



ELSEVIER

Available online at www.sciencedirect.com

ScienceDirect

journal homepage: www.elsevier.com/locate/radcr

Case Report

Hyperacute intracranial aneurysm rebleed captured on planar and 3D digital subtraction angiography

James R. Waldron*, Matthew Crockett, Tim Phillips

Neurological Imaging and Interventional Service of Western Australia, 8 Hospital Avenue, Nedlands, Western Australia 6009, Australia

ARTICLE INFO

Article history:

Received 15 January 2018

Accepted 1 April 2018

Available online 1 June 2018

Keywords:

Neuroradiology

Interventional radiology

Radiology

Neurology

1. Introduction

Hyperacute rebleeding from aneurysmal subarachnoid hemorrhage is a serious event resulting in high morbidity and mortality [1]. This case study, with its planar and 3D spin angiographic images, emphasizes the importance of urgently securing an acutely ruptured aneurysm in order to prevent secondary rebleeding.

2. Case report

A 43-year-old female presented to a regional hospital an hour after onset of thunderclap headache at 7 am. She had no personal or family history of intracranial aneurysms. Computed tomography (CT) brain and CT intracranial angiogram performed at the regional center demonstrated a Fisher grade 3 subarachnoid hemorrhage, a moderate volume interhemispheric hematoma, and mild hydrocephalus. Blood pressure management was instituted and she was promptly transferred to our care at tertiary referral neurosurgical center for intervention for a suspected culprit aneurysm. Upon presentation to our center at midday, her Glasgow Coma Scale (GCS) was 13 (World Federation of Neurological Surgeons Scale (WFNS) grade 2) and the patient was immediately transferred to the neuroangiography suite. Prior to induction of gen-

* Corresponding author.

E-mail addresses: James.richard.waldron@gmail.com (J.R. Waldron), Crockettmt@gmail.com (M. Crockett), Timothy.john.phillips@gmail.com (T. Phillips).<https://doi.org/10.1016/j.radcr.2018.04.003>1930-0433/© 2018 The Authors. Published by Elsevier Inc. on behalf of University of Washington. This is an open access article under the CC BY-NC-ND license. (<http://creativecommons.org/licenses/by-nc-nd/4.0/>)

