Immunohematology Case Studies 2016 - #4

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Clinical History

A 27 year/ Female

Full term pregnancy

Admitted in Maternity hospital with abdominal pain & bleeding Per Vagina

Afebrile

Pallor, edema ++

PR: 110/min

BP: 90/60 mm Hg

Further History

No history of Blood transfusion

Obstetric history: Gravida 2 para 1 abortion 0

Hb: 7.4 gm%

Platelet count: 280000/ cmm

Total count: 7600/cmm

OBGY dept requested two units of packed red cell for transfusion

Current Sample Presentation Data

ABO/Rh: B Positive

DAT: Negative

Antibody Screen Method: Column agglutination

Antibody Screen Results: Positive

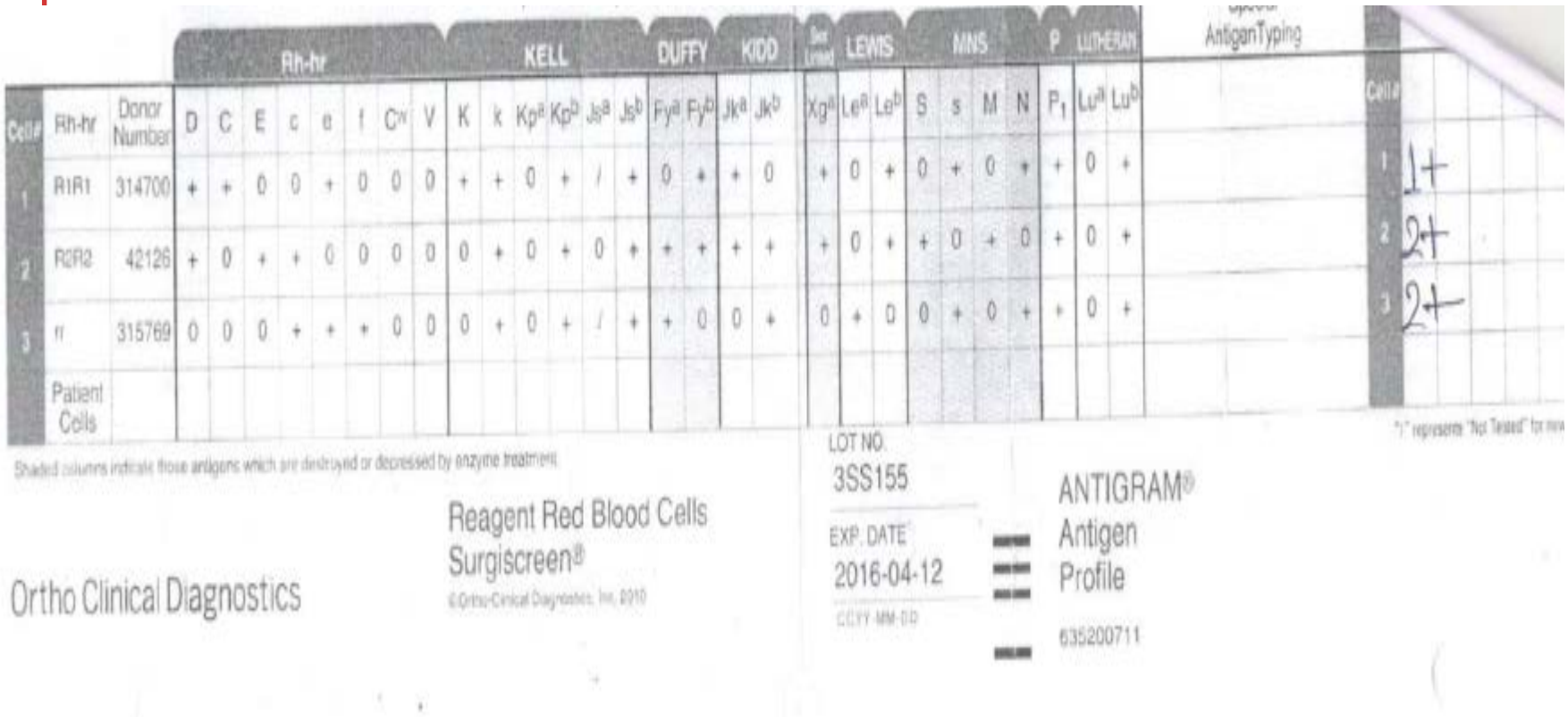
Antibody Identification Method: Column agglutination

