Anterior communicating artery aneurysm case reports

2021


An 81-year-old man was referred to the department of neurosurgery for a large A-com AN artery aneurysm, which was detected incidentally. The patient hoped not to be treated but to be followed up. After 4 months, magnetic resonance imaging (MRI) revealed the presence of a cerebral edema and hematoma around the aneurysm, and partial thrombus in the upper wall of the aneurysm was suspected. Based on these findings, the patient underwent an immediate coil embolization a day after admission. However, the portion of the aneurysm neck remnant increased in size after the first procedure. Therefore, 8 months after the initial procedure, he was treated with stent coil embolization. Contrary to the first procedure, angiographic evaluation revealed an active pulsating aneurysm. Moreover, MRI revealed the presence of a partial thrombus in the upper neck segment of the aneurysm, with an intensity that changed over time. The patient underwent cautious treatment and was discharged without any symptoms. This is the first case study to reveal an A-com AN with active pulsation and the relationship between the pulsatile portion of the aneurysm and thrombosed portion by MRI.

2020


A 68-year-old male who underwent right-sided pterional craniotomy for clipping of an unruptured, anterior communicating artery aneurysm and experienced contralateral vasospasm five days later. Knight et al. further discussed the pathophysiology underlying vasospasm after uncomplicated craniotomy and non-hemorrhagic aneurysm clipping.

2019

Al Saiegh et al. presented the first case of a 53-year-old female whose work-up for headaches showed an anterior communicating artery aneurysm. The patient underwent distal transradial cerebral angiography and subsequent placement of a Woven EndoBridge (WEB) device for treatment of the aneurysm through the same access site. The procedure was uneventful and the patient was discharged home neurologically intact. Her hand remained warm, well-perfused, and with no visible or palpable hematoma. Our report illustrates the feasibility of the distal TRA for the treatment of cerebral aneurysms using the WEB device. Further studies are necessary to confirm the additional
benefits of the distal TRA over TRA for neurovascular access 3).

Hironaka et al. presented a 39-year-old male with gradual-onset headache whose initial diagnosis was cerebral aneurysm and communicating hydrocephalus. The correct diagnosis was primary intradural extramedullary malignant melanoma of the spinal cord. Initial brain magnetic resonance imaging demonstrated slight dilation of cerebral ventricles and a 3-mm unruptured anterior communicating artery aneurysm. He was placed under observation therapy. Two months later he was seen again due to severe headache. There was no intracranial hemorrhage on brain computed tomography scans. As we suspected rupture of the aneurysm, we operated on him for surgical clipping; however, there was no aneurysmal rupture. We found no lesions responsible for hydrocephalus, so we placed a ventriculoperitoneal shunt. His headache subsequently resolved. Nine months later he developed gait disturbance; a large volume of ascites was observed. Gadolinium-enhanced lumbar magnetic resonance imaging revealed an intradural extramedullary mass at the L-1 to S-5 level. Cytology and immunohistochemistry of the cerebrospinal fluid and ascites identified a few atypical cells positive for HMB-45, S-100 protein, and Melan-A. Whole-body examinations detected no primary lesions outside the central nervous system. The final diagnosis was primary intradural extramedullary malignant melanoma of the spinal cord with cerebrospinal fluid dissemination 4).

A 29-year-old male presenting with bilateral lower extremity weakness in addition to rigidity. The patient is known to have bipolar disorder and an Anterior communicating artery aneurysm (ACoA) for which he has not followed up. A CTA showed a partially thrombosed 5 mm × 6 mm ACoA aneurysm. The patient underwent placement of flow diverter PED.

Central causes of acute bilateral foot drop are rare but should be considered in the differential diagnosis. Thrombo-embolism due to a partially thrombosed aneurysm is a well-known phenomenon, all treatment options should be considered keeping in mind the risks associated with the different techniques due to the intra saccular thrombus 5).

Malignant intracranial hypertension (IHT) intracranial tension (ICT) is a surgical emergency. Routine decompressive craniectomy may not be sufficient in reducing the malignant IHT. At present, we do not have the exact solution to this ominous situation. Authors came across a similar scenario where we had to go forward with modification of a previously known described procedure, removing bifrontal, temporal, and parietal bones including midline bone strip over a superior sagittal sinus in a case of resistant malignant ICT, following coiling of an anterior communicating artery aneurysm. This radical technique, named as megacraniectomy, was used as a last resort in a rapidly deteriorating patient. The patient survived the stormy phase of malignant ICT and showed significant improvement in neurological status. Authors here describe this approach as a novel idea to be explored in resource-stricken situations 6).

