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Acute reversible paraparesis secondary to cerebral aneurysm: An unusual presentation

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Abstract
The etiology of acute paraparesis/paraplegia is multiple, and they include spinal cord diseases, peripheral nerve conditions, and from intracerebral origin. In these latter cases, there are some reports that are secondary to aneurysm of the anterior cerebral artery, and clinically of acute non-ictal type. We report a patient with an aneurism in the anterior communicating artery, but of ictal-onset type, reversible within minutes, with findings of an asymptomatic left medial frontal parenchymal ischemic injury. At our opinion, this patient did have transient ischemic attack-like clinical manifestations, probably due to collateral circulation.

Keywords: Paraparesis, paraplegia, cerebral aneurysm, anterior cerebral artery

Introduction
Paraparesis (PPP) and paraplegia are often used as synonyms; however, PPP refers to weakness that affects both lower extremities, and paraplegia is paralysis of both lower extremities [1]. Although it has diverse etiologies, most cases of PPP derive from: Spinal cord injuries [1, 2], secondary to peripheral nervous system diseases, from demyelinating central nervous system conditions as multiple sclerosis, vascular pathology (ischemic or hemorrhagic) of the spinal cord, local or systemic infectious diseases, and neoplastic and non-neoplastic compression disease of spinal cord [1, 2, 3].
On the other hand, among causes of acute monoparesis of the lower extremities, stroke in the territory of the anterior cerebral artery (ACA) is a classic etiology, usually contralateral to the site of the lesion (approximately 90% in this type of patients) [4, 5]. In these cases, most patients have other symptoms and clinical findings like homolateral ataxia, bradykinesia, global akinesia, parkinsonian gait, tremor, dystonia, dysarthria, abulia, psychomotor agitation, motor perseveration, emotional lability and incontinence, and memory deficits [4].
There are some case reports of PPP, associated to some of the symptoms previously described, as secondary to aplasia of the A1 segment of the ACA [6].
In the group of vascular diseases, ACA aneurysms are also described as causing PPP, especially secondary to rupture of the aneurysm, or as consequence of subarachnoid hemorrhage [7, 8].
We present a patient with an acute and totally reversible PPP secondary to an unruptured aneurysm of the ACA, not previously reported in available literature according to our review.

Case Report
This is a 36-year-old male patient without previous morbid diseases. He came to the emergency room (ER) with a history of sudden paresthesia and paresis of both lower extremities of about 5 minutes long. It was followed by a holocranial headache of an 8/10 intensity. He denies any other symptoms. At ER, the patient was normotensive, normocardiac, afebrile, and had a normal neurological examination. A computed tomography angiography (a-CT) of the brain was performed and shows an image of an intraventricular saccular aneurysm of 18mm in major axis at the left lateral ventricle, originating from the A1-A2 junction of the left ACA (Fig.1).

A conventional therapeutic angiography was performed and reported a partially thrombosed dissecting aneurysm of segment A2 of the left ACA, with a filling of the ACA vascular territory by distal branches of the left middle cerebral artery (MCA) and by a retrograde flow from pericallosal artery branches. A satisfactory aneurismal exclusion was achieved with coils, without evidence of vasospasm (Fig.2). The patient ended up asymptomatic and was discharged home.

Discussion

For clinical purposes, it's useful to separate PPP into those with acute onset (a-PPP) from those with chronic onset (c-PPP) (1). The a-PPP are usually of spinal traumatic origin (1,2), but there are also non-traumatic origins like those of vascular etiologies, spinal-cord inflammatory disease, spinal infectious or para-infectious complications, acquired demyelinating, and secondary to peripheral nervous system pathology [9] like acute polyneuropathy. All of these conditions are mostly irreversible or disabling at short and long term.

Infarction of the anterior spinal artery (ASA) is one of most common causes of PPP (3,5), and like cerebrovascular disease, many cases of acute reversible PPP had been described. These cases meet criteria for transient cerebral ischemia (TIA), and include total reversibility and negative parenchymal neuroimaging, but are very infrequent: about 3% to 7% of cases in some clinical series [10, 11, 12]. Our patient appeared to have a TIA, but his symptoms were secondary to a cerebral aneurysm, and not due to an ASA infarction. According to our review of the available literature, a case like this hasn't been previously described.

Among vascular pathology, ACA aneurysms are mentioned in some series as a possible etiology of PPP (4,5), but it presents non-ictal, and it's described as two possible syndromes: the so called "Aneurysm Paraparesis Syndrome of the ACA", described as the installation of motor deficit on both lower extremities within the first 7 to 40 days, associated with vasospasm in the ACA territory (13); and a novel syndrome not associated to vasospasm, but with hydrocephalus and PPP onset in the first 2 hours of the installation of symptoms. These latter cases PPP partially recovers in the first week, and it's possibly explained by the parenchymal injury occurring at the supplementary motor area and not at the primary motor area [7, 14]. Our patient is radiologically like this last group of reported cases, but the PPP was totally reversible in minutes, and without hydrocephalus.