Antibody Identification Preliminary Results: Positive

Challenge with the Current Presentation

- As common practice in India ABO & Rh typing & Cross match is performed as pre transfusion testing
- Antibody screening is not performed routinely at most of the blood banks in India
- Blood typing & cross match was done by Column agglutination technique
- About 10 cross matches were done but found none of the units compatible
- Selecting red cell for the bleeding pt became challenge
- Antibody detection was started

Panel Sample: Antibody screening



			Rh-hr								KELL						DUFFY		KIDD		Sex Linked	LEWIS		MNS			P	LUTHERAN		Cell #
Cell #	Rh-hr	Donor Number	D	C	E	c	e	f	C^w	V	K	k	Kp^a	Kp^b	Js^a	Js^b	Fy^a	Fy^b	Jk^a	Jk^b	Xg^a	Le^a	Le^b	S	s	M	N	P_1	Lu^a	Lu^b	
1	R1R1	314700	+	+	0	0	+	0	0	0	+	+	0	+	/	+	0	+	+	0	+	0	+	0	+	0	+	+	0	+	1+
2	R2R2	42126	+	0	+	+	0	0	0	0	0	+	0	+	0	+	+	+	+	+	+	0	+	+	0	+	0	+	0	+	2+
3	rr	315769	0	0	0	+	+	+	0	0	0	+	0	+	/	+	+	0	0	+	0	+	0	0	+	0	+	+	0	+	2+
	Patient Cells																														

Shaded columns indicate those antigens which are destroyed or decreased by enzyme treatment.