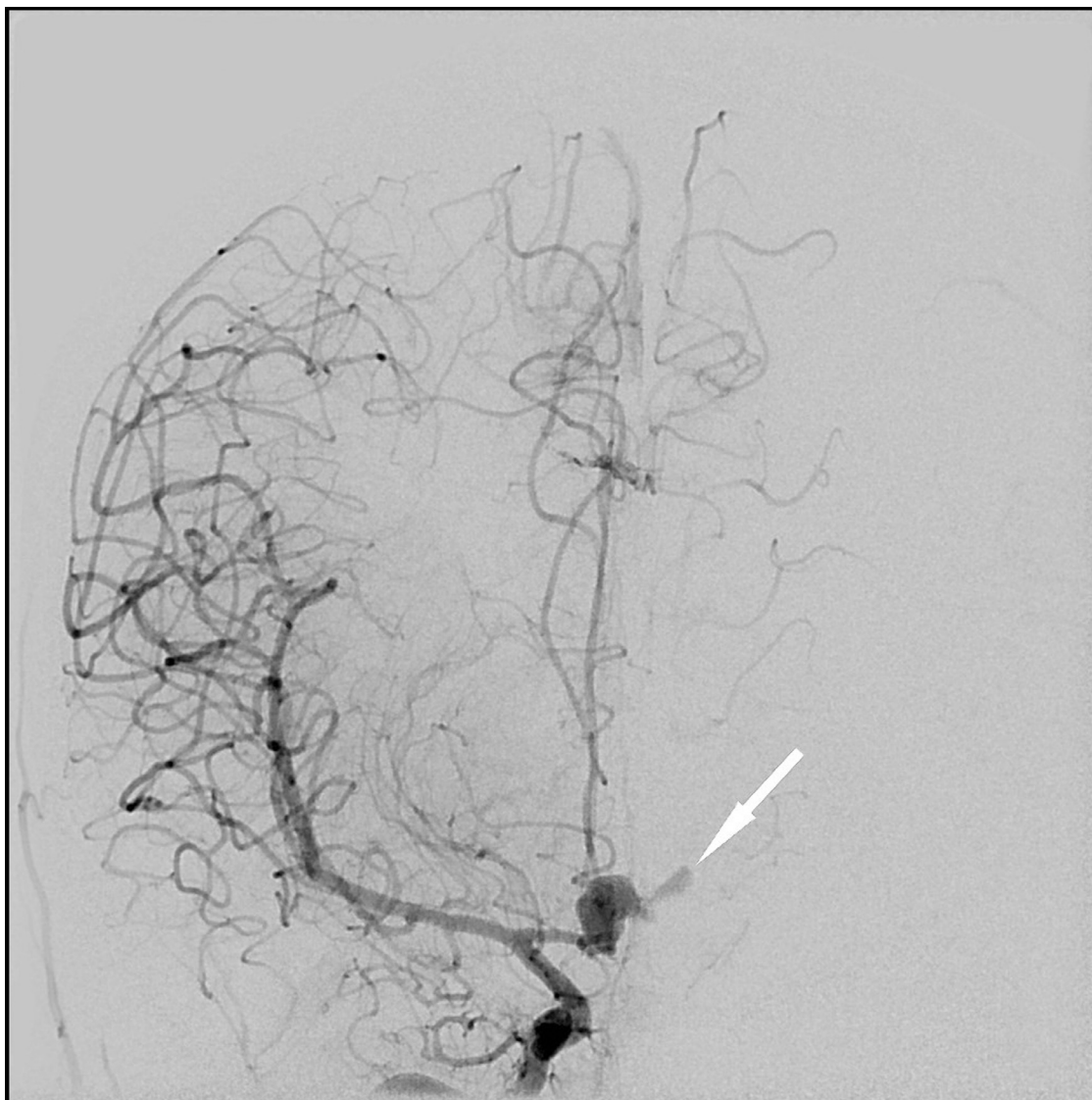


Fig. 1 – Coronal planar cerebral DSA image prior to coiling. The arrow indicates active contrast extravasation from an 11 × 5 × 5 mm anterior communicating artery aneurysm.

eral anesthetic, the patient's headache significantly worsened, which was followed by a loss of consciousness and onset of a generalized tonic-clonic seizure, her GCS dropping to 5 (WFNS grade 5).

Rapid sequence general anesthetic induction was performed followed by an on table cone beam CT which demonstrated enlargement of the interhemispheric hematoma. Access was made via the right Common Femoral Artery (CFA) with a 6.5 Fr catheter, with a 5 Fr catheter advanced into the right proximal cervical Internal Carotid Artery (ICA). Initial planar and 3D spin digital subtraction angiogram demonstrated brisk extravasation of contrast from a large 11 × 5 × 5 mm anterior communicating aneurysm with very early vasospasm affecting the Anterior Cerebral Artery (ACA) system (Figs. 1 and 2, Video 1).

Using a system of a 6 Fr Envoy guide catheter (Deputy Synthes, MA, USA), 017 Headway 17 microcatheter (Microvention,

CA, USA), 014 Traxcess microwire (Microvention, CA, USA), 4 mm × 7 mm Hyperform balloon (Medtronic, Dublin, Ireland), 7 Axiom coils of various sizes (Medtronic, Dublin, Ireland), the aneurysm sac was packed with no distal embolization or branch occlusion with balloon assistance (Fig. 3). An unruptured left M1 middle cerebral artery aneurysm was additionally identified (Fig. 4). The right CFA accessed was closed with a 6 Fr Angioseal device at 4 pm.

Following endovascular coiling, the patient was transferred to theatre for extraventricular drain insertion by the on-call neurosurgical team. She was subsequently relocated to intensive care unit where she remained for 7 days. She underwent a total of four endovascular treatments for intracranial vasospasm; however, she eventually recovered and progressed to a rehabilitation facility a month following her original subarachnoid hemorrhage with mild cognitive but no focal neurological deficit. She underwent a repeat DSA and coiling of

