Ruptured Cerebral Aneurysm Successfully Clipped in Idiopathic Thrombocytopenic Purpura After High-dose Gamma-globulin Therapy
—Case Report—

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Abstract
A ruptured cerebral aneurysm in a 50-year-old female with idiopathic thrombocytopenic purpura was successfully clipped after preoperative high-dose gamma-globulin therapy to control the hemorrhagic diathesis. High-dose gamma-globulin therapy with or without steroid and/or platelet transfusion is recommended for such cases if the blood pressure can be controlled and the neurological condition permits delayed surgery.

Key words: high-dose gamma-globulin therapy, idiopathic thrombocytopenic purpura, subarachnoid hemorrhage

Introduction
Neurosurgical intervention in patients with idiopathic thrombocytopenic purpura (ITP) is rare because intraoperative bleeding is difficult to control. Three of eight reported operations on ITP patients with intracranial hematoma resulted in peri- or postoperative death. Control of the hemorrhagic diathesis in ITP patients is most important to achieve satisfactory results.

We report the successful clipping of a ruptured cerebral aneurysm in an ITP patient after preoperative high-dose gamma-globulin therapy. The effectiveness of this therapy and the approach to such patients are discussed.

Case Report
A 50-year-old female had received steroid therapy for ITP for 15 years. She suffered sudden onset of a severe headache on October 5, 1989.

On admission, she was somnolent and the bilateral ocular fundi showed some retinal bleeding. No other neurological abnormality was found. Precontrast computed tomographic (CT) scans demonstrated a subarachnoid hemorrhage (Fig. 1). Emergency cerebral angiography identified a bizarre-shaped right middle cerebral artery aneurysm (Fig. 2). The platelet count was $4.4 \times 10^9$/mm$^3$ and bleeding time was 14.5 minutes (Table 1). High-dose gamma-globulin infusion therapy (20 gm/day for 5 days) was given to rapidly increase the platelet count in prepara-

Fig. 1 Precontrast CT scans on admission showing a subarachnoid hemorrhage.
tion for surgery (Fig. 3). The platelet count increased to $7.9 \times 10^4$ and the bleeding time decreased to 5 minutes on October 9. However, 30% of the platelets were large enough to be equivalent to two small platelets. Therefore, the actual equivalent platelet count was $10.3 \times 10^4$. The aneurysmal neck was clipped on October 9 with 500 ml estimated blood loss.

Postoperative course was uneventful and the platelet count remained at more than $10 \times 10^4$ until October 20. Follow-up cerebral angiography demonstrated the clipped aneurysm and a mild cerebral arterial spasm (Fig. 4). She was discharged without neurological deficits on October 31, 1989.

She received a splenectomy on March 1, 1990 to decrease the required steroid dosage after preoperative high-dose gamma-globulin therapy. However, her platelet count was only $8 \times 10^4$ on April 11, 1990.

Her platelet count gradually increased with 15 mg prednisolone up to $31.3 \times 10^4$ in August 1990, and thereafter ranged from 9 to $22.7 \times 10^4$ with 10-15 mg of prednisolone.

<table>
<thead>
<tr>
<th>Table 1</th>
<th>Hematological data</th>
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<tr>
<td></td>
<td>Hospital day</td>
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<tr>
<td></td>
<td>Day 1</td>
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<tr>
<td>RBC ($\times 10^5$/mm$^3$)</td>
<td>439</td>
</tr>
<tr>
<td>WBC ($\times 10^5$/mm$^3$)</td>
<td>161</td>
</tr>
<tr>
<td>Platelet ($\times 10^5$/mm$^3$)</td>
<td>4.4</td>
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<tr>
<td>Bleeding time (min)</td>
<td>14.5</td>
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RBC: red blood cell, WBC: white blood cell.

Discuss **ion**

The platelet count in ITP patients can be increased by steroids, immunosuppressant agents, splenectomy, platelet transfusion, and high-dose gamma-globulin therapy.
globulin therapy. Steroids and immunosuppressant agents cannot achieve an increase adequate to control intraoperative bleeding. Humphreys et al. performed emergency splenectomy followed by platelet transfusion in four ITP cases with intracerebral hematoma and achieved good postoperative results. However, a splenectomy is only 50-85% effective.

Our patient later received splenectomy, but the platelet count did not increase adequately. Platelet transfusion will increase the platelet count but the effect is temporary and results in formation of antiplatelet antibodies.

Cerebral aneurysm, as in our case, does not always require immediate surgery unlike intracranial hemorrhage with cerebral herniation, so the operation can be delayed until the hemorrhagic diathesis can be controlled.

Imbach et al. introduced high-dose gammaglobulin therapy (400 mg/kg/day for 5 days) in 1981. The resultant platelet count increase was adequate to tolerate surgery within a few days and remained effective for about a week. Gamma-globulin operates by 1) overloading the reticuloendothelial system to reduce platelet destruction, and 2) inhibition of antiplatelet antibody binding to the platelets.

Our patient’s neurological condition was good and the cause of bleeding was a ruptured intracranial aneurysm, not hemorrhagic diathesis. We therefore selected high-dose gamma-globulin therapy followed by delayed aneurysm clipping.

No cases of cerebral aneurysm associated with ITP have previously been reported. We believe that the association of cerebral aneurysm and ITP was incidental in this case. The management of ITP patients with ruptured cerebral aneurysm has never been discussed. We recommend preoperative high-dose gamma-globulin therapy with or without steroid and/or platelet transfusion followed by delayed surgery after the hemorrhagic diathesis is completely controlled.

References


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