Antigen Typing

"/" represents "Not Tested" for

Ortho Clinical Diagnostics

Reagent Red Blood Cells
Surgiscreen®

©Ortho-Clinical Diagnostics, Inc. 2010

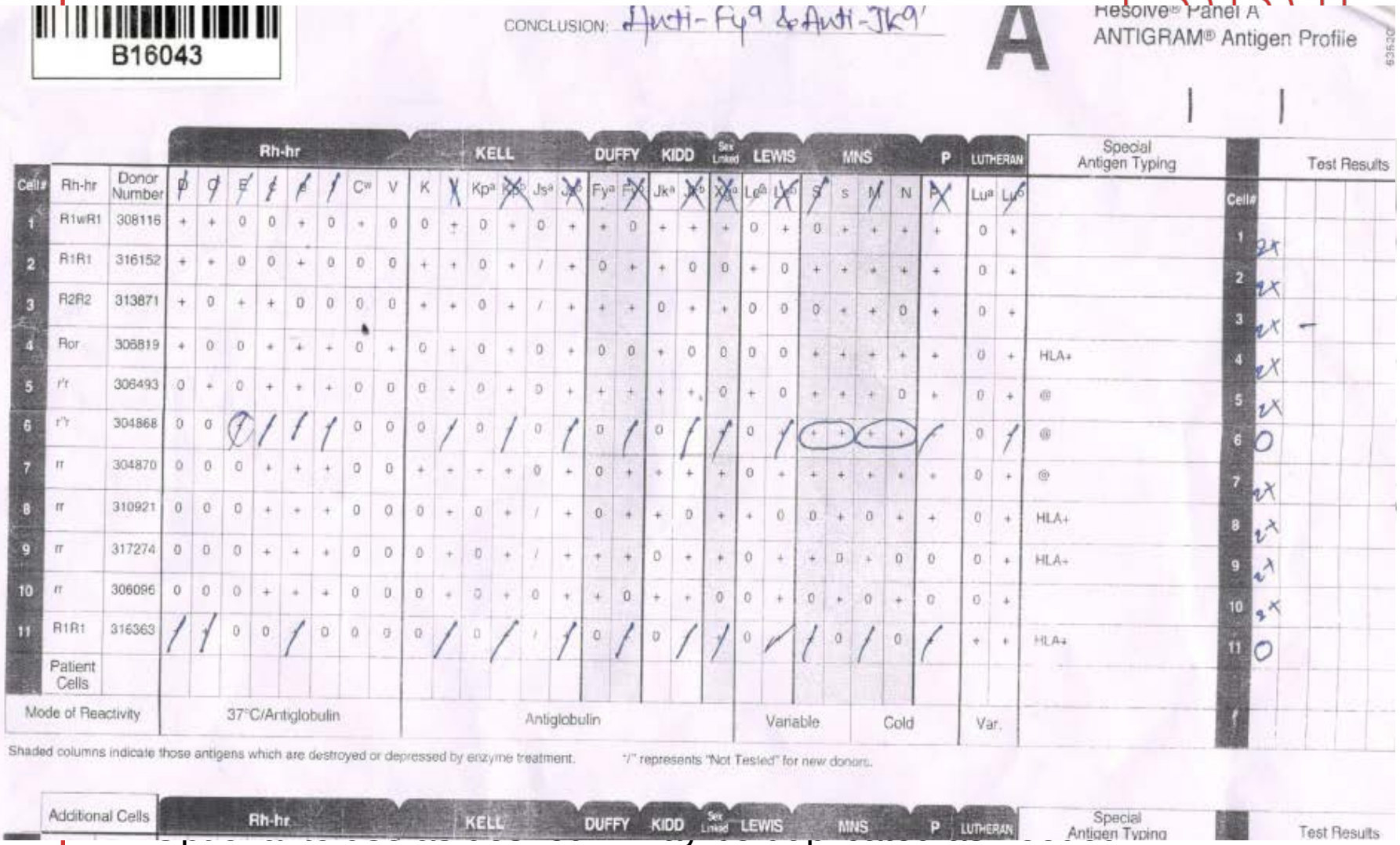
LOT NO.
3SS155

EXP. DATE
2016-04-12
CCYY MM DD

ANTIGRAM®
Antigen
Profile

635200711

Panel Sample: Identification



B16043

CONCLUSION: Anti-Fy^a & Anti-Jk^a

A

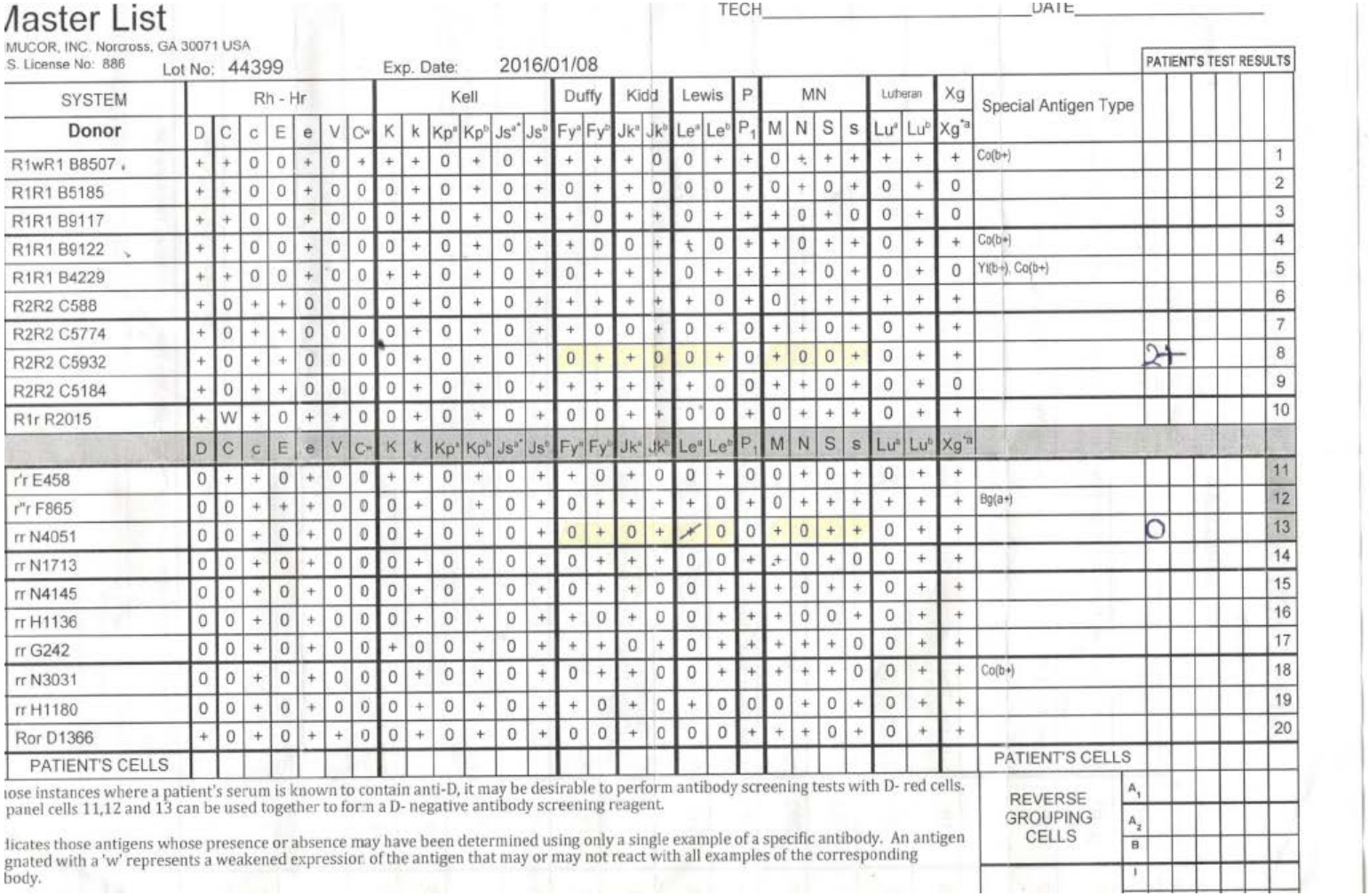
Resolve® Panel A
ANTIGRAM® Antigen Profile