In this case report, the clinical manifestations could be explained by collateral circulation from distal branches of left MCA, and the retrograde flow of pericallosal artery branches.

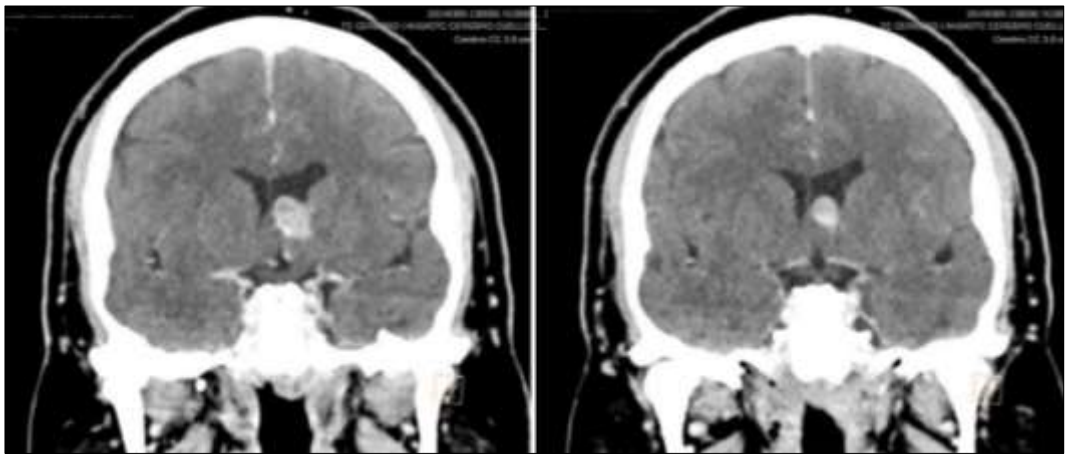

Fig 1: Intraventricular saccular aneurysm of 18mm in major axis at the left lateral ventricle, originating from the A1-A2 junction of the left ACA

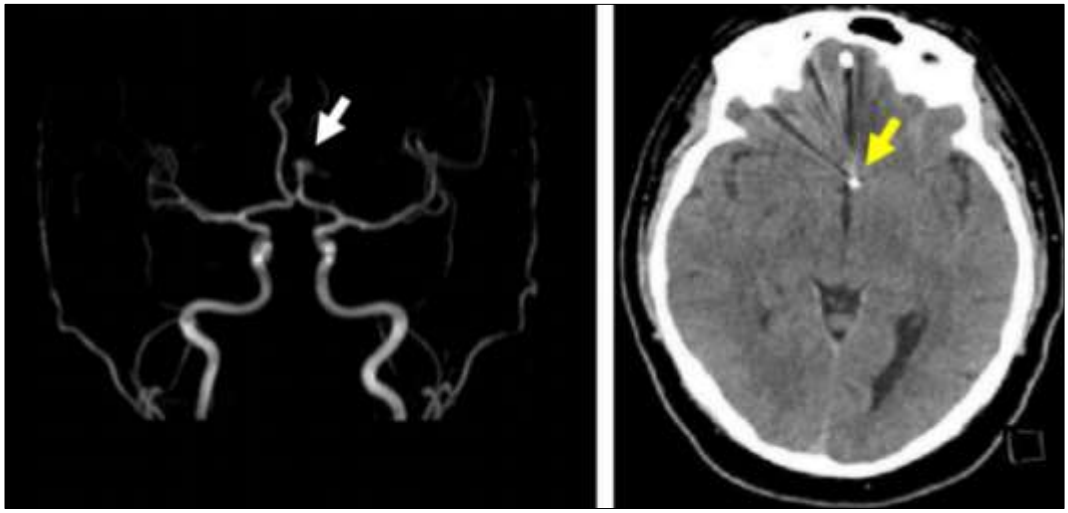

Fig 2: Aneurismal exclusion (Marked with the white arrow) was achieved with coils (Marked with the yellow arrow), without evidence of vasospasm.

Conclusion

Neurosciences, and specially neurology, are characterized by a rich semiology in the neurological diagnosis [15]. When a patient presents with a PPP, the topographic diagnosis is usually in the spinal cord, and it's rarely secondary to an intracranial origin; even so, ACA aneurysms had been described as a cause of PPP, either associated to vasospasm, or with hydrocephalus, but without vasospasm. In both cases, the PPP is non-ictal, and partially reversible; but, as it has been reported in this case, it can also be ictal, and totally reversible.

