

## Role of repeat digital subtraction angiography in non traumatic subarachnoid hemorrhage:

### Early detection of recanalisation of the spontaneously thrombosed aneurysm

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#### INTRODUCTION

Ruptured intracranial aneurysms accounts for major cause of non traumatic subarachnoid haemorrhage (SAH). Digital subtraction angiography (DSA) is the gold standard for detection of the aneurysm. There were several reports that described about the rate of false negative findings on the angiography. (1,2,3,4,5)

One of the main causes described in the literature is false negative angiography in aneurismal SAH was spontaneous thrombosis. (6) Hence repeat angiography is mandatory in all the cases of initially angiographically negative nontraumatic SAH.

We present three patients of aneurismal SAH with an initial negative angiogram, where subsequent repeat angiography done after 3 weeks in all the three patients revealed the presence of aneurysm. All these aneurysms detected on the repeated second angiogram were treated successfully by endovascular coiling with good clinical outcome. The aim of the present paper is to emphasize the importance of repeat DSA in patients who pre-

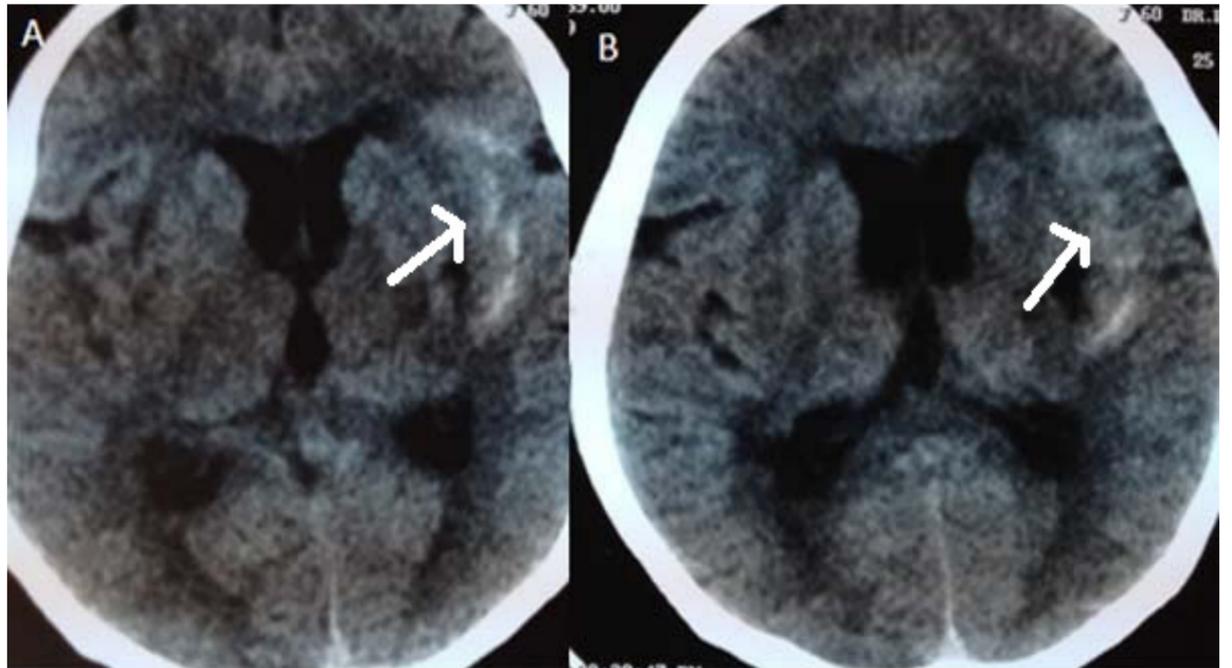


Figure 1A and 1B: CT scan showing SAH in left sylvian fissure(A,B)

sented with spontaneous SAH and in whom initial angiogram was negative.