Cell #	Rh-hr	Donor Number	D	C	E	c	e	f	C^w	V	K	k	Kp^a	Kp^b	Js^a	Js^b	Fy^a	Fy^b	Jk^a	Jk^b	Xg^a	Le^a	Le^b	S	s	M	N	P	Lu^a	Lu^b	Special Antigen Typing	Test Results
1	R1wR1	308116	+	+	0	0	+	0	+	0	0	+	0	+	0	+	+	0	+	+	+	0	+	0	+	+	+	+	0	+		2+
2	R1R1	316152	+	+	0	0	+	0	0	0	+	+	0	+	/	+	0	+	+	0	0	+	0	+	+	+	+	+	0	+		4+
3	R2R2	313871	+	0	+	+	0	0	0	0	+	+	0	+	/	+	+	+	0	+	+	0	0	0	+	+	0	+	0	+		2+ –
4	Ror	306819	+	0	0	+	+	+	0	+	0	+	0	+	0	+	0	0	+	0	0	0	0	+	+	+	+	+	0	+	HLA+	4+
5	r'r	306493	0	+	0	+	+	+	0	0	0	+	0	+	0	+	+	+	+	+	0	+	0	+	+	+	0	+	0	+	@	2+
6	r''r	304868	0	0	/	/	/	/	0	0	0	/	0	/	0	/	0	/	0	/	/	0	/	+	+	+	+	/	0	/	@	0
7	rr	304870	0	0	0	+	+	+	0	0	+	+	+	+	0	+	0	+	+	+	+	0	+	+	+	+	+	+	0	+	@	2+
8	rr	310921	0	0	0	+	+	+	0	0	0	+	0	+	/	+	0	+	+	0	+	+	0	0	+	0	+	+	0	+	HLA+	2+
9	rr	317274	0	0	0	+	+	+	0	0	0	+	0	+	/	+	+	+	0	+	+	0	+	+	0	+	0	0	0	+	HLA+	2+
10	rr	306096	0	0	0	+	+	+	0	0	0	+	0	+	0	+	+	0	+	+	0	0	+	0	+	0	+	0	0	0		2+
11	R1R1	316363	/	/	0	0	/	0	0	0	0	/	0	/	/	/	0	/	0	/	/	0	/	/	0	/	0	/	+	+	HLA+	0
	Patient Cells																															
	Mode of Reactivity		37°C/Antiglobulin								Antiglobulin											Variable		Cold				Var.			

Shaded columns indicate those antigens which are destroyed or depressed by enzyme treatment. "/" represents "Not Tested" for new donors.