Acknowledgments

To our patients, who teach us every day to be better as human beings. To our families, whose support is essential to fulfill our dreams.

Competing Interest

The authors declare no competing interest.

Author´s Contribution

All the authors contributed to this work.

References

1. Cubo E, Masdeu JC. Paraparesis and Paraplegia. In: Aminoff MJ, Daroff RB, editors. Encyclopedia of the Neurological Sciences. 2nd ed. Oxford: Academic Press; c2014. p. 790-1.
2. Wijdicks EFM, Kramer AH, editors. Handbook of Clinical Neurology, Vol. 140 (3rd series) Critical Care Neurology, Part I [Internet]. Amsterdam: Elsevier; 2017 [cited 2024 Aug 18]. Available from: http://dx.doi.org/10.1016/B978-0-444-63600-3.00017-9
3. Vyshka G, Kuqo A, Grabova S, Ranxha E, Buda L, Kruja J. Acute flaccid paraplegia: neurological approach, diagnostic workup, and therapeutic options. J Acute Dis. 2015;4(1):1-6. doi: 10.1016/s2221-6189(14)60073-1.
4. Matos Casano HA, Tadi P, Ciofoaia GA. Anterior Cerebral Artery Stroke. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2024 [Updated 2023 Aug 14; cited 2024 Aug 18]. Available from: https://www.ncbi.nlm.nih.gov/books/NBK519039/
5. Decker DA, Perry A, Yachnis AT. Vascular and Ischemic Disorders. In: Perry A, Brat DJ, editors. Practical Surgical Neuropathology: A Diagnostic Approach. 2nd ed. Amsterdam: Elsevier; 2018. p. 633-58. ISBN: 9780323449410.
6. Forsberg J, Blaabjerg M, Diaz A, Gaist TA, Christensen A, Gaist D. Bilateral anterior cerebral artery infarction presenting with acute paraparesis and parkinsonism. Neurol Clin Pract. 2019 Dec;9(6):494-6. doi: 10.1212/CPJ.0000000000000662. PMID: 32042488; PMCID: PMC6927436.
7. Lee JM. Acute paraparesis syndrome after ruptured anterior communicating artery aneurysm. Medicine (Baltimore). 2022 Feb 4;101(5) doi: 10.1097/MD.0000000000028792. PMID: 35119048; PMCID: PMC8812669.
8. Johnston JM, Chicoine MR, Dacey RG Jr, Zipfel GJ. Aneurysmal subarachnoid hemorrhage, hydrocephalus, and acute paraparesis. Neurosurgery. 2008 Dec;63(6):1119-24; discussion 1124. doi: 10.1227/01.NEU.0000334428.21007.2D. PMID: 19057324.
9. Vyshka G, Kuqo A, Grabova S, Ranxha E, Buda L, Kruja J. Acute flaccid paraplegia: neurological approach, diagnostic workup, and therapeutic options. J Acute Dis. 2015;4(1):1-6. doi: 10.1016/s2221-6189(14)60073-1.
10. English SW, Rabinstein AA, Flanagan EP, Zalewski NL. Spinal cord transient ischemic attack: Insights from a series of spontaneous spinal cord infarction. Neurol Clin Pract. 2020 Dec;10(6):480-483. doi: 10.1212/CPJ.0000000000000778. PMID: 33520410; PMCID: PMC7837427.
11. Ho RT, Harrison MJ, Earl CJ. Transient paraparesis: a manifestation of ischaemic episodes in the anterior cerebral artery territory. Postgrad Med J. 1977 Feb;53(617):96-8. doi: 10.1136/pgmj.53.617.96. PMID: 848492; PMCID: PMC2425856.
12. Babu AN, Babu LA, Raden M, Ahuja K. Transient paraparesis due to right carotid stenosis with left anterior cerebral artery aplasia. NeuroImages. Neurology. 2006 Sep 12;67(5):907. doi: 10.1212/01.wnl.0000233867.07604.77. PMID: 16966575.
13. Greene KA, Marciano FF, Dickman CA, Drayer BP, Spetzler RF, Sonntag VK, *et al*. Anterior communicating artery aneurysm paraparesis syndrome: clinical manifestation and pathologic correlates. Neurology. 1995 Jul;45(7):1407-1410. doi: 10.1212/WNL.45.7.1407. PMID: 7617180.
14. Endo H, Shimizu H, Tominaga T. Paraparesis associated with ruptured anterior cerebral artery territory aneurysm. Surg Neurol. 2005 Aug;64(2):135-139. doi: 10.1016/j.surneu.2005.01.028. PMID: 16084534.
15. Vargas-Cañas A. Extensor toe reflex: is still time for a new maneuver description? Arch Neurol Neurol Disord. 2020;3(2):122-124. doi: 10.23880/ANND-16000131.