Anatomic variations of the anterior cerebral artery-anterior communicating artery complex (ACA-AComA) are common. An infra-optic course of the A1-ACA is extremely rare, and recognition of this variant is very important in planning surgery for ACA-AComA complex aneurysms. We present two
cases of spontaneous subarachnoid hemorrhage due to ruptured AComA aneurysms with unilateral infra-optic course of the A1-ACA. In both the cases, the preoperative catheter angiography revealed low bifurcation with a horizontal course of internal carotid artery. In our first case, the finding was rather unexpected; however, in our second case, we could anticipate an infra-optic course of A1-ACA. Preoperative recognition of this anomaly helps in achieving proximal vascular control with ease and confidence. It also enhances surgical safety of aneurysm clipping, by avoiding unnecessary dissection elsewhere. This emphasizes the importance of careful preoperative angiographic evaluation. In the presence of this anomaly, one should always search for other associated vascular anomalies.

Prolonged anterograde amnesia and disorientation after anterior communicating artery aneurysm coil embolization.

Johnson et al. presented a case of a 14-year-old female who presented 2 years prior with an intraparenchymal hemorrhage secondary to a left parietal arteriovenous malformation. That AVM was successfully microsurgically resected and revealed complete angiographic obliteration on postoperative and surveillance angiograms. This patient now presents with a spontaneous intraventricular hemorrhage secondary to a ruptured anterior communicating artery complex aneurysm with a fistulous connection from this aneurysm to the inferior petrosal sinus. The aneurysm and direct AVF were not identified on prior surveillance imaging, indicating de novo formation in a remote site from her prior AVM.

This case highlights the importance of long-term imaging surveillance in patients with AVMs. Further prospective studies are indicated to evaluate the long-term imaging surveillance necessary to detect early recurrence, thereby allowing doctors to institute earlier definitive treatment. The exact pathophysiology behind these lesions is not fully understood; however, this case lends support to an acquired etiology to vascular malformations.

A video demonstrates a “reverse picket fence” clipping technique of an incidental, large anterior communicating artery (ACoA) aneurysm in a 52-yr-old woman. Bilaterally adherent A2-anterior cerebral artery (ACA) segments led to abortion of a prior clipping attempt at an outside hospital. After obtaining patient consent, a modified orbitozygomatic craniotomy was performed with gyrus rectus removal. Temporary clips were applied to A1-ACA for freeing the adherent A2-ACA segments from the dome. The aneurysm was clipped using a “reverse picket fence” technique transmitting the A1-A2-A2 bifurcation through the fenestration tube. Bilateral recurrent artery of Heubner was preserved. Indocyanine angiography demonstrated parent vessel patency with complete aneurysm exclusion. Postoperatively, the patient experienced short-term memory loss, which resolved over 6 mo with cognitive rehabilitation. The “reverse picket fence” technique can be considered for large aneurysms directed away from the surgeon, obviating the need for difficult dissection of adherent efferent arteries from aneurysmal sac. Adjusting the heel position of each fenestrated clip in this construct allows the patency of hidden perforators behind the aneurysm to be maintained. Video © Barrow Neurological Institute. Used with permission.

A giant unruptured anterior communicating artery aneurysm presenting with seizures.

Operative Neurosurgery - https://operativeneurosurgery.com/
A 20-year-old Sri Lankan female presented with headache, altered personality, disinhibited behavior, and urinary incontinence. On imaging, she was found to have infarctions of both frontal lobes and evidence of a ruptured anterior communicating artery aneurysm with a small subarachnoid hemorrhage. Another small middle cerebral artery aneurysm was also seen in the angiogram. She was managed conservatively and gradually recovered. Because aneurysms in neurofibromatosis are usually asymptomatic and as rupture of such an aneurysm is rare, regular vascular screening is not recommended to all patients with neurofibromatosis. This is the first case report in literature in which a patient with neurofibromatosis presented with infarctions of both frontal lobes due to the rupture of an anterior communicating artery aneurysm.

A case of a 14-year-old female who presented two years prior with an intraparenchymal hemorrhage secondary to a left parietal arteriovenous malformation. That AVM was successfully microsurgically resected and revealed complete angiographic obliteration on postoperative and surveillance angiograms. This patient now presents with a spontaneous intraventricular hemorrhage secondary to a ruptured anterior communicating artery complex aneurysm with a fistulous connection from this aneurysm to the inferior petrosal sinus. The aneurysm and direct arteriovenous fistula were not identified on prior surveillance imaging, indicating de novo formation in a remote site from her prior AVM.