Additional Cells	Rh-hr	KELL	DUFFY	KIDD	Sex Linked	LEWIS	MNS	P	LUTHERAN	Special Antigen Typing	Test Results

Additional cells



Master List

TECH_____ DATE_____

MUCOR, INC. Norcross, GA 30071 USA
S. License No: 886 Lot No: 44399 Exp. Date: 2016/01/08

SYSTEM	Rh - Hr							Kell						Duffy		Kidd		Lewis		P	MN				Lutheran		Xg	Special Antigen Type	PATIENT'S TEST RESULTS	
Donor	D	C	c	E	e	V	C^w	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}		
R1wR1 B8507	+	+	0	0	+	0	+	+	+	0	+	0	+	+	+	+	0	0	+	+	0	+	+	+	+	+	+	Co(b+)	1
R1R1 B5185	+	+	0	0	+	0	0	0	+	0	+	0	+	0	+	+	0	0	0	+	0	+	0	+	0	+	0		2
R1R1 B9117	+	+	0	0	+	0	0	0	+	0	+	0	+	+	0	+	+	0	+	+	+	0	+	0	0	+	0		3
R1R1 B9122	+	+	0	0	+	0	0	0	+	0	+	0	+	+	0	0	+	+	0	+	+	0	+	+	0	+	+	Co(b+)	4
R1R1 B4229	+	+	0	0	+	0	0	+	+	0	+	0	+	0	+	+	+	0	+	+	+	+	0	+	0	+	0	Yt(b+), Co(b+)	5
R2R2 C588	+	0	+	+	0	0	0	0	+	0	+	0	+	+	+	+	+	+	0	+	0	+	+	+	+	+	+		6
R2R2 C5774	+	0	+	+	0	0	0	0	+	0	+	0	+	+	0	0	+	0	+	0	+	+	0	+	0	+	+		7
R2R2 C5932	+	0	+	+	0	0	0	0	+	0	+	0	+	0	+	+	0	0	+	0	+	0	0	+	0	+	+		8
R2R2 C5184	+	0	+	+	0	0	0	0	+	0	+	0	+	+	+	+	+	+	0	0	+	+	0	+	0	+	0		9
R1r R2015	+	W	+	0	+	+	0	0	+	0	+	0	+	0	0	+	+	0	0	+	0	+	+	+	0	+	+		10
	D	C	c	E	e	V	C^w	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}		
r'r E458	0	+	+	0	+	0	0	+	+	0	+	0	+	+	0	+	0	0	+	0	0	+	0	+	0	+	+		11
r"r F865	0	0	+	+	+	0	0	0	+	0	+	0	+	0	+	+	+	+	0	+	0	+	+	+	+	+	+	Bg(a+)	12
rr N4051	0	0	+	0	+	0	0	0	+	0	+	0	+	0	+	0	+	+	0	0	+	0	+	+	0	+	+		13
rr N1713	0	0	+	0	+	0	0	0	+	0	+	0	+	0	+	+	+	0	0	+	+	0	+	0	0	+	+		14
rr N4145	0	0	+	0	+	0	0	0	+	0	+	0	+	0	+	+	0	0	+	+	+	0	+	+	0	+	+		15
rr H1136	0	0	+	0	+	0	0	0	+	0	+	0	+	+	0	+	0	0	+	+	+	0	0	+	0	+	+		16
rr G242	0	0	+	0	+	0	0	+	0	0	+	0	+	+	+	0	+	0	+	+	+	+	+	+	0	0	+	+		17
rr N3031	0	0	+	0	+	0	0	0	+	0	+	0	+	0	+	+	0	0	+	+	+	+	+	+	0	0	+	+	Co(b+)	18
rr H1180	0	0	+	0	+	0	0	0	+	0	+	0	+	+	0	+	0	+	0	0	0	+	0	+	0	+	+		19
Ror D1366	+	0	+	0	+	+	0	0	+	0	+	0	+	0	0	+	0	0	0	+	+	+	0	+	0	+	+		20
PATIENT'S CELLS																											PATIENT'S CELLS		

ıose instances where a patient's serum is known to contain anti-D, it may be desirable to perform antibody screening tests with D- red cells. panel cells 11,12 and 13 can be used together to form a D- negative antibody screening reagent.

