Transfusion and Apheresis Science 49 (2013) 661–664

Contents lists available at SciVerse ScienceDirect

Transfusion and Apheresis Science

journal homepage: www.elsevier.com/locate/transci

Case Report

Combined plasma exchange and platelet transfusion in immune-mediated thrombocytopenic emergencies

Laura Finn *, Han Tun

Mayo Clinic, Jacksonville, FL, United States

ARTICLE INFO

Article history:
Received 23 May 2013
Accepted 21 June 2013

Keywords:
Immune mediated thrombocytopenia
Plasma exchange

ABSTRACT

Refractory immune-mediated thrombocytopenia (ITP) can be very difficult to manage, especially if associated with a hemorrhagic or surgical emergency. We report two cases of refractory ITP that were unresponsive to routine therapeutic interventions and frequent platelet transfusions. A combination of plasma exchange and platelet transfusion successfully raised the platelet count to a level that permitted life-saving surgical interventions. Plasma exchange in these two cases likely reduced platelet antibodies significantly, decreasing platelet destruction. We propose that a trial of combination plasma exchange and platelet transfusion can be attempted in emergent thrombocytopenic situations with an underlying immune mechanism.

1. Introduction

Refractory ITP may be defined as the failure of any intervention to maintain the platelet count above 20,000/mm^3 [1]. Management includes almost continuous platelet transfusions that often prove unsuccessful in many patients. Pharmacologic therapies have been used to treat chronic refractory ITP by attempting to increase platelet counts by decreasing platelet destruction including steroids, intravenous immunoglobulin (IVIG), azathioprine, danazol, dapsone, cyclosporine, rituximab, and combination chemotherapy [1]. Responses to such medications can be variable to poor and these treatments are associated with immune suppression. Recently, newer therapies have been approved including romiplostim and eltrombopag [2]. The time needed for these therapies to achieve an adequate platelet response ranges from one to two weeks, which would be too long for a patient with a life-threatening hematologic emergency. We effectively treated two patients with refractory ITP with plasma exchange and platelet transfusions, allowing both patients to proceed with critical surgical intervention.

2. Case 1

A 49-year-old man developed severe thrombocytopenia nine months after a related donor non-myeloablative allogeneic hematopoietic stem cell transplant for recurrent/refractory follicular lymphoma. Complete blood counts showed isolated severe thrombocytopenia with a platelet count as low as 2000/mm^3. The bone marrow biopsy showed increased megakaryocytes. Imaging scans did not show splenomegaly or lymphadenopathy. There were no clinical findings suggestive of graft versus host disease. Platelet antibody testing was positive. Based on all these findings, his thrombocytopenia was determined to be immune-mediated. He did not achieve any significant or sustained response to steroids, immunoglobulin (IVIG), rituximab, and Rho Immunoglobulin D (WinRho). The decision was made to proceed with splenectomy. Pre-operatively, his platelet count was 2–5000/mm^3 and he was given 1 unit of single donor platelets every 4–6 h; however, the platelet count did not increase significantly. Therapeutic plasma exchange with albumin every 12 h was added to

* Corresponding author. Address: 4500 San Pablo Road, Jacksonville, FL 32224, United States. Tel.: +1 904 953 7290; fax: +1 904 953 2315.
E-mail address: finn.laura@mayo.edu (L. Finn).

1473-0502/$ - see front matter © 2013 Elsevier Ltd. All rights reserved.
http://dx.doi.org/10.1016/j.transci.2013.06.019

the patient's scheduled platelet transfusions and resulted in a dramatic increase in the platelet counts to a normal range within 24 h (Fig. 1). Moreover, the platelet count was sustained in the normal range without further transfusion. This allowed the patient to undergo splenectomy safely and successfully. His platelet count has remained in the normal range since his splenectomy.