This case highlights the importance of long term imaging surveillance in patients with AVMs. Further prospective studies are indicated to evaluate the long term imaging surveillance necessary to detect early recurrence; thereby, allowing institute earlier definitive treatment. The exact pathophysiology behind these lesions is not fully understood; however, this case lends support to an acquired etiology to vascular malformations.


Transient loss of consciousness (TLOC) is a common presentation to the emergency department and has a multitude of causes from benign to potentially fatal. We describe the case of a young female presenting with TLOC during sexual activity that was subsequently diagnosed with subarachnoid haemorrhage. She had normal neurology and only moderate headache. She was subsequently transferred to a neurosurgical unit and underwent endovascular coiling of a small anterior communicating artery aneurysm. She was discharged 15 days later without sequelae.

Das et al. described the case of a 60-year-old nondiabetic lady who presented with Acom aneurysmal
subarachnoid hemorrhage having a World Federation of Neurosurgical Societies (WFNS) grade I. She underwent an uneventful right pterional craniotomy and clipping of the aneurysm, except for a short period of controlled rupture of the aneurysm. Postoperatively she developed complete ONP on the right side, though her sensorium was preserved. Computed Tomogram and Magnetic Resonance Imaging scans of the brain did not yield any useful information regarding its etiology. She was conservatively managed and kept on regular follow-up. She had a gradual recovery of ONP in the following order: pupillary reaction, ocular movements, and finally ptosis. On postoperative day 61, she had a complete recovery from ONP.

It is a very unusual case of complete ONP following Acom aneurysm clipping and its management by masterly inactivity.

Vakharia et al. presented a patient requiring a stent-assisted coiling of an anterior communicating artery aneurysm in whom a stent anchor technique was used to reduce a microcatheter loop within an aneurysm dome before coil embolization. Postembolization angiographic runs showed complete coil occlusion of the aneurysm with approximately 35% packing density. The video can be found here: https://youtu.be/zHR1ZOArUro.

2018

A 61-year-old male presents with diplopia of acute onset and progressive course. He has a history of previous intracranial haemorrhage that was surgically evacuated 7 years ago and was also associated with diplopia. Examination revealed left complete oculomotor nerve paralysis with a fixed and dilated left pupil. Computed tomography (CT) revealed encephalomalacia, evidence of previous craniotomy, and an incidental left parietal convexity meningioma. CT angiography of the brain revealed a left tortuous duplicate middle cerebral artery with fenestration of its proximal part, an anterior communicating artery aneurysm, and a characteristic capillary blush of the meningioma. Possible mechanisms of oculomotor nerve involvement are discussed.

2016

Cohen et al., describe a technique for T-configured stent-assisted coiling in the management of ruptured wide-necked AcomA aneurysms by means of two simultaneous microsystems that allowed placement of two nitinol self-expandable Leo+ Baby stents (Balt Therapeutics, Montmorency, France) followed by coiling. Technical details and comparison to other dual stent configurations were presented and briefly discussed.

A 69-year-old male without a past history of mental disorders and neurological symptoms presented with a 2-month history of anxiety, sadness, lack of pleasure in usual activities, fatigue, difficulties falling asleep and waking up early in the morning, reduced appetite, and weight loss. The patient was diagnosed with major depressive disorder and antidepressant treatment was initiated. Subsequent non-contrast computed tomography (CT) of the head demonstrated hypointense oval-shaped lesion within the projection of the anterior communicating artery. CT angiography confirmed the diagnosis of a 0.8 × 0.6 cm saccular aneurysm originating from the anterior communicating artery and anterior cerebral artery. The patient underwent microsurgical clipping of the aneurysm. On psychiatric assessment 1 month after the surgery, there were no signs of depressive disorder and antidepressive treatment was discontinued. On follow-up visit 1 year after the surgery, the patient did not have any
mood symptoms.

The case indicates that organic brain lesions, including intracranial aneurysms, should be suspected in elderly patients presenting with their first episode of mental disorder \(^{20}\).

**2015**

Seung et al., present an unusual case of bitemporal hemianopsia caused by a large intracranial aneurysm of the ACoA. A 41-year-old woman was admitted to our neurosurgical department with a sudden-onset bursting headache and visual impairment. On admission, her vision was decreased to finger counting at 30 cm in the left eye and 50 cm in the right eye, and a severe bitemporal hemianopsia was demonstrated on visual field testing. A brain computed tomography scan revealed a subarachnoid hemorrhage at the basal cistern, and conventional cerebral catheter angiography of the left internal carotid artery demonstrated an 18×8 mm dumbbell-shaped aneurysm at the ACoA. Microscopic aneurysmal clipping was performed. An ACoA aneurysm can produce visual field defects by compressing the optic chiasm or nerves. We emphasize that it is important to diagnose an aneurysm through cerebrovascular study to prevent confusing it with pituitary apoplexy \(^{21}\).