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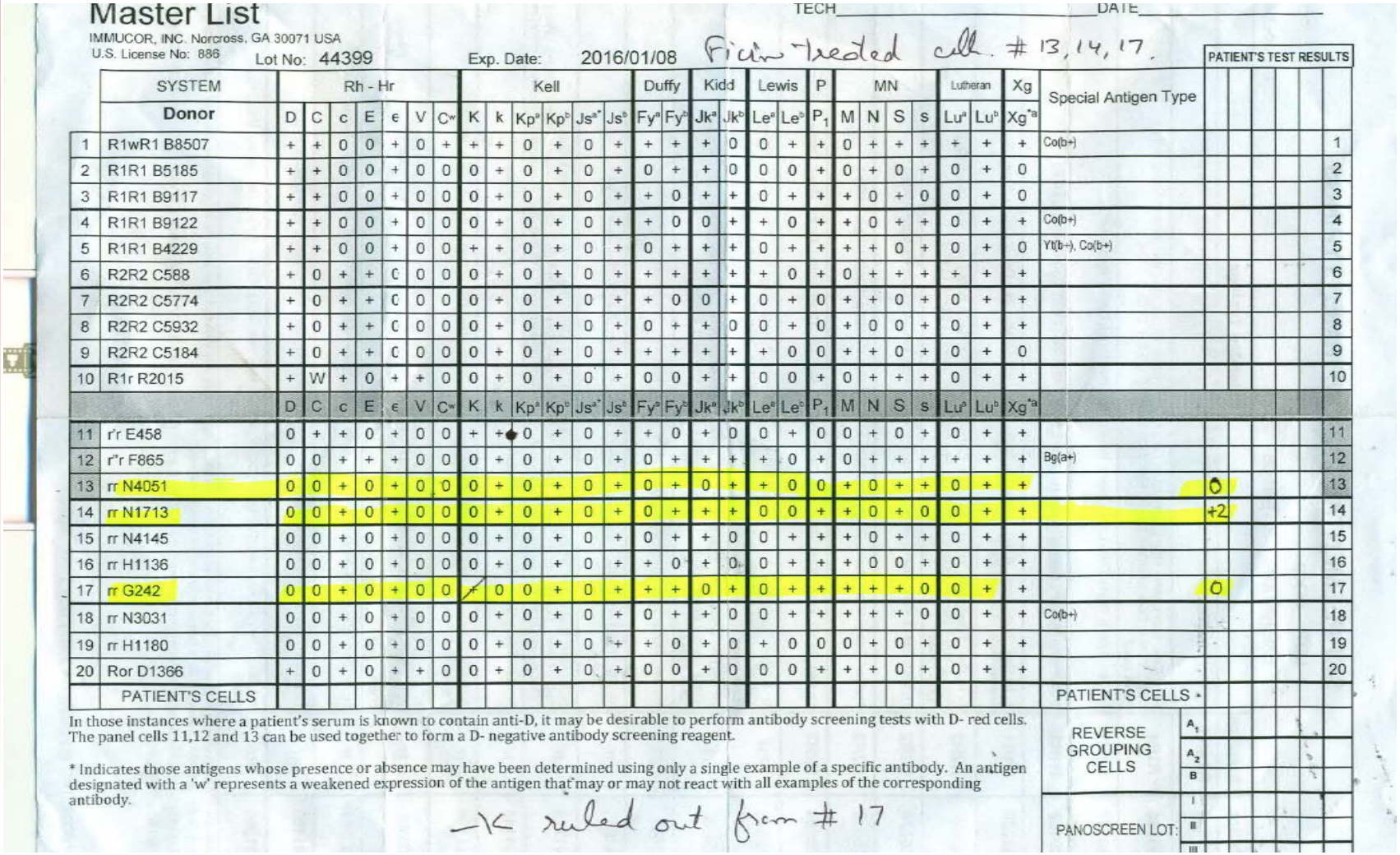
REVERSE GROUPING CELLS	A_1								
	A_2								
	B								
	I								

Additional cells



Master List

IMMUCOR, INC. Norcross, GA 30071 USA
U.S. License No: 886 Lot No: 44399 Exp. Date: 2016/01/08 Ficin treated cells # 13, 14, 17.