DSA is considered the gold standard in the detection of the aneurysms. Though CT angiography can be done as an alternative, it often fails to detect 1/3 of the aneurysms < 6mm (7,8,9)

#### CASE SERIES

In our present case series all the aneurysms not seen on initial angiography were detected on repeat angiography done after 3 weeks.

#### Case 1: (Figure 1)

A 53 year old right handed lady who was a known hypertensive presented with sudden onset headache. CT scan (Figure 1) done on the same day revealed blood in left sylvian fissures. Subsequently DSA was done and no aneurysm was detected. We advised repeat angiography after 3 weeks. The interval angiogram showed left MCA bifurcation (5x2mm) aneurysm, which was pointing medially and inferiorly. Endovascular coiling was performed with complete exclusion of the aneurysm from the circulation (see Figure 1 F)



Figures 1 C, D, E and F

Initial DSA showing no aneurysm(C), Repeat DSA showing MCA bifurcation aneurysm(D) which was coiled(E) and post procedure angiogram (F) showing complete exclusion of the aneurysm from the circulation.

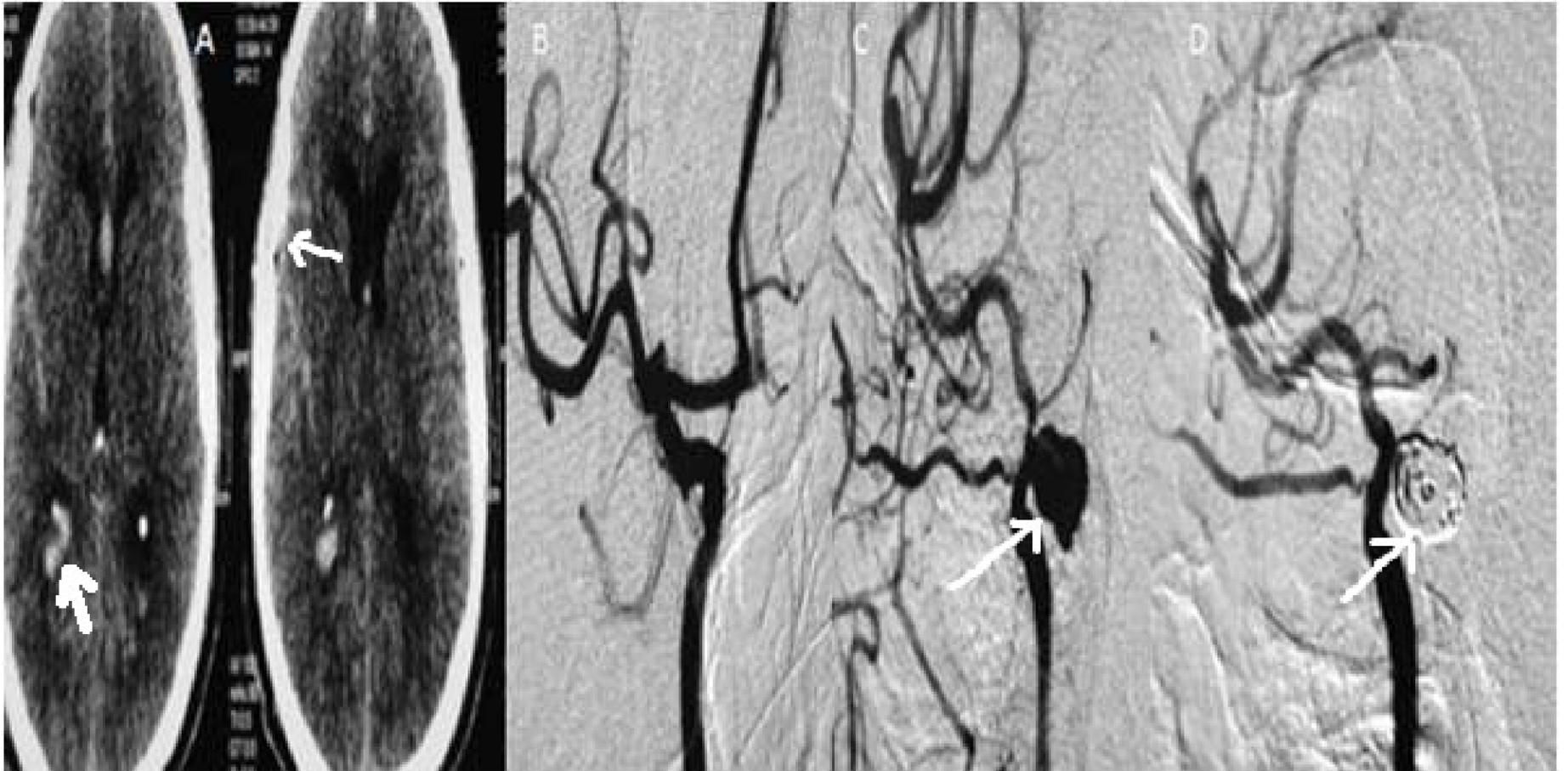


Figure2: CT scan showing diffuse SAH and intraventricular hemorrhage(A), Initial DSA did not reveal any aneurysm(B), Repeat angiogram showing supraclinoid internal carotid artery aneurysm(C), which was subsequently coiled and post procedure angiogram showing exclusion of aneurysm from the circulation(D).

### Case 2: (Figure 2)

A 55 year old right handed lady who was a known hypertensive presented with sudden onset headache and altered sensorium. CT scan revealed blood in the basal cisterns and intraventricular bleed. A subsequent DSA was done and was negative. Repeat angiography after 3 weeks revealed supraclinoid internal carotid aneurysm (12x7mm), which was successfully treated by endovascular coiling.

### Case3: (Figure3)

A 45 year old right handed gentleman with no history of any past medical illness presented with sudden onset thunderclap headache. CT scan revealed anterior interhemispheric fissure bleed. Subsequent DSA was negative and repeat angiogram after 3 weeks interval revealed anterior communicating artery aneurysm, which was successfully coiled with good outcome.

### DISCUSSION

Aneurysm rupture is the commonest cause of the spontaneous SAH. Other causes include trauma, bleeding disorders, cocaine abuse and spinal AVM. (10.)

The pattern of the hemorrhage on the CT scan is important in predicting the prognosis. According to Kaim et al(11) the only situation that does not require a repeat angiography is the perimesenceph-

