

ABID CASE #11, ANSWERS

Case study by Jim Perkins, M.D. (© 2006)



1. What is the identity of this antibody?

Anti-Lu^a

2. Is any further workup needed to prove it? Comment on the sensitivity of the gel and PEG techniques in this case.

There are 3 (actually 4) Lu^a positive cells reactive, and 3 non-reactive Lu^a negative cells, and the appropriate antibodies are ruled out. Routinely we attempt to test the patient for the antigen corresponding to the hypothesized antibody. However, anti-Lu^a typing sera are not commercially available.

The gel reactions in this case were slightly more robust than those with the PEG/tube method.

3. Is the patient at risk for an immediate hemolytic transfusion reaction? A delayed hemolytic transfusion reaction?
Would this antibody cause hemolytic disease of the fetus and newborn?

Anti-Lu^a does not cause hemolytic transfusion reactions. It may cause a positive DAT in newborns, and such newborns may require phototherapy.

4. Four weeks earlier the patient's antibody screen was negative. Why wasn't the antibody detected at that time? Do you think the patient had not yet made it?

At a prevalence of 8% in Caucasians and 5% in African-Americans Lu^a is not usually expressed on antibody detection cells, so anti-Lu^a is typically missed in the antibody screening test when present alone. They are often detected when one panel cell is reactive in a workup for some other antibody, or when a crossmatch is unexpectedly positive.

5. What is the biochemical nature of the antigen? To what family of structures does it belong?

Lutheran antigens are carried by a glycoprotein of the immunoglobulin superfamily which is thought to be an adhesion factor for the extracellular matrix glycoprotein laminin. Lu^b is a high frequency antigen (>99% in all populations) and two "null" types exist, rare true recessive Lu_{null} states due to inactivating mutations in the Lutheran gene and a less rare dominant type termed "In(Lu)" due to a suppressor gene. In the latter case although the cells may not be agglutinated by anti-Lu^b, adsorption/ elution studies demonstrate low levels of antigen expression, and presence of an In(Lu) gene affects expression of multiple blood groups. In any case Lutheran antigen expression varies among RBCs of one individual and can result in a mixed field appearance with anti-Lu^b sera. Lutheran antigens are not destroyed by ficin and papain, but are destroyed by the less commonly used trypsin and α -chymotrypsin. The sulfhydryl bond reducing agents DTT and AET eliminate reactivity of RBCs with most anti-Lu^a and -Lu^b.