To the Editor:

Transfusion-associated graft-versus-host disease (TA-GVHD) is a well-known complication of blood transfusion in immunocompromised patients. TA-GVHD has recently been described in immunocompetent patients, especially when fresh blood components are used during open-heart surgery. Adams et al\(^1\) have reported previously in *Blood* that small numbers of circulating transfused white blood cells (WBCs) can be detected by the polymerase chain reaction (PCR) analysis of DYZ1 and circulating donor WBCs persist for a mean of 2.0 days in patients receiving an average of 9.3 U of packed red blood cells (PRBCs) or 11.7 U platelets. We now present a very rare case of TA-GVHD after transfusion of stored PRBCs in a patient undergoing surgery for bladder cancer. The diagnosis of TA-GVHD was confirmed by analyzing a variable number of tandem repeat (VNTR) locus of the von Willebrand factor (vWF) gene.

A 73-year-old man was admitted to our clinic because of macroscopic hematuria. He was diagnosed as having transitional cell carcinoma of the bladder by the cystoscopy and cytologic examination of the urine. Because of a progressive anemia, he was transfused with a total of 10 U of stored PRBCs. He underwent total cystectomy and bilateral ureterostomy on April 1, 1992. His postoperative course had been uneventful until day 11, when he suddenly developed high fever, watery diarrhea, and an erythematous, nonpruritic rash spreading over his whole body. He became leukopenic (the WBC count, 0.3 × 10\(^9\)/L) and thrombocytopenic (the platelet count, 3.2 × 10\(^9\)/L) 17 days postoperatively. Other abnormal laboratory findings included the following values: alanine aminotransferase, 200 IU/L, aspartate aminotransferase, 1,181 IU/L; lactate dehydrogenase, 1,181 IU/L; alkaline phosphatase, 504 IU/L; and albumin, 20 g/L. A skin biopsy specimen showed changes typical of acute GVHD and a bone marrow aspirate performed at day 20 revealed marked hypoplasia of all cell lineage. Despite intensive treatment with methylprednisolone and granulocyte colony-stimulating factor and other supportive measures, the patient died of septic shock 14 days after the onset of GVHD.

Patient’s DNA was extracted from bone marrow mononuclear cells and mouthwash cells. To verify the presumptive diagnosis of TA-GVHD, PCR was performed to amplify a VNTR locus of the vWF gene according to the method of Peake et al.\(^2\) The pattern of the amplified fragment obtained from bone marrow cells differed from that from mouthwash cells (Fig 1), which confirmed the diagnosis of TA-GVHD. The HLA typing showed this patient was homozygous with class I antigens (Aw44, B33), which indicated donor blood was HLA-homozygous. This finding was also supportive for the diagnosis of TA-GVHD.\(^3\)

Recently, Kunstmann et al\(^4\) and Blundell et al\(^5\) diagnosed TA-
Fig 1. Photograph of vWF. VNTR bands obtained by PCR of DNA samples separated on 8% polyacrylamide gel. The bands were visualized by incubation of the gel in ethidium bromide solution followed by UV irradiation. Lane 1, Sample from mouthwash of the patient; lane 2, sample from his bone marrow cells after transfusion. Track M contains plasmid \( \phi \times 174RF \) DNA digested with \( Hae \) III (molecular weight marker).

GVHD by PCR analysis of DNA from peripheral blood of patients and donors. The former case was a patient with Hodgkin’s disease receiving chemotherapy, and was therefore considered immunocompromised. The latter was a patient with monoclonal gammopathy and likely reflected some defect(s) in the cellular immune function. TA-GVHD associated with a limited form of bladder cancer after transfusion of stored PRBC has not previously been reported.\(^{57}\) This case indicates that fatal TA-GVHD can occur in an immunocompetent patient transfused with a limited number of stored PRBCs. On this basis, it is recommended that all blood products should be irradiated before transfusion.

REFERENCES

Transfusion-associated graft-versus-host disease after surgery for bladder cancer [letter]