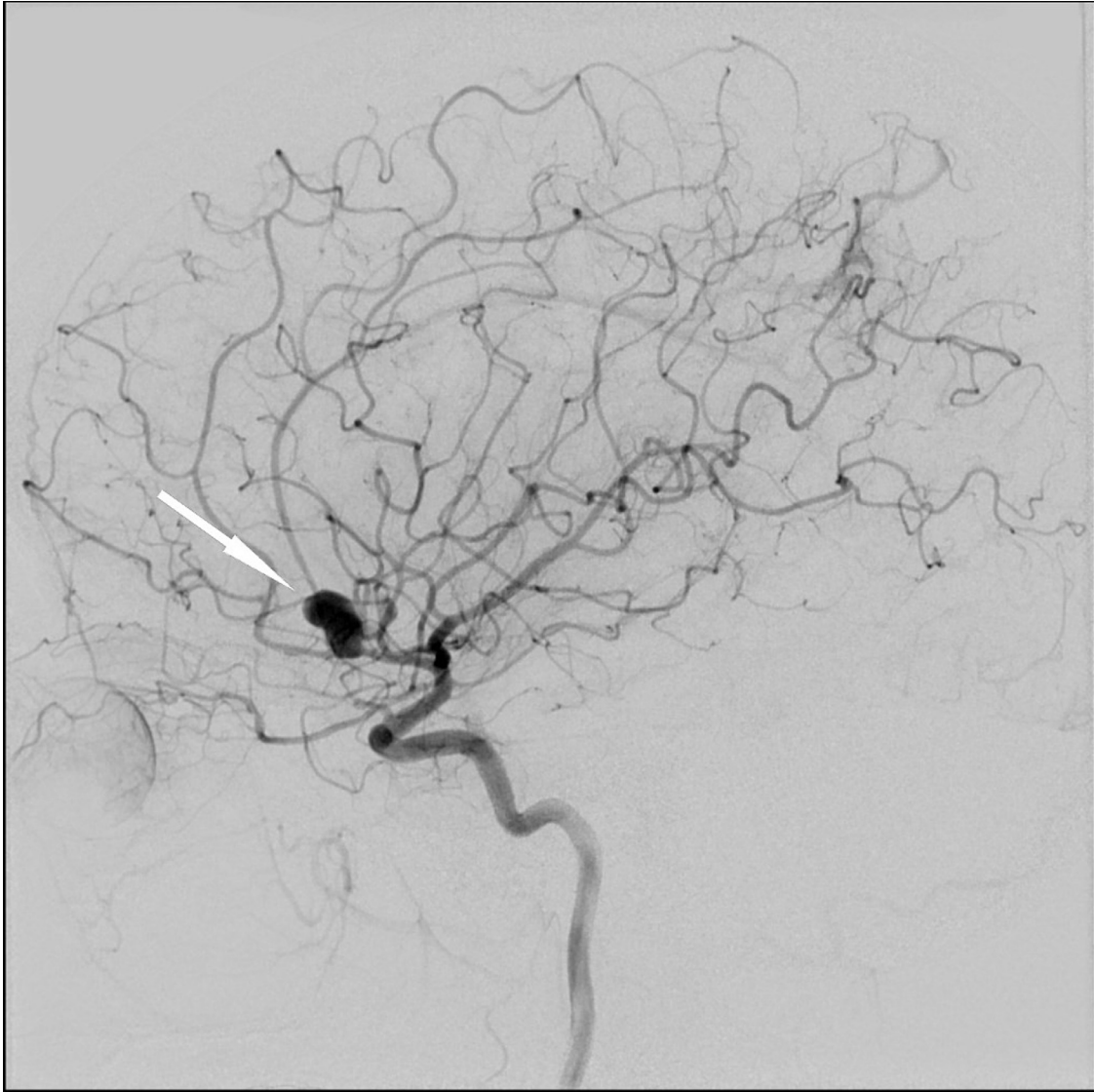


Fig. 2 – Sagittal planar cerebral DSA image prior to coiling. The arrow identifies the large 11 x 5 x 5 cm anterior communicating artery aneurysm in the sagittal plane, without active contrast extravasation.

her left M1 aneurysm 4 months following her admission. At 6 months following discharge the patient was independent with an modified Rankin Score (mRS) of 0 and no residual neurological or cognitive deficits.

3. Discussion

Aneurysmal hyperacute rebleeding is a phenomenon associated with poor clinical outcomes, usually occurring within the first 6 h following initial subarachnoid bleed, known as the “hyperacute” phase [2]. Some studies report a hyperacute re-

