0	0	+	+	0	+	+	+	0	+	0	+	+			III	+	+			
																																		⊙	/	

Antibody unidentified with identsera Diana in enzyme and AHG media

Identisera Diana/Extend-Identisera Diana P/Extend P

Antigens table/Tabla de antígenos/Tabela de antígenios/Πίνακας αντιγόνων/Antigenni tabulka/Antigéná tabul'ka/Antigén táblázat /Tabela antygenów/Антигенный профиль пане

	Donor/Donante/ Dátor/Dátnic/ Dáveca/dávep	Rh Phenotype/Fenotipo Rh/ Φαινότυπος Rh/ Fenotip Rh/Rh fenotipus/ Rh-fenotipon	Rh-ir					Kell					Duffy		Kidd		Lewis		P					MNS		Luth.		Xg	Special antigens/antígenos especiales/ Antígenos especiais/ Special antigens/ Külsejtes antigének/Przyjmowane specjalne antygeny	Results/Resultados/Am/ Výsledky/Ergebnis/ Wyniki/Przykaza					
			D	C	E	c	e	C*	K	k	Kp*	Kp*	Js*	Js*	Fy*	Fy*	Jk*	Jk*	Le*	Le*	P ₁	M	N	S	s	Lu*	Lu*			Xg*	AHG	Enz			
1	3703698	CCDee R ₁ R ₁	+	+	0	0	+	0	+	+	0	+	nt	+	0	+	+	0	0	+	0	+	+	0	+	0	+	+	+	+			1	0	0
2	3099943	Ccdee r'r	0	+	0	+	+	0	0	+	0	+	nt	+	0	+	+	0	0	+	+	0	+	0	+	0	+	0	+	+			2	+	0
3	3364029	ccDee R ₀ r	+	0	0	+	+	0	0	+	0	+	nt	+	+	0	0	+	0	0	+	+	0	+	0	0	+	0	+			3	+	0	
4	4156478	ccddEe r'r	0	0	+	+	+	0	0	+	0	+	nt	+	0	+	0	+	0	+	+	+	0	+	0	0	+	+				4	+	0	
5	4077599	ccDEE R ₂ R ₂	+	0	+	+	0	0	0	+	0	+	nt	+	+	0	+	0	0	+	+	0	+	0	+	0	+	0	+			5	+	0	
6	3691669	C ^w CDee R ₁ ^w R ₁	+	+	0	0	+	+	0	+	0	+	nt	+	0	+	0	+	0	+	+	+	+	+	0	0	+	+	Co ^b			6	+	0	
7	0089696	ccddee rr	0	0	0	+	+	0	+	+	0	+	nt	+	+	0	0	+	0	+	+	+	+	+	+	0	+	+			7	+	0		
8	0292740	ccddee rr	0	0	0	+	+	0	0	+	0	+	nt	+	0	+	0	+	+	0	+	+	0	0	+	0	+	0	+			8	+	0	
9	3347317	ccddee rr	0	0	0	+	+	0	0	+	0	+	nt	+	0	+	0	0	+	+	+	0	+	0	0	+	0	+			9	+	0		
10	3658232	ccddee rr	0	0	0	+	+	0	0	+	0	+	nt	+	+	0	+	0	0	+	+	0	+	0	+	+	+				10	+	0		
11	3341812	CCDee R ₁ R ₁	+	+	0	0	+	0	0	+	+	+	nt	+	+	0	0	+	+	0	+	+	0	+	+	0	+	+			11	+	0		

June 2014



- June 2014: Serascan AHG positive, enzyme negative
- This is different to the way the patient presented before – now it seems as if the antibody is destroyed in enzyme medium
- Antibody still unidentified in AHG medium. An antibody outside of the panel cells is suspected
- 3 RBC units requested

IDENTISERA DIANA/EXTEND-IDENTISERA DIANA P/EXTEND P

Antigens table/Tabla de antígenos/Tabela de antígenos/Πινακας αντιγόνων/Antigenní tabulka/Antigenná tabul'ka/Antigén táblázat /Tabela antygenów/Антигенный профиль панели

