Reduced Transfusion Requirements in a Splenectomized Patient Undergoing Bone Marrow Transplantation

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The spleen is an essential organ in normal platelet kinetics. Especially in splenomegalic subjects, a large proportion of transfused platelets are sequestered and/or destroyed in this organ [1]. Thus, it is not surprising that the transfusion requirements of splenectomized patients undergoing bone marrow transplantation (BMT) are lower than those of splenomegalic patients although few reports specifically address this issue [2]. We describe such a case and compare the transfusion needs with a group of comparable nonsplenomegalic subjects.

Acute lymphoblastic leukemia was diagnosed in a 43-year-old woman after a spontaneous splenic rupture [3]. Complete remission was obtained with induction chemotherapy, followed by two courses of consolidation therapy. In October 1993, an allogeneic BMT from an HLA-identical and ABO-compatible brother was performed. The clinical course during BMT was uncomplicated except for a 4-day episode of granulocytopenic fever which resolved with empirical antibiotics. Pancytopenia was less severe than expected, as seen in figure 1, and she prophylactically received only 13 units of random-donor platelets (pooled in two transfusions); no RBC transfusions were needed. Hematopoietic recovery was mediated by 100% donor-derived cells. Grade 2 acute graft-versus-host disease (AGVHD) developed, easily controlled with prednisone. The patient is currently well, 10 months after BMT.

From late 1990 to late 1993, 59 adults underwent an allogeneic BMT from an HLA-identical sibling at our institution. Those with aplastic anemia, relapsed acute leukemia at BMT, chronic myelogenous leukemia (CML)

Days after BMT

Fig. 1. Levels of WBC (■), PLT (A) and Hb (▼) from day 0 and until complete hematologic recovery. The arrows indicate platelet transfusions.

in accelerated or blastic phase, incomplete post-BMT tri-lineage hematopoietic recovery, palpable splenomegaly (> 4 cm), early procedure-related death, severe post-BMT infectious complications, major ABO donor-recipient mismatch, T-cell-depleted marrow and pre-BMT platelet refractoriness were excluded from the analysis, leaving 18 patients. Their transfusion requirements during the first 45 days after infusion were reviewed, with the following results: mean/median (range) 71/50 (21-182) units of platelets and mean/median (range) 7.2/6 (2-30) packed RBC transfusions.

Although the Seattle team clearly demonstrated that splenectomized subjects with CML required significantly fewer platelet transfusions and showed faster rates of platelet and WBC recoveries than nonsplenectomized CML patients [2], the latter group included 21/47 (45%) subjects with moderate or marked splenomegaly. Splenectomy is rarely, if ever, performed prior to BMT nowadays. On the other hand, the transfusion requirements during treatment for acute myelogenous leukemia with a common protocol vary between different institutions [4], suggesting that specific transfusion policies in different institutions play an important role. Thus, we wondered whether our splenectomized patient, who had an uneventful BMT, had transfusion requirements during the procedure much below those of patients with uncomplicated BMT, submitted to similar transfusion policies and with no clinical or laboratory factors known to increase these needs

[5]. All patients received platelet transfusions prophylactically at a dose of 1 unit/10 kg body weight whenever the early morning platelet count was $< 20 \times 10^9/l$ and/or bleeding was present; 2 units of packed RBC were given when the Hb was < 8.0 g/dl. As can be seen, the splenectomized patient received fewer platelet and RBC transfusions than any other of the highly selected patients, suggesting that splenectomy played a relevant role.

Although our limited observations are not surprising, they contribute to the few reports which specifically point out the markedly reduced transfusion needs of splenectomized patients during BMT [2,6]. Despite the more rapid engraftment in splenectomized patients, routine splenectomy prior to BMT is not recommended since it is associated with morbidity, does not improve overall survival [2], and may increase the risk of AGVHD [2, 7].

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