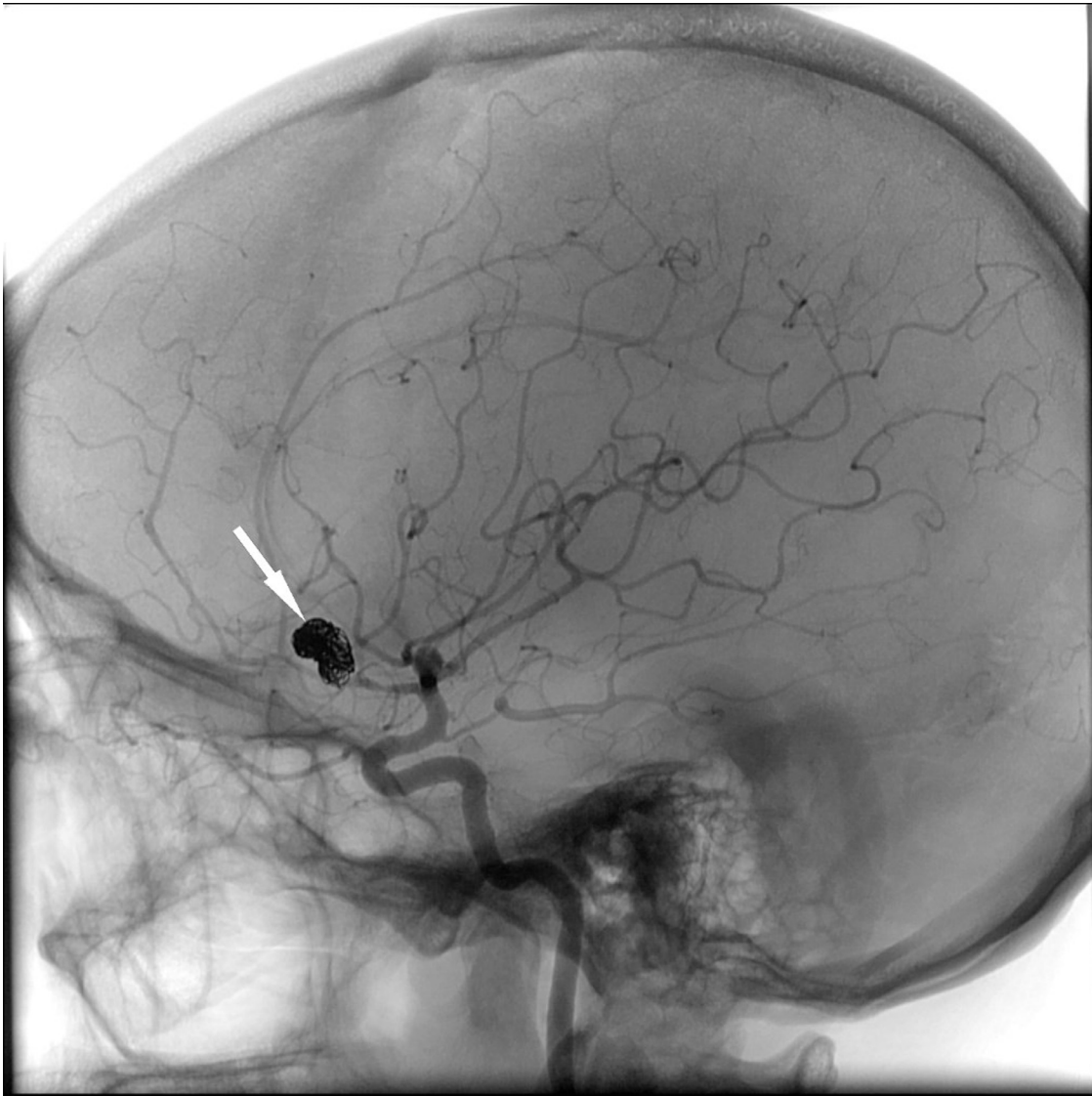


Fig. 3 – Sagittal planar cerebral DSA following coiling. The arrow identifies the successfully coiled anterior communicating artery aneurysm with 7 Axiom coils of various sizes.

bleeding occurrence of 10% of all aneurysmal subarachnoid hemorrhages, with mortality as high as 50% [1]. Risk factors

that tend to associate with rebleeding include high systolic blood pressure, intracerebral or intraventricular hematomas, posterior circulation aneurysms, and aneurysm >10 mm in size [2].

However, patients with initially good neurological status who rapidly deteriorate can still have positive clinical out-

