DOI: 10.7860/JCDR/2024/73535.19762

Acute Subdural Haematoma due to Ruptured Posterior Communicating Artery Aneurysm: A Rare Presentation

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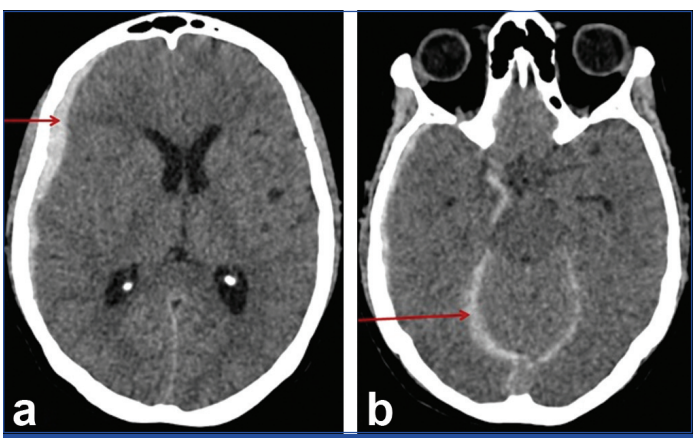
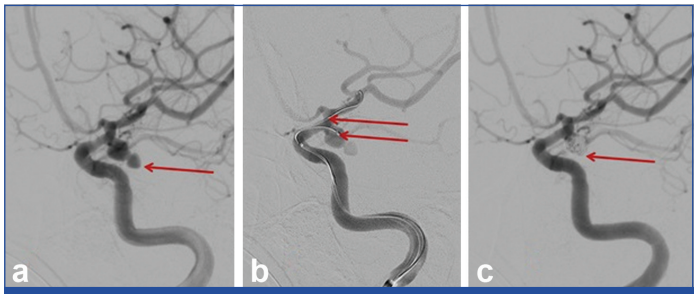
Keywords: Balloon-assisted coiling, Digital subtraction angiography, Ptosis

Acute Subdural Haemorrhage (SDH) frequently arises as a complication after head trauma, often resulting in sudden loss of consciousness and neurological impairments in an individual who was previously healthy [1]. Uncommonly, a ruptured aneurysm may present with SDH. Among these cases, a ruptured aneurysm at the junction of the Internal Carotid Artery (ICA) and the Posterior Communicating Artery (Pcom) stands out as the most common site associated with this uncommon spontaneous acute SDH [2]. This manuscript documents imaging and endovascular management of a rare case of a ruptured Pcom aneurysm presenting as acute SDH. The purpose of presenting this case was to underscore awareness of this condition, helping to prevent diagnostic and therapeutic errors [3].

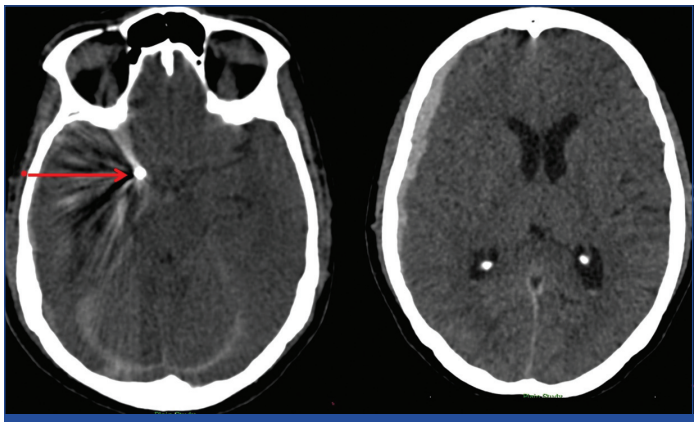
A 51-year-old woman came to the emergency department with a history of right eye ptosis, retro-orbital pain, and headache for 15 days. She had no other focal neurological deficits. A Computed Tomography (CT) scan of the brain [Table/Fig-1] revealed SDH along the tentorium and right cerebral convexity due to a ruptured right PCoM artery aneurysm. Blood investigations revealed normal parameters with haemoglobin level of 11.40 gm/dL, platelet count of 2.52 lac/mm^3, serum creatinine of 0.75 mg/dL, and normal coagulation parameters. She underwent urgent cerebral Digital Subtraction Angiography (DSA) on the same day. DSA revealed a large (approximately 17.0×9.5 mm size) postero inferiorly projecting wide-neck PCoM artery aneurysm on the right-side. The ruptured PCoM aneurysm was treated with balloon-assisted coiling [Table/Fig-2] on the next consecutive day. A postprocedure CT scan of the brain [Table/Fig-3] did not reveal any cerebral infarction or fresh intracranial bleed. The patient was electively ventilated for 24 hours in the Intensive care Unit (ICU) post-procedure . She was observed in the ICU for any evidence of cerebral vasospasm, electrolyte imbalance, hydrocephalous, or any neurological deficit. She received intravenous antibiotics, antiepileptics, analgesic medications, and intravenous fluids during her stay in the ICU and ward.