TECH _____ DATE _____

	SYSTEM	Rh - Hr							Kell						Duffy		Kidd		Lewis		P	MN				Lutheran		Xg	Special Antigen Type	PATIENT'S TEST RESULTS	
	Donor	D	C	c	E	e	V	Cʷ	K	k	Kpᵃ	Kpᵇ	Jsᵃ*	Jsᵇ	Fyᵃ	Fyᵇ	Jkᵃ	Jkᵇ	Leᵃ	Leᵇ	P_1	M	N	S	s	Luᵃ	Luᵇ	Xg*ᵃ			
1	R1wR1 B8507	+	+	0	0	+	0	+	+	+	0	+	0	+	+	+	+	0	0	+	+	0	+	+	+	+	+	+	Co(b+)		1
2	R1R1 B5185	+	+	0	0	+	0	0	0	+	0	+	0	+	0	+	+	0	0	0	+	0	+	0	+	0	+	0			2
3	R1R1 B9117	+	+	0	0	+	0	0	0	+	0	+	0	+	+	0	+	+	0	+	+	+	0	+	0	0	+	0			3
4	R1R1 B9122	+	+	0	0	+	0	0	0	+	0	+	0	+	+	0	0	+	+	0	+	+	0	+	+	0	+	+	Co(b+)		4
5	R1R1 B4229	+	+	0	0	+	0	0	+	+	0	+	0	+	0	+	+	+	0	+	+	+	+	0	+	0	+	0	Yt(b−), Co(b+)		5
6	R2R2 C588	+	0	+	+	C	0	0	0	+	0	+	0	+	+	+	+	+	+	0	+	0	+	+	+	+	+	+			6
7	R2R2 C5774	+	0	+	+	C	0	0	0	+	0	+	0	+	+	0	0	+	0	+	0	+	+	0	+	0	+	+			7
8	R2R2 C5932	+	0	+	+	C	0	0	0	+	0	+	0	+	0	+	+	0	0	+	0	+	0	0	+	0	+	+			8
9	R2R2 C5184	+	0	+	+	C	0	0	0	+	0	+	0	+	+	+	+	+	+	0	0	+	+	0	+	0	+	0			9
10	R1r R2015	+	W	+	0	+	+	0	0	+	0	+	0	+	0	0	+	+	0	0	+	0	+	+	+	0	+	+			10
		D	C	c	E	e	V	Cʷ	K	k	Kpᵃ	Kpᵇ	Jsᵃ*	Jsᵇ	Fyᵃ	Fyᵇ	Jkᵃ	Jkᵇ	Leᵃ	Leᵇ	P_1	M	N	S	s	Luᵃ	Luᵇ	Xg*ᵃ			
11	r'r E458	0	+	+	0	+	0	0	+	+	0	+	0	+	+	0	+	0	0	+	0	0	+	0	+	0	+	+			11
12	r"r F865	0	0	+	+	+	0	0	0	+	0	+	0	+	0	+	+	+	+	0	+	0	+	+	+	+	+	+	Bg(a+)		12
13	rr N4051	0	0	+	0	+	0	0	0	+	0	+	0	+	0	+	0	+	+	0	0	0	+	0	+	+	0	+	+	0		13
14	rr N1713	0	0	+	0	+	0	0	0	+	0	+	0	+	0	+	+	+	0	0	+	+	0	+	0	0	+	+		+2		14
15	rr N4145	0	0	+	0	+	0	0	0	+	0	+	0	+	0	+	+	0	0	+	+	+	0	+	+	0	+	+			15
16	rr H1136	0	0	+	0	+	0	0	0	+	0	+	0	+	+	0	+	0	0	+	+	+	0	0	+	0	+	+			16
17	rr G242	0	0	+	0	+	0	0	/	0	0	+	0	+	+	+	0	+	0	+	+	+	+	+	0	0	+	+		0		17
18	rr N3031	0	0	+	0	+	0	0	0	+	0	+	0	+	0	+	+	0	0	+	+	+	+	+	0	0	+	+	Co(b+)		18
19	rr H1180	0	0	+	0	+	0	0	0	+	0	+	0	+	+	0	+	0	+	0	0	0	+	0	+	0	+	+			19
20	Ror D1366	+	0	+	0	+	+	0	0	+	0	+	0	+	0	0	+	0	0	0	+	+	+	0	+	0	+	+			20
	PATIENT'S CELLS																											PATIENT'S CELLS		

In those instances where a patient's serum is known to contain anti-D, it may be desirable to perform antibody screening tests with D- red cells. The panel cells 11,12 and 13 can be used together to form a D- negative antibody screening reagent.

