

## Case Report

### Significance of Type and Screen in Elective Surgery: A Case Report

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#### Abstract

Blood group typing and antibody screening (T&S) is done on patients who may need transfusion of blood products, yet it was missed in a planned surgery case. A 60 years old female with left renal mass was posted for nephrectomy. Samples for T&S were sent to the blood bank the night before the surgery. The patient's blood group was "AB" negative and also had "C" antibody which led to incompatible cross-matches with donor units. An extensive search yielded in two cross-match compatible "AB" negative RBC units which were also negative for "C" antigen. It could be a surgeon's nightmare intraoperatively in the absence of appropriate blood units or the surgery could be delayed if not canceled. It is imperative for all institutions to make their own time frame for T&S in patients posted for surgery.

**Keywords:** Blood group, typing and antibody screening, pre-operative workup.

#### Introduction

Blood typing test identifies antigens on red cell membrane (RBC) belonging to the ABO blood group system and are then classified into A, B, AB, and O blood groups. Antibody screening is done to detect unexpected antibodies in the serum that may develop after transfusion or pregnancy. Type and screen (T&S) is done on patients who may need transfusion of blood products. These tests are done prior to the compatibility test. A cross-match ensures that no antibodies are detected in the recipient's serum that will react with the donor's red blood cells. A standard T&S usually takes around 30 minutes. If the screen is negative, ABO-compatible blood from the inventory can be cross-matched within minutes. On the contrary, if the antibody screen is positive, further work-up is required to identify the antibody and search for the antigen-negative unit and the entire process is time-consuming. [1]

#### Case report

We would highlight a planned surgery case where a 60 year old female with left renal mass was posted for nephrectomy a week later, according to the availability of the operation theater. On computed tomography it was an ill defined hypodense lesion in the lower pole of left kidney measuring 7.9 x 8.9 cms. Viral serology was non-reactive, hemoglobin levels was 12.1gm/dl and with normal renal functions. The patient was hypertensive and MRI brain revealed a meningioma measuring 3.8 x 2.8 x 3.2 cms with a recent infarct in left corona radiata. The patient had been reviewed by the anaesthesia team with relevant investigations a week before the surgery. Surprisingly her T&S was initially missed, until the surgery registrar sent the request for two units of RBC on the night before the surgery anticipating blood loss in the operation theater.

The patient's blood group was "AB" negative and the cross-match with four donor units was incompatible. The antibody screen (3 cell panel) was positive (Fig 2). Besides routine work, the single technologist posted on night duty did the 11 cell panel test (Ortho-clinicals,USA) to identify the "C" antibody in the

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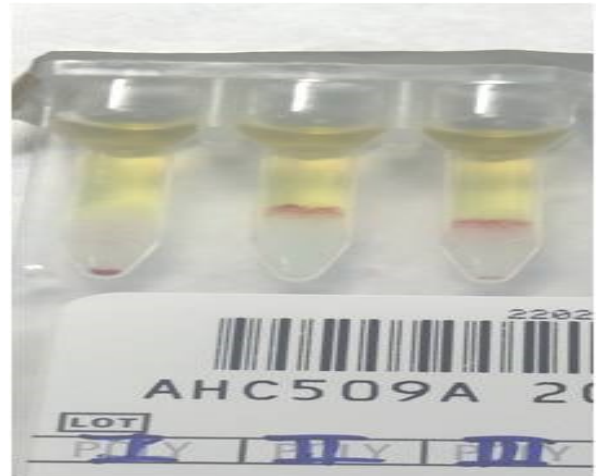
patient's sample. Since the case was posted first for surgery next morning, an extensive search yielded in two cross-match compatible "AB" negative RBC units which were also negative for "C" antigen (Fig 1). Though, the patient did not require transfusion intraoperatively, it could have been a surgeon's nightmare in the absence of appropriate blood units or the surgery could have got delayed if not canceled.



**Fig 1.** The 1<sup>st</sup> column shows compatible cross-match with antigen negative donor unit and 2<sup>nd</sup> column shows incompatible cross-match with antigen positive unit

## Discussion

"AB" blood group is the least commonest among the ABO blood groups in Indian population as well as globally. Infact, Patel and others showed that "AB" negative comprised only 0.45% of 5316 donors in his study done in Western India.<sup>[2]</sup> Even in our blood bank, the stock of "AB" negative RBC is less compared to other groups. In addition, to find a "C" antigen-negative unit is even more difficult. Makroo and others found the prevalence of "C" antigen to be 87 % among 3073 donors in north India.<sup>[3]</sup> So practically, if a north Indian patient with alloantibody against "C" antigen requires two units of RBC, a minimum of 30-40 units of ABO matched blood would have to be tested for "C" antigen to find antigen negative RBC.<sup>[4]</sup> The "C" antigen frequency among "D" antigen negative donors is only 10%.<sup>[5]</sup> Hence, the antigen negative units could be identified by the technologist at our blood bank.



**Fig 2.** 3-cell panel antibody screen shows agglutination in 2<sup>nd</sup> and 3<sup>rd</sup> column

Many hospitals have same day admission of patients for surgery and subsequently their samples are sent to the blood bank for T&S in entire sugars is convenient for many patients.<sup>[6,7]</sup> A study at the College of American Pathologists Q-probe found that a significant subset of patients (2% of total) were at risk as the T&S collected on the same day as surgery revealed an unexpected allo-antibody.<sup>[7]</sup> This Q-probe revealed that many surgeons were ignorant about the time consuming effort by the blood bank staff to find cross-match compatible blood for patients with a positive T&S. Even in our institution we repeatedly highlighted the problem at several transfusion committee meetings to sensitize the clinicians regarding the significance of T&S prior to surgeries.

Discussions with surgeons and anaesthetists lead to mandatory inclusion of T&S in the initial pre-operative work-up and a subsequent check-list, which the surgical fellow completes a day before the surgery. The new T&S protocol helped in early identification and resolution of cases with antibodies and rare blood groups. A study showed that 12 patients who were either already in or en route to the operation theater where the surgery had to be canceled due to lack of available blood. Such situations are completely avoidable if the pre-admission T&S is done. Avoidable delays in transfusion services amounts to process errors<sup>[8]</sup> and could be serious threat to patient's life in time-sensitive situations.

## Conclusion

T&S testing should be ideally completed before the surgery begins. In absence of any clear guidelines on T&S for elective surgeries, it is imperative for all institutions to make their own time frame for T&S in patients posted for surgery.

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