Rupture of posterior inferior cerebellar artery aneurysm into the subarachnoid space during angiography

Case report

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The author reports a case of angiographically-demonstrated aneurysmal rupture, and reviews related reports.

KEY WORDS • posterior inferior cerebellar artery • aneurysm • subarachnoid extravasation • angiography

The following is a report of a vertebrobasilar system aneurysm that leaked into the subarachnoid space during angiography; delayed films show the contrast material filling the posterior aspect of the third ventricle.

Case Report

A 56-year-old woman was admitted in a semiconscious state following a severe headache.

Examination. Examination showed minimal response to painful stimulation; her neck was stiff, and she was unable to move the right eye past the midline. She had a decreased right corneal reflex, no gag reflex, and bilaterally positive Babinski’s reflex. A lumbar puncture was not done. A diagnosis of subarachnoid hemorrhage was made, and carotid and vertebral angiography were immediately performed.

Angiographic Examination. Both carotid arterial circulations were studied by selective internal carotid artery catheterization: Conray 60, 10 ml/sec, was injected into each internal carotid artery percutaneously through a Torcon Headhunter Catheter I,* 100 cm long, 6.5 F, lumen 1.09 mm end hole catheter, at 300 psi, via the right femoral artery. No aneurysm was demonstrated. The patient began to show signs of apnea following the internal carotid artery injections. Intubation was immediately performed and her respiration assisted; the blood pressure

*Torcon Headhunter Catheter I manufactured by Cook Incorporated, 925 South Curry Pike, P.O. Box 489, Bloomington, Indiana 47401.
remained stable and the pulse rate rose to 100. Selective catheterization of the left vertebral artery was performed; 7 ml/sec of Conray 60 was injected at 300 psi. Again, no aneurysm was seen, but there was slow flow and poor filling of the vertebrobasilar system (Fig. 1). The left vertebral artery showed an area of narrowing proximal to the origin of the left posterior inferior cerebellar artery (PICA), believed to represent arterial spasm as a result of the subarachnoid hemorrhage. The right vertebral artery was then immediately selectively catheterized and 7 cc of contrast medium injected at 300 psi. This revealed gross subarachnoid extravasation of the contrast medium into the cisterna magna and right cerebellopontine angle cistern; Conray appeared to fill the fourth ventricle and posterior aspect of the third ventricle (Fig. 2). A saccular aneurysm was now seen in the region of the PICA and was believed to represent the site of aneurysmal rupture.

The patient died approximately 2 hours following the angiographic examination.
Rupture of PICA aneurysm during angiography

**TABLE 1**

Reported cases of extravasation from intracranial aneurysms at angiography

<table>
<thead>
<tr>
<th>Author, Year</th>
<th>Artery of Extravasation*</th>
<th>Contrast Agent and Dosage</th>
<th>Pressure</th>
<th>Survival</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gerlock, 1975</td>
<td>rt PICA</td>
<td>Conray 60, 7 ml</td>
<td>300 psi</td>
<td>died</td>
</tr>
<tr>
<td>Goldstein, 1967</td>
<td>rt post. comm.</td>
<td>Renografin 60, 8 ml</td>
<td>hand inj.</td>
<td>died</td>
</tr>
<tr>
<td>Hoff &amp; Potts, 1969</td>
<td>basilar</td>
<td>50% Hypaque, 6 ml</td>
<td>hand inj.</td>
<td>died</td>
</tr>
<tr>
<td>Jackson, <em>et al.</em>, 1960</td>
<td>rt supraclin.</td>
<td>50% Hypaque, 5 ml</td>
<td>—</td>
<td>died</td>
</tr>
<tr>
<td>Jamieson, 1954</td>
<td>rt mid. cerebral</td>
<td>Uridone, 15 ml</td>
<td>—</td>
<td>died</td>
</tr>
<tr>
<td>Jenkinson, <em>et al.</em>, 1954</td>
<td>rt supraclin.</td>
<td>35% Diodrast, 8 ml</td>
<td>—</td>
<td>died</td>
</tr>
<tr>
<td>Lehrer, <em>et al.</em>, 1972</td>
<td>ant. comm.</td>
<td>50% Hypaque, 50 ml, brachial inj.</td>
<td>400 psi</td>
<td>died</td>
</tr>
<tr>
<td>Murphy &amp; Goldberg, 1967</td>
<td>rt supraclin.</td>
<td>50% Hypaque, 15 ml</td>
<td>hand inj.</td>
<td>died</td>
</tr>
<tr>
<td>Triska, 1962</td>
<td>mid. cerebral</td>
<td>60% Urografín</td>
<td>—</td>
<td>died</td>
</tr>
<tr>
<td>Vines &amp; Davis, 1971</td>
<td>rt post. comm.</td>
<td>Conray 60, 9 ml</td>
<td>200 psi</td>
<td>alive</td>
</tr>
</tbody>
</table>

* PICA = posterior inferior cerebellar artery.

**Discussion**

Extravasation of contrast material during angiography of carotid circulation aneurysms is a rare complication. Fortunately, it is even rarer from the vertebrobasilar circulation. Hoff and Potts reported leakage of contrast material following vertebral angiography in a patient with an arteriosclerotic aneurysm of the basilar artery; the contrast material appeared to pass from the subarachnoid space into the fourth ventricle via the right foramen of Luschka.

There have been many case reports of ruptured aneurysms in which the extravasation was demonstrated by angiography. The majority of these aneurysms have been in the carotid circulation (Table 1), which is not surprising if 80% of berry aneurysms occur there. What is surprising is the readiness with which the performance of angiography has been accepted as an etiological factor in causing these aneurysms to rupture. However, all of the patients listed in Table 1 had had clinical signs and symptoms of subarachnoid hemorrhage and were seriously ill prior to the performance of angiography. Perhaps then, the extravasated contrast material seen in our case as well as others serves only to diagnose the site of a bleeding aneurysm, rather than to represent rupture of the aneurysm because of the arterial injection. Bakay and Sweet found no increase in internal carotid artery pressure in five patients when a 10 to 12 ml bolus was injected into the common carotid artery in 2 to 3 seconds.

One certainly should not ignore the deleterious effects of repeated heparin solution flushings through catheters opening into the internal carotid and vertebral arteries, or the vasodilating effect of the contrast medium itself. Clinical observation of reflux of injected contrast material into the opposite vertebral artery or various portions of the circle of Willis during an arterial injection may also be important. Until these factors have been completely investigated, extravasation from an aneurysm at the time of angiography probably should be regarded only as a bad prognostic sign rather than the result of the procedure.


References


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