

Preface

Pre-transfusion testing, including ABO/Rh typing, identification of unexpected antibodies, and compatibility testing, is an important measure in the provision of blood that may be transfused to the patient in the safest possible manner. This brief introduction is not intended to give the trainee a detailed instruction on solving immunohematology cases; rather, it is intended to give an overview on how to approach the immunohematology problems (Chaps. 1–28) of this workbook. The authors of this workbook presume that the reader has had at least basic instruction in immunohematology before engaging in these cases.

Although one may be tempted to jump right to the antibody panel after noting a positive antibody screen in the presented cases, it is recommended to review the clinical history for important clues that may be helpful in solving the case. For example, a history of prior transfusions suggests that the patient could have made clinically significant alloantibodies (i.e., warm-reactive IgG alloantibodies capable of causing hemolytic transfusion reactions or hemolytic disease of the fetus or newborn). Alternatively, the use of phrases such as “routine clinic visit” may suggest that the patient is clinically stable despite significant anemia. In these practice cases, as in the real medical world, obtaining clinical history is an important step not to be overlooked, though in some of these cases (as sometimes occurring in actual practice), scant history is provided.

After reviewing the medical history, the next step is to interpret the ABO/Rh typing results. In most cases, this will be straightforward, though one should be alert to any discrepancy in the forward and reverse typing results. For example, noting a positive result with the A₁ cell in the back type may be the result of anti-A₁ antibody in an individual of A₂ blood type or the result of a cold allo- or autoantibody.

Next, one should review the antibody screen. It should be noted that in this workbook, we present a two-cell screen in either standard tube or gel (column agglutination) methods. Although typically, the antibody screen is interpreted simply as positive or negative, limited additional information can be gleaned by noting differences in reactions between the two cells (i.e., whether both cells or only one cell reacting) or differences in the testing phases (i.e., if tube method is used, differences in reactions between 37°C vs. AHG phase). Additionally, the antigen profiles of

the antibody screen cells are listed in the beginning which may also provide useful information when ruling out antibodies.

After review of the clinical history, ABO/Rh typing, and antibody screen, one is ready to move on to the antibody panels if performed in the case (see Fig. 1). Although traditionally one is taught to interpret the antibody panels through a process of crossing out antigens, it is prudent to first take a moment to get a “landscape” view of the panel reactions. That is, one should look to see whether there are reactions at cold temperatures (i.e., 4°C, RT, IS) or warm temperatures (37°C, IgG), whether there are many cells that are positive (perhaps all cells are positive as in a panagglutinin reaction) or only few and whether the autocontrol is positive or negative. Such consideration may help to narrow the possible specificities of the present antibodies. In that light, for example, if reactions are only evident at 4°C in the panel, then warm-reactive antibodies (such as anti-D, -K, -Jk^a, etc.) can promptly be excluded. Finally, after this initial review, one should then move on to the methodical exclusion of antibody specificities. This is traditionally taught as “crossing out” antigens in which the reactions are negative with attention toward dosage (i.e., homozygous vs. heterozygous antigen expression). Figure 2 demonstrates crossing out with respect to negative reactions, dosage, and the patient’s RBC antigen phenotype. The effect of enzyme treatment (e.g., papain or ficin) may also be of value as antibody reactivity to some antigens may be enhanced or destroyed. Ultimately, after consideration of all of the clinical information and antibody identification testing, the identity of the antibody or antibodies may be determined so that the most compatible blood can be provided for the patient in case transfusion is necessary.

In the end, these cases are not necessarily meant to be difficult (though they do become more challenging as one progresses through the workbook) but are selected based on principle to introduce the practical concepts of and methods used in immunohematology antibody identification. Once the learner has grasped these basic techniques, he/she can apply them to more interesting cases that may be presented to them within the actual clinical practice of the transfusion service.

Finally, Chaps. 29–35 are designed to engage the learner in other aspects of transfusion medicine including use of massive transfusion, therapeutic apheresis, factor concentrates, and blood management.

Immunohematology and Transfusion Medicine

A Case Study Approach

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2016, XV, 180 p. 2 illus. in color., Hardcover

ISBN: 978-3-319-22341-4