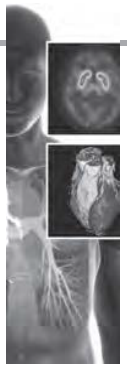

Aneurysmal Subarachnoid Hemorrhage Management Associated with Unsuspected Aortic Coarctation

Subarachnoid hemorrhage caused by rupture of an intracerebral aneurysm is commonly seen in isolation. We report a rare case wherein it was associated with coarctation of aorta that increases the risk of aneurysmal rupture.

KEYWORDS: Subarachnoid hemorrhage • Aortic coarctation • CT angiography

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Case Presentation

We report the case of a 47 years old male who presented to our emergency department with sudden onset severe headache. CT head revealed aneurysmal SAH and CT angiography revealed left Middle cerebral artery aneurysm. Interventional cerebral angiography raised the suspicion of Aortic aneurysm. CT Aortography confirmed a juxtaductal occlusion of the aorta with collaterals via the subclavian arteries. Echo showed left ventricular hypertrophy with bicuspid aortic valve. Aneurysm was clipped surgically. Patient had a poor neurological outcome with development of cerebral vasospasm and was subsequently treated with intra-arterial and IV milrinone. Patient was tracheostomized and discharged after three weeks.

Conclusion

Intracerebral aneurysm associated with coarctation of aorta is a rare occurrence and is associated with increased risk of aneurysmal rupture and SAH.

■ Background

Subarachnoid hemorrhage (SAH) is a common neurological event, often caused by rupture of an intracerebral aneurysm (IA). Although cerebral aneurysm is seen in isolation, a rare association with aortic coarctation has been reported. Aortic Coarctation (AC) rarely goes undiagnosed until adulthood. The incidence of cerebral aneurysm is higher in patients with coarctation than the general population, whereas incidence of AC in patients with IA is as low as 0.45%. The risk of aneurysmal rupture is increased in this patient population.

■ Case report

A 47-year-old male presented with sudden onset severe headache, with no associated loss of consciousness or seizure (Hunt-Hess II). CT head revealed an aneurysmal SAH (modified Fisher 3) and CT angiography showed a left MCA aneurysm (3.4 × 4.1 mm). He was a known hypertensive, non-compliant with treatment [1]. The patient was scheduled for an interventional cerebral angiography the next day. The inability to maneuver the angio catheter introduced via the femoral artery across the thoracic aorta along with an observed arterial pressure gradient between the upper and lower limbs raised the suspicion of AC. Based on that suspicion, a CT aortography was performed which confirmed a juxta-ductal occlusion of the aorta with rich collateral circulation via the subclavian arteries [2]. A bedside echocardiogram revealed a concentric LVH with a bicuspid aortic valve. Surgery was planned for the next morning and the aneurysm was clipped uneventfully. Post-incidence day 3, the patient developed right hemiparesis secondary to left parietal infarction and brain edema necessitating left decompressive craniectomy. On the 6th post-incident day, the patient developed worsening in his level of consciousness with a new left hemiparesis. Cerebral angiography via the radial artery revealed severe vasospasm which was treated with intra-arterial milrinone injection of 2 mg in (L) ICA and 1mg in (L) MCA followed by i.v milrinone infusion with therapeutically augmented BP using vasopressor infusions [3]. Careful monitoring of the BP in preductal and postductal arterial distribution was done using invasive arterial lines in the upper as well as lower limbs with an aim to avoid vascular sequelae from altered cerebrovascular physiology [4]. Minimal neurological improvement was observed over the next two weeks. He was tracheostomized and discharged to the ward on the 20th post-incident day. Modified Rankin scale at 9 months was 5. Patient could not be taken up for surgical

correction due to poor neurosurgical outcome.

Discussion

Coarctation can occur anywhere along the course of aorta, however, it is most common distal to the origin of the left subclavian artery. Absent or weak lower extremity pulse, discrepancy between blood pressure reading in the arms and legs, arterial hypertension in the upper limbs, a heart murmur and enlarged collateral vessels that can be palpated in the chest wall should raise the suspicion [5]. Unfortunately, the diagnosis of AC is often made after a serious complication has occurred, such as congestive heart failure, bacterial endocarditis, aortic rupture or a cerebrovascular disease. Association of CA with SAH has been reported in literature with an incidence of 0.45% (0.9-1.9%) 1, 2, 3. Wiseman5 reported SAH in a patient with coarctation in the absence of any cerebrovascular anomaly. Although the incidence of aneurysm does not significantly vary in the population with or without having CA, the risk of aneurysmal rupture is higher in CA patients and the average age of SAH is younger in patients with a CA increasing the risks and complications and thus demanding an early diagnosis and treatment. 3, 4 Intensive care management of these patients can be challenging as the cerebral auto regulation is disturbed and any excessive increase in the arterial pressure directly translates into raised ICP and may adversely affect the heart. On the other hand, normotensive treatment strategies can worsen any existing cerebral vasospasm management and cause renal hypo perfusion.

Conclusion

this paper aims at increasing the awareness of the association between undiagnosed AC and aSAH and the need to do a detailed systemic evaluation of SAH patients. Furthermore, it describes the challenging neurointensive care management of severe cerebral vasospasm in an uncorrected AC patient.

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■ Ethics approval and consent to participate

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Competing Interests

The authors declare that they have no competing interests.

Author's Contribution

S.A beigh is the main author who was involved in the care of the patient and compiled this report. Y Abulhasan is the most expert physician and experienced author involved in the management of this patient and provided his expert advice and analyzed the report before submission. Bosnjakovic P was the interventional radiologist involved in the patient care.

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