3. Case 2

A 60 year old man developed acute severe thrombocytopenia after orthotopic liver transplant for Hepatitis B virus related end stage liver disease. His platelet count prior to transplant was 55–60,000/mm^3 attributed to hypersplenism. Immediately after transplant, his platelet count decreased to 4000/mm^3. Bone marrow biopsy showed adequate megakaryopoiesis consistent with platelet consumption/sequestration. An immune mechanism was thought to be the underlying cause as no other etiologies were found by extensive testing, and the patient had a history of an autoimmune disorder, systemic lupus erythematosis. He did not respond to steroids, IVIG, or rituximab. His platelet count did not go up significantly, even with single donor platelet transfusions every 6 h. He developed massive intra-abdominal bleeding on post-operative day 8, became hemodynamically unstable, and was in a life-threatening situation. Immediate surgical intervention could not be contemplated, as the patient was still severely thrombocytopenic. Plasma exchange was added to continuous platelet transfusions with a dramatic improvement in the platelet count to 120,000/mm^3 (Fig. 2). He was taken to surgery soon afterwards and had evacuation of his intra-bdominal hematoma with control of the bleeding sources. He initially received plasma exchange every 12 h for 3 days, which was weaned to every 24 h for 4 days. Continuous platelet transfusions were stopped 1 day after plasma exchange started and were changed to scheduled platelet transfusions twice daily for 1 additional day. The patient then received platelet transfusions as needed to maintain a platelet count of 75,000/mm^3 for one week to prevent post-operative bleeding before stabilizing to his baseline thrombocytopenia. He recovered completely and his liver transplant was a success.

4. Discussion

An immune etiology is the most common cause of thrombocytopenia. It can be a primary process as in immune thrombocytopenia (ITP) or secondary to other conditions. It is usually characterized by adequate or increased megakaryocytes in bone marrow and the absence of non-immune etiologies such as sepsis and drugs. Immune-mediated thrombocytopenia can be quite challenging to manage if it is refractory to standard treatments and platelet transfusions. The platelet count can spiral down and hemorrhagic emergencies can arise. In clinical situations where surgical intervention is necessary, refractory immune-mediated thrombocytopenia can be very challenging. We reported two very difficult cases of thrombocytopenic emergencies and showed that com-

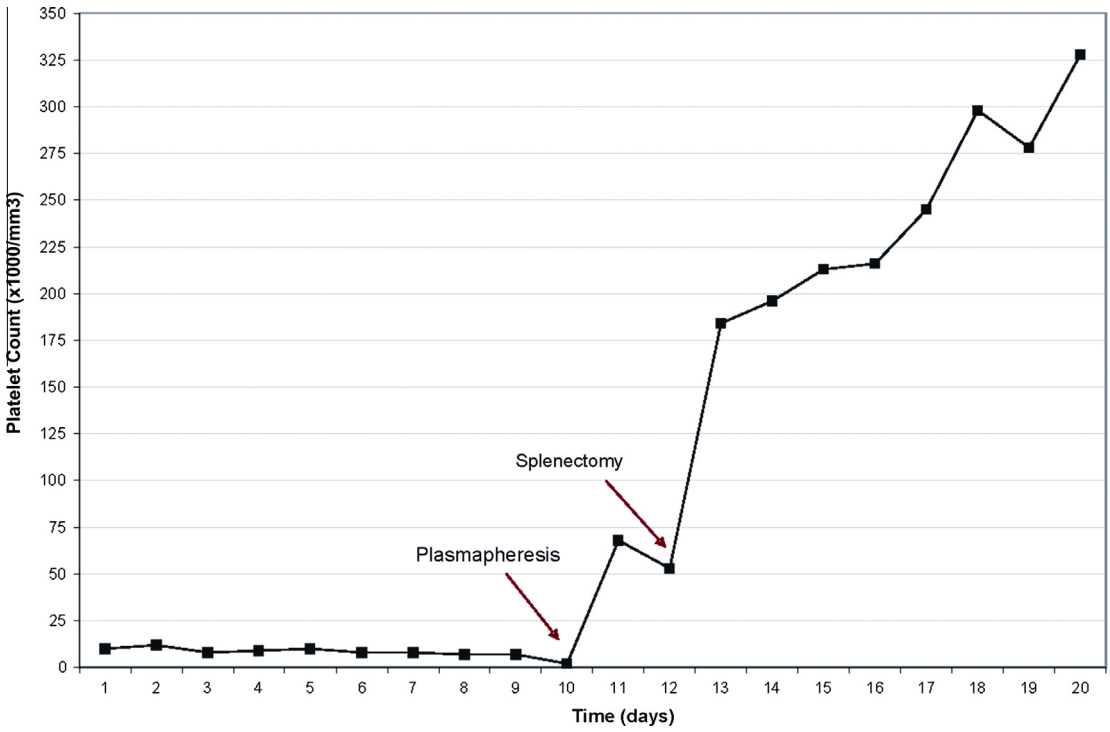

Fig. 1. *Case* 1. *Platelet recovery after Plasmapharesis and splenectomy*. Platelet counts in Case 1 demonstrate a dramatic increase to the normal range 24 h after initiation of combined plasma exchange and platelet transfusion.