	Donor/Donatore/ Dador/Dótor/ Dance/Dance/ Dawca/dawca	Rh Phenotype/Fenotipo Rh/ φαινότυπος Rh/ Fenotyp Rh/Rh fenotipus/ Rh-φαινότυπ	Rh-ir					Kell					Duffy		Kidd		Lewis		P		MNS					Luth.		Xg ^a	Special antigens/Antígenos especiais Antígenos especiais Especiales Yüksek antigenlikte antigenler Специальные агенты	Results/Resultados/Αποτελέσματα/ Výsledky/Ergebnisse/ Wyniki/Результаты				
			D	C	E	c	e	C*	K	k	Kp ^a	Kp ^b	Js ^a	Js ^b	Fy ^a	Fy ^b	Jk ^a	Jk ^b	Le ^a	Le ^b	P ₁	M	N	S	s	Lu ^a	Lu ^b			Xg ^a	ANG			
1	4465038	CCDee R ₁ R ₁	+	+	0	0	+	0	+	+	0	+	nt	+	0	+	0	+	0	+	0	+	0	0	+	0	+	+		1	1+			
2	4218028	Ccdee r'r	0	+	0	+	+	0	0	+	0	+	nt	+	+	0	+	+	0	+	0	+	+	0	+	+	+	0	2	0				
3	2571504	ccDee R ₀ r	+	0	0	+	+	0	0	+	0	+	0	+	0	+	0	+	+	+	+	0	+	0	0	+	0	3	0					
4	4299024	ccddEe r'r	0	0	+	+	+	0	0	+	0	+	nt	+	0	+	+	0	0	+	+	+	0	+	+	0	+	4	1+					
5	3458678	ccDEE R ₂ R ₂	+	0	+	+	0	0	0	+	+	+	nt	+	+	+	0	+	0	+	0	+	0	0	+	0	+	5	1+					
6	4487195	C ^w CDee R ₁ ^w R ₁	+	+	0	0	+	+	0	+	0	+	nt	+	+	+	+	0	+	0	+	+	+	+	+	0	+	6	0					
7	4286466	ccdee rr	0	0	0	+	+	0	+	+	0	+	nt	+	+	0	+	0	0	+	+	0	+	0	+	0	+	7	0					
8	3441920	ccdee rr	0	0	0	+	+	0	0	+	0	+	0	+	0	+	+	0	+	+	+	+	+	0	+	0	+	8	0					
9	3556545	ccdee rr	0	0	0	+	+	0	0	+	0	+	nt	+	+	0	0	+	0	0	+	+	+	+	0	0	+	9	+					
10	3542729	ccdee rr	0	0	0	+	+	0	0	+	0	+	nt	+	+	0	0	+	+	+	+	+	+	0	0	+	+	10	0					
11	2474282	CCDee R ₁ R ₁	+	+	0	0	+	0	0	+	0	+	nt	+	0	+	+	0	0	+	0	0	+	0	0	+	0	11	0					

December 2014



- December 2014: Serascan AHG and enzyme pos, Identsera Diana pos in AHG and enzyme, still unidentified
- Now the antibody is presenting in enzyme again!
- Anti-S suspected in AHG, but later excluded.

January 2015



- Jan 2015: Serascan AHG and enzyme pos, possible anti-Fyb + unidentified Ab? Patient types weakly positive for Fy^b – transfused cells expected...but anti-Fy^b excluded
- Leukaemia diagnosis makes us think about antibodies with HTLV-like characteristics?
- Finally able to perform genotyping

Interim Antibody Identification Possible Answers and Next Steps



- May 2015: IDCore^{XT} genotyping platform: prediction of a rare k neg type!!...is this a possible anti-k + an unidentified antibody?
- Sept 2015: sent to IBGRL to investigate as some k neg donors are now crossmatching incompatible
- Interim treatment k negative units that cross match compatible

Challenge with the Current Presentation



- The antibody screen was positive in IAT and in enzyme.
- The Ab looked like an anti-Fy^b in AHG phase and unidentified in enzyme
- The patient typed Fy^b positive, so anti-Fy^b was discounted
- Treatment k neg, (to prevent allo-immunization)
- Had few k neg donors
- By Aug 2015 some k neg donors crossmatch incompatible
- Increased effort to test for more k negative donors

Further work



- 2015 – 2016: 662 known K pos donors are serologically typed for k
- 17 new k neg rare donors identified
- Referred patient sample to IBGRL: Anti-Ch (CH/RG1) and a non-specific papain autoantibody is identified. Anti-Fy^b and anti-S are excluded

Brief Review of the Blood Group System Chido/Rodgers



- Not true blood group antigens (passively adsorbed onto the RBC membrane)
- Located on a fragment of C4B
- Destroyed by enzymes
- Anti-Ch does not cause HTR or HDFN
- Antigen neg blood not required for transfusion
- Antibodies are generally IgG
- Detection requires IAT

Summary of Case Challenges



- Insufficient patient samples received
- Patient attended different hospitals. Records not linked at first
- Treatment k neg blood to prevent alloimmunisation
- Not enough k neg donors
- Genotyping device not always available
- Very expensive to send samples to IBGRL - as much as a plane ticket (from Cape Town!)

Lessons Learned by the Case



- Perform extended typing and genotyping sooner on patients with unidentified antibodies
- Update records on each case presentation fully. Redesign computing form to include a section with all previous records visible on one page
- Patient received 16 k positive units over a 4 year period, no anti-k was produced – possibly due to immunosuppression caused by chemotherapy?