* Indicates those antigens whose presence or absence may have been determined using only a single example of a specific antibody. An antigen designated with a 'w' represents a weakened expression of the antigen that may or may not react with all examples of the corresponding antibody.

−K ruled out from # 17

REVERSE GROUPING CELLS: A_1, A_2, B

PANOSCREEN LOT: I, II, III

Antigen Phenotyping

	C	E	c	e	K	k	Fy^a	Fy^b	Le^a	Le^b	Jk^a	Jk^b	S	s	M	N
Pt	+	0	0	+	0	+	0	+	0	+	0	+	+	+	+	+
Husband	+	0	0	+	0	+	+	+	0	+	+	+	0	+	0	+

Antibody detected

Antibodies: anti Fy^a & anti Jk^a

Anti K is rule out from cell #17 after Ficin treatment

Anti N & Anti S ruled out since patient found positive for both the antigens

To find antigen negative blood for the patient donors phenotyping was started

Donor units tested

Unit ID	Fy^a	Jk^a
Rttk C79088	+	+
Rttk C79082	+	0
Rttk C79098	0	+
Rttk C78291	+	0
Rttk C79066	0	+
Rttk C79054	+	+
Rttk C78996	+	0
Rttk C79278	0	+
Rttk C79564	+	0

Donor units tested

Unit ID	Fy^a	Jk^a
Rttk C79676	+	+
Rttk C79872	+	0
Rttk C79563	0	+
Rttk C79344	+	0
Rttk C79123	0	+
Rttk C79544	+	+
Rttk C79323	0	0
Rttk C78789	0	+
Rttk C78234	+	0

Interim Antibody Identification
Possible Answers and Next Steps

Patient developed two antibodies after exposure from first pregnancy

Antibodies found Fy^a & Jk^a

Unit no Rttk C79323 which was negative for both the antigens selected for transfusion

Updated Clinical Information

Patient underwent LSCS (Lower segment Caesarean section) & it was uneventful

Patient received one unit of transfusion & no reaction reported

Hb: 8.1 gm% post delivery

No Jaundice reported in neonate & DAT found negative

Conclusions

Presence of multiple red cell allo antibodies is uncommon phenomenon in Indian population

Ante natal antibody screen in not practiced in India routinely

Implementing Antibody screening as ante natal testing will save time of searching compatible blood at the time of bleeding

Conclusions

India doesn’t have rare donor registry, therefore blood transfusion for those patients is a challenging task of blood banks

Summary of Case Challenges

Pregnant Female admitted for labor with bleeding

Red cell transfusion was requested

Most of the available units found incompatible

Antibody screen & identification showed presence of Fy^a & Jk^a antibodies

Unit found which is negative to both antigens after typing many red cells

Safe blood transfusion led to safe child birth

Lessons Learned by the Case

Emergency blood transfusion in allo immunized patients is a challenge

It is suggested to screen all the pregnant females for red cell antibodies so that the appropriate units can be arranged in advance

There is a need to develop a Rare blood donor panel so that the allo immunized patients with multiple antibodies & common antibodies can receive safe blood transfusion

References

Varghese J, Chako MP, Rajaiah M, Danieal D. Red cell alloimmunization among antenatal women attending a tertiary care hospital in south India. Indian J Med Res. 2013 Jul; 138(1): 68–71.

Pahuja S, Gupta SK, Pujani M, Jain M. The prevalence of irregular erythrocyte antibodies among antenatal women in Delhi. Blood Transfus. 2011 Oct; 9(4): 388–393.

ZaccheausA, Augustina M, Buseri F, Adias TC. Frequencies of maternal red blood cell alloantibodies in Port Harcourt, Nigeria. Asian J Transfus Sci. 2011 Jan; 5(1): 39–41.