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Brief Report

Acute Thrombotic Thrombocytopenic Purpura Following Orthopedic Surgery

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Release of unusually large von Willibrand factor (UL vWF) multimers and a deficiency of vWF metalloprotease may result in thrombotic thrombocytopenic purpura (TTP), a life threatening disease. Surgery has been associated with TTP, probably by releasing massive amounts of UL vWF. An association between TTP and orthopedic surgery has never been reported in the literature. We report a case of TTP following a total knee replacement surgery in which prior use of ticlopidine might have played a role. J. Clin. Apheresis 17: 133–134, 2002. © 2002 Wiley-Liss, Inc.

Key words: TTP; post-operative TTP; ticlopidine; orthopedic surgery

INTRODUCTION

Thrombotic thrombocytopenic purpura (TTP) is a life threatening clinical syndrome characterized by thrombocytopenia, microangiopathic hemolytic anemia (MAHA), fever, neurological manifestations, and renal insufficiency. The occurrence of TTP following surgery has been well documented. TTP has been described following vascular surgery [1,2], coronary artery bypass grafting, [1,3] renal and liver transplants, [4,5] and abdominal surgeries [6]. However, an association between orthopedic surgery and TTP has never been reported in the literature. We describe a case of TTP, which developed following a total knee arthroplasty in a patient who had recently used ticlopidine. This is the first reported case of TTP complicating an orthopedic surgery. We suggest that the recent use of ticlopidine may have contributed to the development of this unusual complication.

CASE REPORT

A 52-year-old female with hypertension and severe degenerative joint disease was admitted to the hospital for right knee replacement surgery. In the past, she underwent cholecystectomy, hysterectomy, and carpal tunnel release surgery without complications. Prior to surgery she was taking atenolol, lorazepam, and diphenhydramine. Although she had taken ticlopidine for 2 months, the drug was discontinued 2 days prior to the surgery. The hemogram 1 day prior to surgery showed a hemoglobin of 10.6 g/dl, a white blood cell count of 12,600/mm^3 with normal differential, and a platelet count of 465,000/mm^3. The blood urea nitrogen was 10 mg/dl and the creatinine was 0.9 mg/dl. A total right knee arthroplasty was performed without acute surgical complication. Postoperatively, low molecular weight heparin was begun for deep venous thrombosis prophylaxis. On the 1st post-operative day, she developed a fever to 100.4°F and continuous bleeding from the surgical site. On the 2nd post-operative day, her temperature increased to 101.4°F. A hemogram revealed a white blood cell count of 26,000/mm^3 with 79% segmented neutrophils and 20% band forms, a hemoglobin of 10.1 gm/dl, and a platelet count of 69,000/mm^3. The reticulocyte count was 4.9%. The blood urea nitrogen was 33 mg/dl, the creatinine was 3.0 mg/dl, and bilirubin was 2.1 mg/dl. The lactate dehydrogenase markedly increased to 1,026 U/L, and haptoglobin decreased to 19 mg/dl (normal range 25–200 mg/dl). Review of a peripheral blood smear revealed numerous schistocytes and thrombocytopenia with giant platelets. The prothrombin time was 14.8 seconds and the activated partial thromboplastin time was 36 seconds. Urinalysis and x-ray were unremarkable. Blood cultures were negative. Low molecular weight heparin was discontinued. The diagnosis of TTP was established on the basis of the clinical presentation of thrombocytopenia, MAHA, unexplained fever, and

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acute renal failure. Exchange plasmapheresis (EP) was begun with prompt improvement of thrombocytopenia, MAHA, and renal insufficiency. Platelet factor 4-associated heparin-dependent antibody could not be detected. Following four EPs, all manifestations of TTP had completely resolved and the patient has since been well.

DISCUSSION

The recent demonstration of autoantibodies to von Willibrand factor (vWF) cleaving metalloprotease enzyme in patients with classic TTP has clarified the pathogenesis of this life-threatening illness [7]. The presence of this antibody inhibits the cleaving of unusually large molecular weight vWF multimers (UL vWF), resulting in uncontrolled systemic platelet activation. Formation of platelet thrombi in the microvasculature initiates the clinical syndrome of TTP.

Acute TTP complicating vascular and abdominal surgical interventions has been well described [1–6]. Although the mechanism of post-surgical TTP remains to be precisely defined, it is likely the result of the release of massive amounts of UL vWF multimers from damaged endothelium, overwhelming the capacity of the available vWF cleaving metalloprotease enzyme.

Our case is the first reported instance in which TTP developed following an orthopedic procedure. We believe that this may have occurred as a result of the recent preoperative use of ticlopidine, which has been associated with the development of TTP by forming an antibody to vWF cleaving metalloprotease [8]. Although our patient was clinically well and hematologically normal just prior to surgery, she may have had marginal levels of vWF cleaving enzyme secondary to the recent use of ticlopidine, predisposing her to the development of TTP following a relatively small amounts of endothelial damage that occurred during a knee replacement procedure. Assay for detecting an anti-vWF cleaving enzyme antibody was not performed since it was not available at our institution.

We have described an instance of TTP complicating an orthopedic surgical procedure. Predisposition to the development of this life-threatening complication may have resulted from antecedent use of ticlopidine. We suggest that physicians of all specialties be alert to the possibility of postoperative TTP and be familiar with drugs that may increase the risk of this entity. Prompt recognition and treatment may prevent serious morbidity and mortality.

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