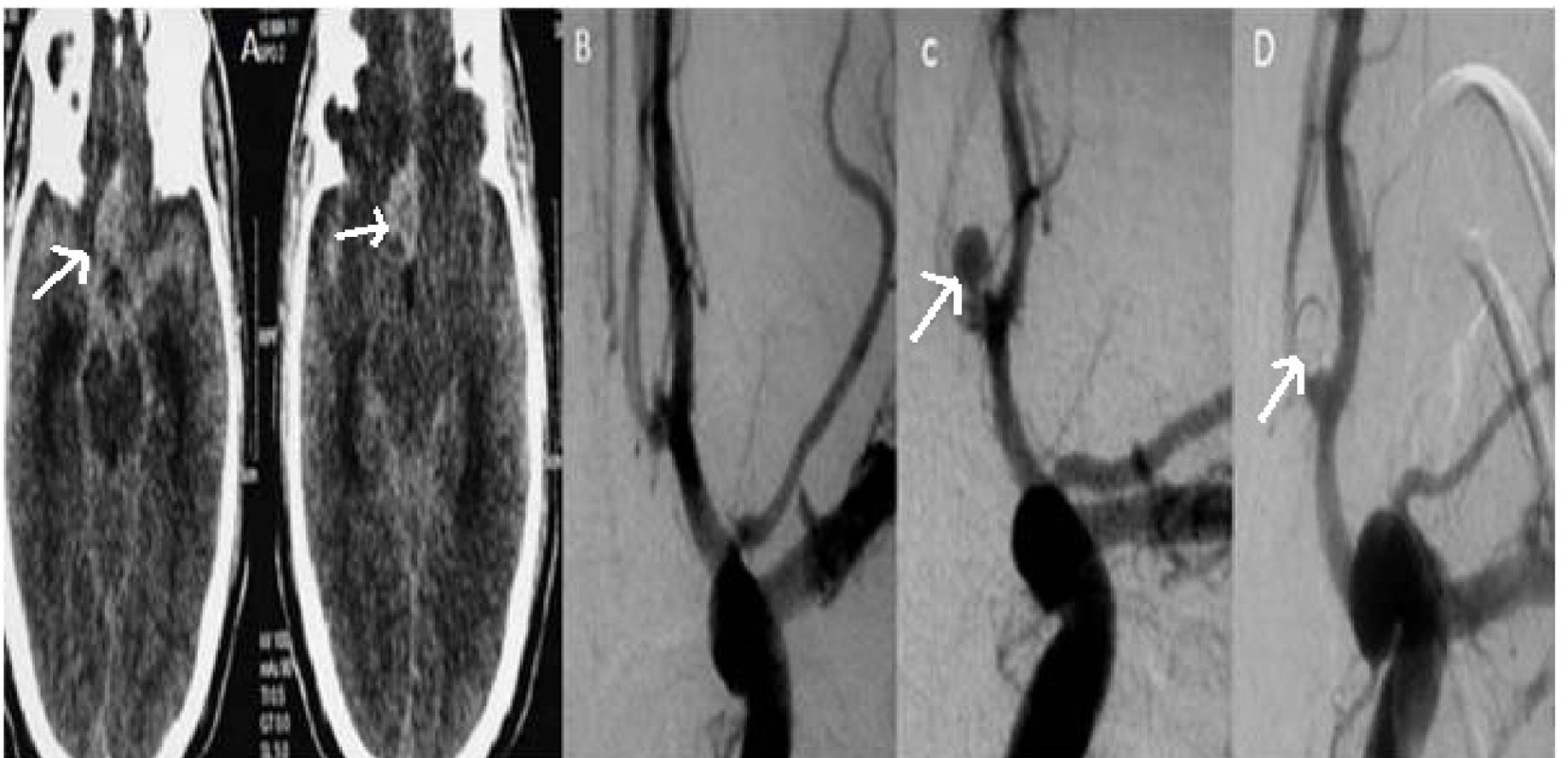


Figure3 (below) : CT scan showing anterior interhemispheric fissure bleed(A), initial angiogram showing an irregular bleb in the anterior communicating artery without any fundus (B), repeat angiogram showed Anterior communicating artery aneurysm with proper sac(C), which was coiled and post procedure angiogram showed complete exclusion of the aneurysm from the circulation.



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atic hemorrhage where centre of bleeding is immediately anterior to the midbrain. However, none of our patients had this pattern of bleed on CT scan and we also agree with these authors that there is no role for repeat angiogram in perimesencephalic pattern of SAH which is mainly due to venous bleed.

The important causes of non detection of the aneurysms on initial angiogram are vasospasm and aneurismal sac thrombosis. In all the 3 cases in the present case series, initial negative angiograms were technically adequate and also there was no evidence of vasospasm. Aneurysms detected on the second angiogram were not visible retrospectively on the same projection in the first study. Hence we postulate that temporary thrombosis of the aneurysm sac and subsequent recanalisation as the reason for the reappearance of the aneurysm.

DSA is the gold standard (12) and most sensitive technique for evaluation of SAH. CT angiography and MR angiography have a lower sensitivity as compared to DSA. (12,13)

## CONCLUSION

The present report documents 3 cases of aneurismal SAH with initial negative angiogram, which was of adequate technical quality and with no significant vasospasm on angiogram, hence thrombosis is the only explanation in our cases. We emphasize the role of repeat DSA in all the cases of SAH on CT scan, which will help in detection of the early recanalisation of the aneurysm and prevention of the rebleeding and potentially devastating complications.

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