A 55-year-old man presented with a 3-year history of visual impairment associated with personality changes. His sister had died after an intracerebral aneurysmal rupture. An examination revealed poor visual acuity in the right eye with a field defect, as well as impaired neurocognition. Computed tomographic (CT) angiography (Panel A) and magnetic resonance imaging of the brain revealed a partially thrombosed, calcified, 7-cm aneurysm of the anterior communicating artery, with surrounding edema (Panel B). Thrombectomy and aneurysmal repair were performed to reduce the risk of aneurysmal rupture and to alleviate the mass effect. The patient recovered from surgery and had improvement in his neurocognitive deficits and vision, and he was able to return to work. His condition remained stable 2 years later, and delayed CT showed collapse of the aneurysmal sac (Panel C). Giant aneurysms (>2.5 cm) represent a small proportion of brain aneurysms but are associated with a high rupture rate when left untreated. Approximately 20% of patients with a brain aneurysm have a first-degree relative with a brain aneurysm \(^{22}\).

**1988**

A study reports the case of a 42-year-old man who suffered a ruptured aneurysm of the anterior communicating artery. His memory capabilities were assessed after a considerable recovery period during which many of his memory deficits ameliorated. His scan revealed a left frontal lesion and many of his deficits were characteristic of frontal impairment. He was impaired on temporal discrimination, and he showed marked source forgetting. He also performed badly on the Brown-Peterson task, and we suggest that this is another task that may be characteristic of frontal impairment. In contrast, the patient showed normal or near normal performance on some memory tasks but not on others. It is concluded that the patient's frontal signs are similar to those found in Korsakoff's Syndrome, but that his memory impairment is qualitatively different from that encountered in patients with the amnesic syndrome \(^{23}\).

**1979**

A patient with an anterior communicating artery aneurysm successfully treated surgically by
occluding its major feeding vessel, the left anterior cerebral artery, displayed a homolateral hemiparesis. The possibility of ipsilateral innervation is strongly suggested based on clinical grounds and the post operative follow-up angiographic studies, EEG and PEG \(^{(24)}\).

An anterior communicating artery aneurysm simulating a 3rd ventricular tumor with obstructive hydrocephalus demonstrated on CT scan. Angiography showed the “tumor” to be an aneurysm. They believed that giant aneurysms of the anterior communicating artery should be included in the differential diagnosis of suspected 3rd ventricular tumors along with suprasellar masses as seen on CT scans \(^{(25)}\).

1978

Waga et al. reported the successful surgical treatment of a patient with an anterior communicating artery aneurysm associated with the absence of all of the left cervical carotid arteries. A review of the previous reports of 15 cases of intracranial aneurysm in association with the absence of the internal carotid artery emphasizes the rarity of this lesion. Aneurysms with such an association have a distinct distribution different from that observed in the usual population. The data suggest that intracranial aneurysm develops more frequently in the absence of the internal carotid artery as a result of altered hemodynamics \(^{(26)}\).

McFadzean and Gowan reported two cases of optochiasmal arachnoiditis which followed subarachnoid haemorrhage. In one case the visual deterioration was arrested and improved by the administration of systemic steroids \(^{(27)}\).

A non operated aneurysm of the anterior communicating artery enlarged considerably over a seven years period; it finally thrombosed and behaved like a suprasellar tumor. The clinical course, the angiographic evolution and the anatomical examination allowed, in this case, to account for the increase in volume by progressive stretching of the wall, and not by incorporation of a false aneurysmal sack resulting from an encapsulated haematoma. Histologically, the wall of this giant aneurysm showed various changes: on the inner aspect, progressive thickening occurs, due to fibrous organization of mural thrombosis; in the depth, far from the nutrient sources, necrotic atheromatous like foci occur, which isolate an inner leaflet, prone to become necrotic at a later stage. Distension of such a weakened wall may lead to several consequences; a progressive increase in the volume of the aneurysm, partial ruptures with haemodissection starting from the aneurysmal lumen, or even complete rupture of the wall and subarachnoid hemorrhage. On the other hand, circulatory stasis, due to the important increase in volume, may facilitate progressive thrombosis of the aneurysm. The living character of the wall is emphasized by the coexistence of these unfavorable (degeneration, ruptures) and favorable (thrombosis, fibrous organization) features, which continuously influence the spontaneous evolution of the aneurysm \(^{(28)}\).