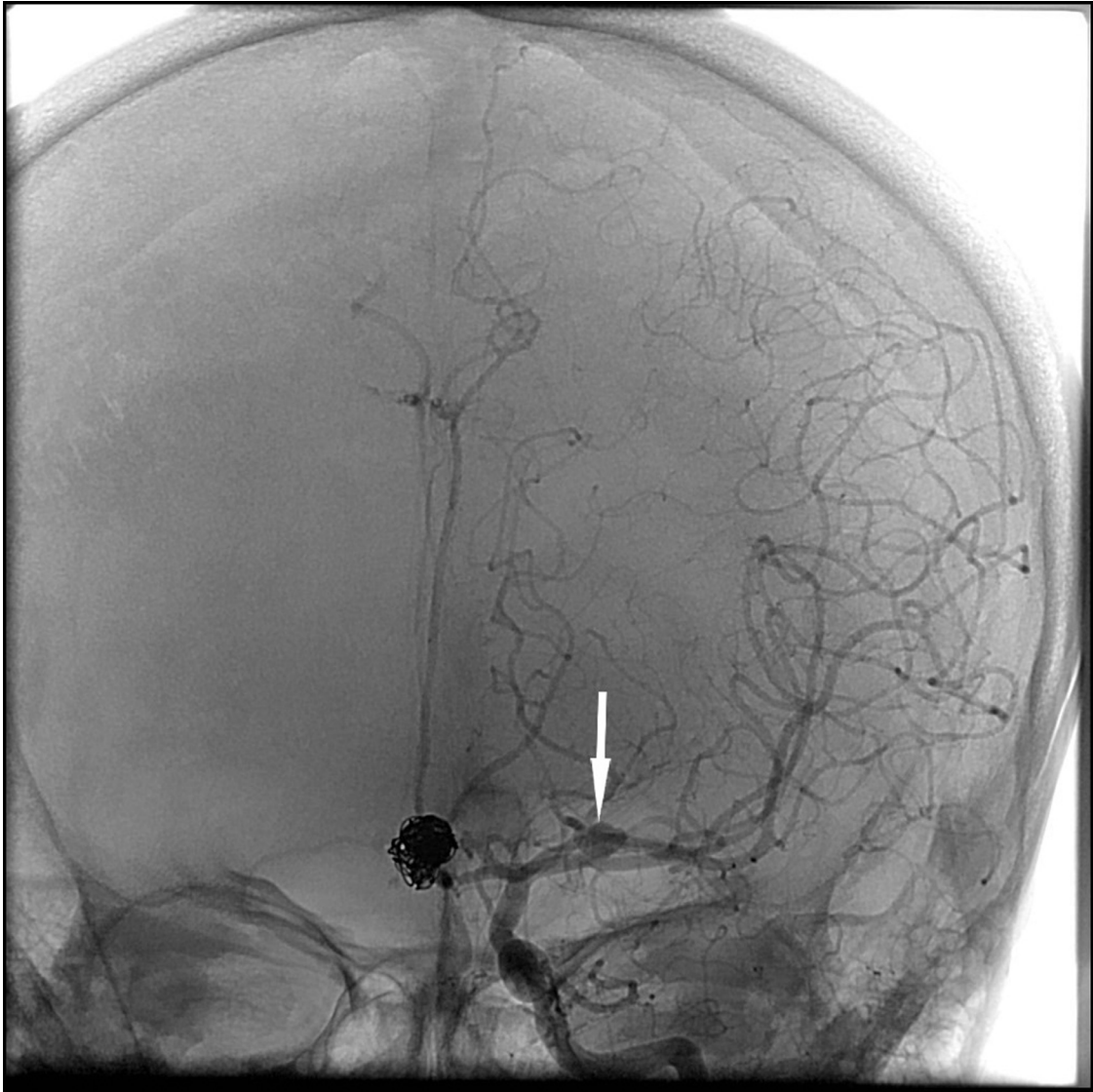


Fig. 4 – Coronal planar cerebral DSA following coiling. The arrow identifies an incidental left M1 middle cerebral artery aneurysm.

comes if they undergo timely and successful treatment of their aneurysm [3], as demonstrated by this case.

Supplementary materials

Supplementary material associated with this article can be found, in the online version, at [doi:10.1016/j.radcr.2018.04.003](https://doi.org/10.1016/j.radcr.2018.04.003).

REFERENCES

-
- [1] Wu TC, Tsui YK, Chen TY, Lin CJ, Wu TC, Tzeng WS. Rebleeding of aneurysmal subarachnoid haemorrhage in computed tomography angiography: risk factor, rebleeding pattern, and outcome analysis. *J Comput Assist Tomogr* 2012;36(Jan–Feb(1)):103–8.

-
- [2] Tang C, Zhang TS, Zhou LF. Risk factors for rebleeding of aneurysmal subarachnoid haemorrhage: a meta-analysis. *PLoS One* 2014;9(6):e99536. doi:10.1371/journal.pone.009953.
- [3] Tsuang FY, Su IC, Chen JY, Lee JE, Lai DM, Tu YK, Wang KC. Hyperacute cerebral aneurysm rupture rerupture during CT angiography. *J Neurosurg* 2012;116(6):1244–50.