CASE REPORT: LIFE -SAVING INCOMPATIBLE TRANSFUSION

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Background

Since clinical significant antibodies can cause hemolytic transfusion reactions, it is essential to consider them when transfusion is required. Our report is based on an 81-year old Caucasian male patient with anti-e, -Ce and -Fy^a who required mitral valve surgery.
In consultation with the surgeon, 4 fully compatible red blood cell units were provided for the intervention.

Due to intraoperative complications, the patient required heart-lung machine support. As another 12 units were requested the challenge was to select the least incompatible units.

Methods

Standard serological methods were used for antibody specification and direct antiglobulin test (DAT) (Grifols, CH, BioRad, CH and in-house).
Compatibility testing was performed using indirect antiglobulin test (IAT) at 37°C (gel-card, BioRad, CH) and molecular typing of the patient's so called rare blood group antigens by PCR-SSP (inno-train, D).

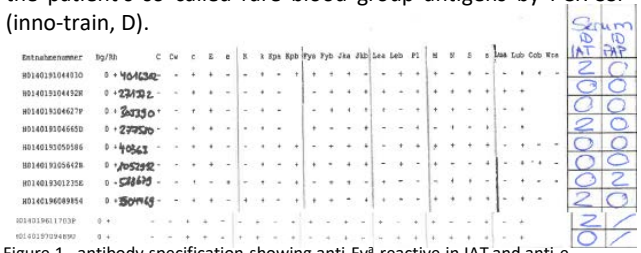


Figure 1. antibody specification showing anti-Fy^a reactive in IAT and anti-e only reactive with papain-treated test cells

Results

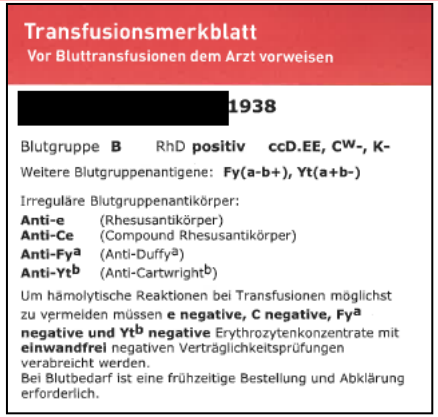
The patient's phenotype was B, ccD.EE (R_2R_2), K- and Fy(a-b+).
Pretransfusion testing revealed anti-Ce and anti-Fy^a reactive in IAT and anti-e only reactive with papain-treated test cells.
In absence of compatible products we decided not to consider the anti-e and selected O ccDEe (R_2r), K-, Fy^a- RBC units for compatibility testing.

All of the incompatible units (n=12) showed negative cross matches . Finally, 7 of these incompatible products were transfused during the night.

A few days after incompatible transfusion the patient's serum showed a positive XM with a supposedly compatible red blood cell unit (R_2R_2, K-, Fy^a-).

Subsequent analyses revealed an anti-Yt^b (Cartwright^b) and patients genotyping confirmed Yt^b negativity. Consistently, the cross match positive red blood cell product as well as at least one of the cross match negative units transfused in emergency were determined Yt^b positive.

The patient's DAT, autocontrol and eluate remained negative during the entire follow up and no clinical or laboratory signs of major intra- or extravascular hemolysis was observed.



Transfusionsmerkblatt
Vor Bluttransfusionen dem Arzt vorweisen

[redacted]1938

Blutgruppe **B** RhD **positiv** **ccD.EE, C^w-, K-**

Weitere Blutgruppenantigene: **Fy(a-b+), Yt(a+b-)**

Irreguläre Blutgruppenantikörper:

Anti-e (Rhesusantikörper)
Anti-Ce (Compound Rhesusantikörper)
Anti-Fy^a (Anti-Duffy^a)
Anti-Yt^b (Anti-Cartwright^b)

Um hämolytische Reaktionen bei Transfusionen möglichst zu vermeiden müssen **e negative, C negative, Fy^a negative und Yt^b negative** Erythrozytenkonzentrate mit **einwandfrei** negativen Verträglichkeitsprüfungen verabreicht werden.
Bei Blutbedarf ist eine frühzeitige Bestellung und Abklärung erforderlich.

Figure 2.
transfusion document including recommendations for the selection of compatible blood to avoid trasnsfusion reactions

Conclusion

The fact that the anti-e was only enzyme-reactive was crucial for our decision to neglect this ab; thereby considering the other two antibodies (anti-Ce and anti-Fy^a) as well as being able to issue units with negative cross matches.
After the incompatible transfusion, follow-up showed no signs of hemolysis. However, a newly formed or boostered low-prevalence antibody, anti-Yt^b, was identified shortly thereafter, when a fresh patient sample showed positive cross match with a previously cross match negative red blood cell product.