CT POSITIVE-ANGIOGRAPHY NEGATIVE ACOA ANEURYSMS: REPORT OF TWO CASES

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SUMMARY :

Although the localization of sacular aneurysm, which are the most frequent cause of subarachnoid haemorrhage, is determined exactly with cerebral angiography, the false negative angiography rate varies from 10 to 25 %. Thrombosis, vasospasm and a number of other factors have an effect on false negative angiographic appearances. Two patients with aneurysm that could not be seen on initial cerebral angiography were taken to operation depending solely on computerized tomography and clinical findings. The causes of false negative angiographic appearances are briefly summarized in the light of the pertinent cases.

KEY WORDS:

Cerebral angiography, False negative cerebral angiography, Intracranial aneurysm, Subarachnoid haemorrhage.

INTRODUCTION

The localization of saccular aneurysm is determined by angiography. Cranial computerized tomography (CT) is a valuable imaging technique in patients with subarachnoid haemorrhage either as an initial study or as an adjuvant to angiography (4). In various series, the percentage of angiograms that did not show aneurysm or arteriovenous malformation varies from 10 to 25 % (2,8,9). Reviewing the literature we could find only four reported cases that were operated relying CT findings (7). In this paper we present two ACoA aneurysm cases whose angiograms did not reveal aneurysm.

CASE REPORTS

Case 1: This 35-year-old normotensive male patient lost consciousness for 15 minutes after diving. On admission, six days after the initial event, examination revealed only neck stiffness and left hemiparesis (WFNS:3*). Cranial CT showed blood in the interhemispheric fissure and in front of the third ventricle (Fig 1a). Routine blood analysis and physical examination revealed no abnormality.

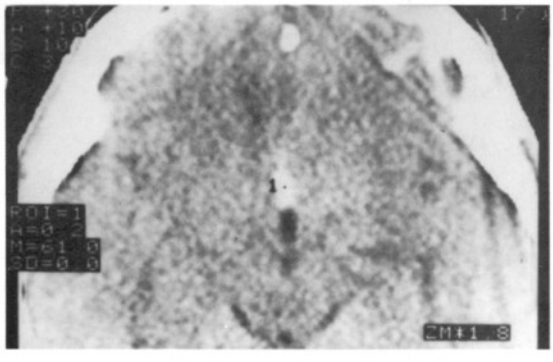

Fig 1a : Cranial CT of the first case showing blood in front of third ventricle.

On right carotid angiography, an aneurysm was noted in the region of the right middle cerebral artery (MCA), and vasospasm was seen in the right proximal anterior cerebral artery, the initial part of the middle cerebral artery and the internal carotid artery bifurcation (Fig 1b,c). On the fifth day of admission he was operated via the right pterional route and initially the ACoA region was explored. In the chiasmatic cistern there were adhesions and xantochromy due to haemosiderine. First the neck of the ACoA aneurysm where the dome was directed posteriorly and in diameters of 1×1.2 cm and then, the neck of the MCA aneurysm clipped. On postoperative carotid angiograms, the aneurysms could not be visualised. The patient was discharged with a Glasgow outcome score of 1 and one year postoperatively neurological examination was normal.

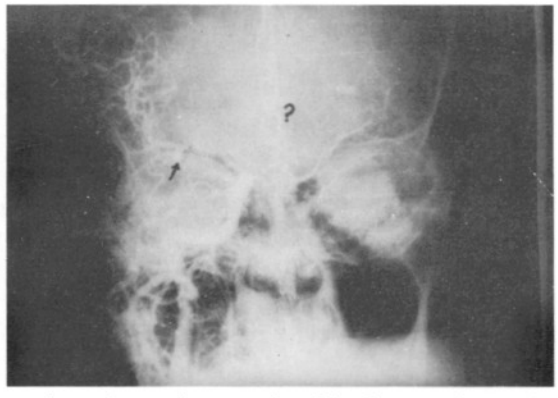

Fig 1b : Right carotid angiography of the first case showing the aneurysm at the initial part of the MCA but ACoA can not be visualized.

(*) WFNS : World Federation of Neurological Surgeons (3)

Fig 1c : Right carotid angiography of the first case. ACoA aneurysm can not be visualized.

Case 2: Following two subarachnoid attacks a 53-year-old hypertensive male patient was transferred to this hospital. On initial examination he was drowsy and had right sixth cranial nerve palsy and hemiparesis with positive Babinski sign (WFNS:3).

Routine blood analysis was within normal limits. Cranial CT showed blood especially in the interhemispheric supraclinoid and Sylvian cisterns. It also showed enhancement of a hyperdense area in the region of ACoA after contrast injection (Fig 2a). Four vessel angiograms did not revealed any aneurysm (Fig 2b,c,d). On the third day of bleeding an explorative operation was performed via a right pterional route, depending solely on the CT findings, and the neck of the aneurysm whose dome was 1 cm in diameter and directed upward near the left corner was clipped. There were three A_2 and fenestrated ACoA. The postoperative course was uneventful and the right hemiparesis began to regress. Control angiography showed that the aneurysm did not fill. Six months postoperatively the patient had no neurological abnormality.