[Table/Fig-1]: a) CT brain revealed subdural haemorrhage along right cerebral convexity (red arrow); b) Along the tentorium (red arrow)



[Table/Fig-2]: a) Lateral DSA showing large postero-inferiorly projecting wide neck right PCoM artery aneurysm; b) Balloon-assisted coiling intraprocedure lateral DSA showing tip (lower red arrow) of coiling microcatheter inside the aneurysm and de-flated balloon (upper red arrow.) across the neck of aneurysm; c) Balloon-assisted coiling intraprocedure lateral DSA showing complete occlusion of the aneurysm with coils and patent ICA.



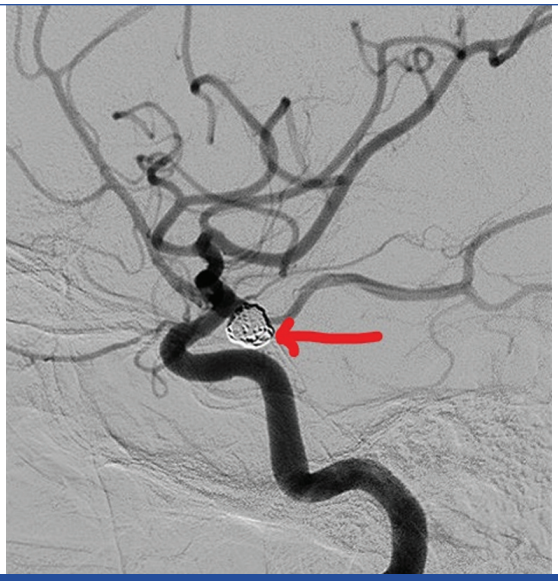
[Table/Fig-3]: Postprocedure CT brain shows coil mass (red arrow) with no evidence of cerebral infarction or fresh intracranial bleed.

Follow-up cerebral angiography [Table/Fig-4] after one week showed stable occlusion of the coiled PCoM aneurysm. She was discharged after 15 days without any fresh focal neurological deficits, reduced pain, and mild improvement in right eye ptosis. On discharge, she was advised to take oral analgesics and cerebral vasodilator medications. Follow-up after three months showed no fresh neurological complaints.

DISCUSSION

Acute SDH typically arises from the traumatic rupture of superficial cerebral veins, such as the bridging veins draining into the sinuses. Since its initial documentation by Munro in 1934, numerous cases of spontaneous SDH have been documented [4]. SDHs are frequently seen in elderly patients following brain trauma that disrupts the superficial bridging veins, typically situated along the cerebral convexity [5].

An uncommon cause of atraumatic SDH is a ruptured aneurysm. Rupture of intracranial aneurysms usually results in Subarachnoid Haemorrhage (SAH). The occurrence of SAH with SDH due to a ruptured intracranial aneurysm is rare, with prevalence ranging



[Table/Fig-4]: Follow-up cerebral angiography after one week in lateral view shows stable occlusion of coiled PCoM aneurysm (red arrow).

between approximately 0.5 to 10.3% of all aneurysmal SAH cases [6,7]. This phenomenon was considered to result from arachnoid membrane tearing caused by adhesion between the dura mater and arachnoid membrane, high blood pressure, or massive haemorrhage [8]. Haemorrhage spreads to the subdural space through this tearing. Although co-existent SDH is observed in more patients with aneurysmal SAH, isolated SDH due to a ruptured intracranial aneurysm has been rarely reported [6]. The ICA and Pcom junction are the most commonly reported sites for aneurysm location, followed by aneurysms in the middle cerebral artery and the distal anterior cerebral artery [9].

Al-Abdulwahhab AH et al., reported a case of a ruptured Pcom aneurysm that presented with tentorial and spinal isolated subdural haemorrhage [5]. They managed the case with open neurosurgical clipping of the aneurysm. In comparison to this, index patient did not had spinal subdural haemorrhage. Also, this case was managed by minimally invasive endovascular balloon-assisted coiling, which provided early recovery to the patient. Feng Z et al., reported a case of a SDH due to a fusiform aneurysm of the P2 segment posterior cerebral artery, which was managed with stent-assisted coiling and needed burr-hole neurosurgery for haematoma evacuation as the patient's clinical condition deteriorated after stent-assisted coiling [7]. In comparison to this, the present case was a ruptured saccular aneurysm of Pcom, which was a totally different location. The drawback of stent-assisted coiling when compared with balloon-assisted coiling is that the patient needs to be started on antiplatelet therapy for stent-assisted coiling, which might have resulted in an increase in the size of the SDH in their case after stent-assisted coiling. Aneurysmal SAH often manifests with non specific symptoms such as severe headache, vomiting, and sensitivity to light. While these symptoms are crucial for suspecting SAH, they do not provide precise aneurysm localisation [10].

Isolated aneurysmal SDH is a rare occurrence, which was present in index case and was successfully treated endovascularly.

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PLAGIARISM CHECKING METHODS: [Jain H et al.]

- Plagiarism X-checker: Jun 14, 2024
- Manual Googling: Jul 15, 2024
- iThenticate Software: Jul 15, 2024 (19%)

ETYMOLOGY: Author Origin

EMENDATIONS: 5

AUTHOR DECLARATION:

- Financial or Other Competing Interests: None
- Was informed consent obtained from the subjects involved in the study? Yes
- For any images presented appropriate consent has been obtained from the subjects. Yes

Date of Submission: **Jun 13, 2024**
Date of Peer Review: **Jul 12, 2024**
Date of Acceptance: **Jul 16, 2024**
Date of Publishing: **Aug 01, 2024**