1977

A 48 year-old male has been suffering from the left paralysis and mental disorder after the initial attack of subarachnoid hemorrhage, and the second attack resulted in the deterioration of the
symptoms. He was admitted to our clinic on October 28, 1974. On neurological examination, mental disorders, such as disorientation, emotional incontinence, amnesia and acalculia, hemiplegia on the left and meningeal irritation signs were observed in admission period. Physical examination was negative. Cerebral angiographic findings were as follows: 1) Moderate vasospasm of the right internal carotid artery at the terminal segment, mild bowing of the anterior cerebral artery and stretching of the frontoparietal opercular branches of the middle cerebral artery were observed. 2) Right frontopolar arteriovenous malformation fed by the frontobasal artery and the frontopolar artery, and drained via the aberrant cortical vein into the superior sagittal sinus. 3) Aneurysm of the anterior communicating artery was opacified by left carotid angiography. 4) An abnormal vessel derived from the terminal segment of the right internal carotid artery and terminated at the portion of the sphenoidal segment of the middle cerebral artery. Complete loop was formed between genuine middle cerebral artery and this abnormal artery. He was operated with dissecting microscope on November 11, 1974. The arteriovenous malformation at right frontopolar region was totally removed and aneurysm of the anterior communicating artery was clipped. According to the operative findings, the arachnoid membrane over the right frontopolar region was turbid and adhered to the adjacent tissues. On the contrary, no abnormal findings suggestive of previous subarachnoid hemorrhage were observed around the region of the anterior communicating artery aneurysm. These findings showed that subarachnoidal bleeding was caused by rupture of the arteriovenous malformation of right frontopolar region, but not by the aneurysm on the anterior communicating artery. The postoperative course was uneventful and during the hospitalization the patient starts on rehabilitation therapy. The authors discussed the genesis of fenestration of the middle cerebral artery and relation among these combined vascular anomalies. We inferred that fenestration of the middle cerebral artery arose from the in complete fusion of procursor vascular network in embryonic stage. Additionally, we emphasized that it was necessary to make a distinction between these two terms “fenestration” and “duplication”.

1976

The technique of preferential cerebral hypothermia is reported in its application to a patient with a “giant” anterior communicating artery aneurysm. The method utilizes elective ventricular fibrillation and differential or “preferential” hypothermia induced by a combination of external skin cooling and perfusion of core organs with 0 degree buffered electrolyte solution. The value of the technique lies in its provision of a period of safe circulatory arrest approaching one hour without the need for anticoagulation, heart-lung bypass, open chest resuscitation or major vessel clamping. Because of the absence of blood flow and because of the clear fluid washout of the cerebral vessels, it was possible to open the aneurysm, evacuate its contents and resect it in several sections. It was not necessary to clip the feeding arteries until all dissection and total removal of the aneurysm were completed. The application of the technique to neurosurgery and cardiovascular surgery is discussed.

1975

A case of giant aneurysm arising from the anterior communicating artery, 24 X 28 X 30 mm in diameter was found in a 30 year old man. About ten years ago he became blind and recently developed right anosmia and diencephalic seizures. No subarachnoid hemorrhage, however, was found. Radiograms and tomograms of the cranium showed a ring-like calcification, but by angiography it couldn't be recognized as a giant aneurysm. The right frontal craniotomy and partial resection, therefore, was performed. A histological study of the resected material revealed that it was a spontaneously thrombosed giant aneurysm. The inner layer of its wall had neither endothelium nor elastic lamina, but had deposits of calcium salt. The outer layer was composed of collagen fibers.
without cell infiltration. The aneurysm was thrombosed except for its neck but its organization occurred incompletely. We want to emphasize the importance of a correct preoperative diagnosis, as an erroneous operative procedure can result in disaster. Volume, viscosity and tension of flowing blood into the aneurysm as well as the size of its neck and dome regulate dynamic properties. These properties may determine the enlargement rate or growth of the aneurysm. The dynamic characteristics and features of the inner surface of the aneurysmal wall may regulate the formation of thrombosis in the aneurysm. The intraluminal thrombosis and strength of aneurysmal wall, for example, calcium deposits, may prohibit aneurysm from its rupture.

1974

Delayed appearance of anterior cerebral arteries on isotopic cerebral flow study: a sign of bleeding anterior communicating artery aneurysm.

Anterior communicating artery aneurysm not visualized by angiography. Report of two successfully operated cases.

References


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