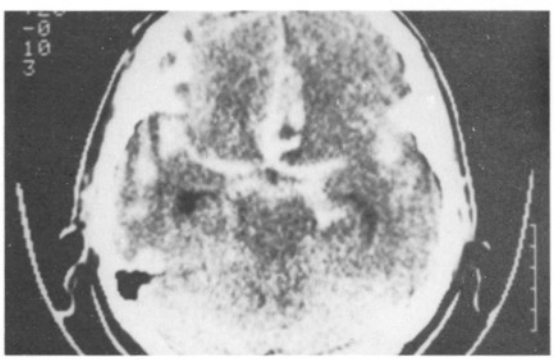

Fig 2 a : Cranial CT of the second case showing blood especially in the interhemispheric and Sylvian cisterns.

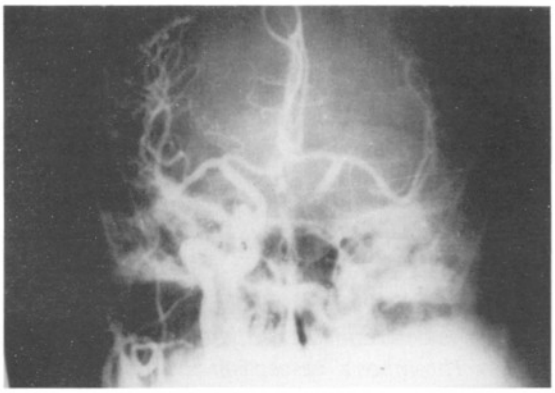

Fig 2b : Proeoperative angiogram of the second case which did not reveal an aneurysm.

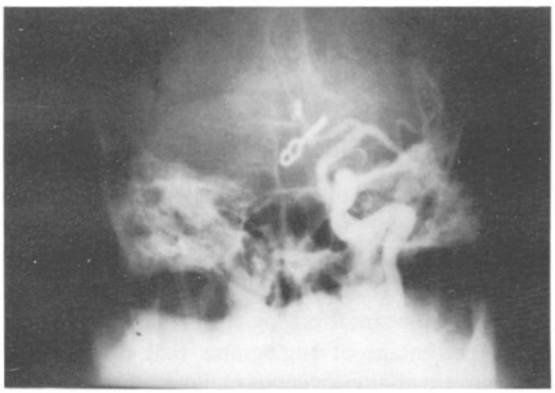

Fig 2c : Right carotid angiogram of the second case. ACoA aneurysm can not be seen.

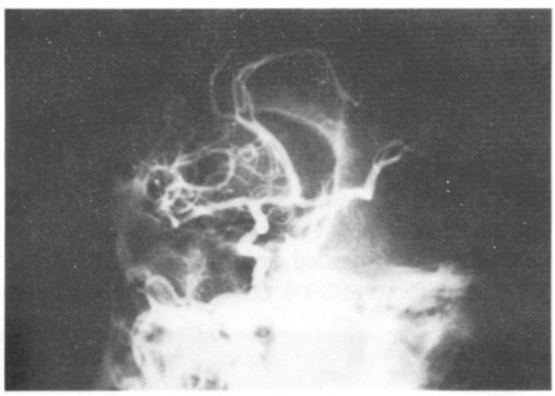

Fig 2d : Oblique view of the same angiogram.

DISCUSSION

The incidence of false-negative angiographic appearances for aneurysm is reported as between 10 % and 25 % (2,8). Though the source of bleeding was not shown on the initial angiograms, it was demonstrated at follow up angiography (2,5,10). Reasons for false-negative angiographic results are shown in table 1 (1,2,5,8).

Table 1: Reasons for false-negative angiography

1. Thrombosis of the aneurysm.
2. Small lesion.
3. Vasospasm.
4. Misinterpretation.
5. Technical factors.
6. Narrowness of the aneurysm neck.
7. Variations in blood flow.
8. Antifibrinolytic theraphy.

In our first case, blood in the interhemispheric fissure and in front of the third ventricle suggested that it might be an ACoA aneurysm, but the angiogram revealed only an MCA aneurysm. Though angiography did not show the ACoA aneurysm, the CT findings directed us to first explore the ACoA region. For the second case, distribution of blood in the midline cisterns and hyperdensity in the ACoA localization were the CT findings which also directed us to explore the ACoA region.

The reason why the aneurysm could not be demonstrated was vasospasm and inadequate multiplanar views for the first and the second case respectively. In both cases CT guided us.

The common concept is to repeat angiography after 3 weeks if an aneurysm can not be identified in the first angiogram. Because of vasospasm (frequently beginning on the fourth day of bleeding), early diagnosis and treatment of an aneurysm before vasospasm has developed are important. For this reason the two cases presented here were operated on without waiting for follow-up angiograms.

For some cases CT is an important tool, and if the surgeon wishes to avoid vasospasm and its end results, decision-making on aneurysm surgery be necessitates detailed interpretation of CT findings especially if there is no angiographic evidence of aneurysm.

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