Journal of Biomedical Practitioners

JBP

Periodico per le professioni biomediche a carattere tecnico - scientifico - professionale

Titolo articolo / Article title:

Abdominal Pain and Vomiting due to Vertebral Artery Dissection: A Case Report of Stroke Chameleon.

Autori / Authors: Sara Giannoni, Mariella Baldini, Maria Letizia Bartolozzi, Elisabetta Bertini, Ilaria Di Donato, Serena Colon, Elisa Grifoni, Elisa Madonia, Ira Signorini, Massimo Armellani, Andrea Pierfederico Sampieri, Luca Masotti, Leonello Guidi.

Pagine / Pages: 64-71, N.1, Vol.9 - 2025

Submitted: 23 October 2024 – *Revised:* 1 November 2024 – ***Accepted***: 11 March 2025 – *Published*: 23 June 2025

Contatto autori / Corresponding author: Sara Giannoni,

sara3.giannoni@uslcentro.toscana.it

Open Access journal – www.ojs.unito.it/index.php/jbp – ISSN 2532-7925

Journal of Biomedical Practitioners ©

JBP

Periodico per le professioni biomediche e sanitarie a carattere tecnico - scientifico – professionale

Journal of Biomedical Practitioners ©
JBP
Periodico per le professioni biomedico-sanitarie a carattere tecnico - scientifico – professionale

SOMMARIO / TABLE OF CONTENTS V. 8, N. 2 – 2024

Journal of Biomedical Practitioners ©
JBP
Periodico per le professioni biomedico-sanitarie a carattere tecnico - scientifico – professionale

SOMMARIO / TABLE OF CONTENTS V. 8, N. 2 – 2024

Journal of Biomedical Practitioners ©
JBP

Periodico per le professioni biomedico-sanitarie a carattere tecnico - scientifico – professionale

SOMMARIO / TABLE OF CONTENTS V. 8, N. 2 – 2024

OPEN ACCESS JOURNAL
http://www.ojs.unito.it/index.php/jbp
ISSN 2532-7925

Journal of Biomedical Practitioners
JBP

A Scientific, Technical and Professional Practice Journal for Biomedical Practitioners

Abdominal Pain and Vomiting due to Vertebral Artery Dissection: A Case Report of Stroke Chameleon.

Sara Giannoni[1], Mariella Baldini[1], Maria Letizia Bartolozzi[1], Elisabetta Bertini[1], Ilaria Di Donato[1], Serena Colon[1], Elisa Grifoni[2], Elisa Madonia[2], Ira Signorini[2], Massimo Armellani[3], Andrea Pierfederico Sampieri[3], Luca Masotti[2], Leonello Guidi[1].

[1] *Neurology Department, San Giuseppe Hospital, Empoli, Italy*

[2] *Stroke Unit- Internal Medicine II, San Giuseppe Hospital, Empoli, Italy*

[3] *Radiology Unit, San Giuseppe Hospital, Empoli, Italy*

Corresponding author: Sara Giannoni - sara3.giannoni@uslcentro.toscana.it
Orcid: https://orcid.org/0000-0003-0538-0412

Come citare / How to Cite:

Giannoni, S., Baldini, M., Bartolozzi, M. L., Bertini, E., Di Donato, I., Colon, S., ... Guidi, L. Abdominal Pain and Vomiting due to Vertebral Artery Dissection: A Case Report of Stroke Chameleon. *Journal of Biomedical Practitioners*, *9*(1).

https://doi.org/10.13135/2532-7925/12015

N. 1, Vol. 9 (2025) – 64:71
Submitted: 23 October 2024
Revised: 1 November 2024
Accepted: 11 March 2025
Published: 23 June 2025

ABSTRACT

INTRODUCTION

The causes of nausea, vomiting, and abdominal pain can be multiple, sometimes including neurological conditions, especially if posterior cranial fossa structures are involved.

CASE DESCRIPTION

A 46-year-old man accesses the Emergency Department for sudden onset of algid sweating, headache, dizziness, vomiting, and severe abdominal pain. The diagnostic workup was negative for gastroenterological issues, and the patient was detained for observation. The following day, the patient developed right-sided Horner's syndrome.

MATERIALS AND METHODS

Echo-color Doppler and neuro-radiological imaging of the cerebro-afferent vessels was performed with finding of right vertebral artery dissection. Brain magnetic resonance imaging (MRI) showed diffusion-restricted lesions in the right cerebellar hemisphere and dorsolateral medulla, indicative of ischemic stroke.

RESULTS

The patient progressively improved, and the neurological examination was normal at discharge. A six-month follow-up MR angiography of intra and extracranial vessels was performed, with persistent right vertebral artery occlusion, in the absence of wall hematoma or pseudoaneurysm.

DISCUSSION

Vertebral artery dissection is estimated to be the cause of approximately 2% of all ischemic strokes, with estimated annual incidence of 2.6-2.9 per 100,000 individuals. The events occur mostly in young individuals who typically present with non-specific symptoms such as dizziness, headache, and cervicalgia; therefore, onset associated with intense abdominal pain is extremely rare.

CONCLUSION

Recognizing that gastrointestinal symptoms may be, rarely, attributable to stroke is useful in avoid ineffective medical management and directing the correct diagnostic and therapeutic process.

Key Words: stroke, vertebral artery dissection, brainstem.

INTRODUCTION

Nausea, incoercible vomiting, and abdominal pain are commonly encountered problems in any general medicine or gastroenterology service. Several causes can be listed, from infections to chronic medical conditions [1]. Rarely, neurological causes can also induce this clinical picture, especially when the brainstem is involved [2], such as in stroke due to anterior spinal artery occlusion or small vascular branches of the vertebral artery [3]. Understanding that gastrointestinal symptoms may be possible neurological manifestations can significantly change the diagnostic and therapeutic approach, especially in emergency cases.

The clinical case presented configures a stroke chameleon, that is, a situation in which an ischemic stroke manifests with atypical symptoms that hinder initial diagnostic framing. In contrast, stroke mimic is a disorder initially framed as an ischemic stroke but actually dependent on other causes, such as epilepsy.

CASE REPORT

A 46-year-old man presented to the Emergency Department with sudden onset of algid sweating and subsequent onset of headache, dizziness, vomiting, and severe abdominal pain. Past medical history was essentially negative. Blood tests showed no significant pathological changes suggestive of inflammation. Abdominal ultrasound (US) showed no abnormalities of the abdominal viscera. The patient also had a non-contrast cranial CT exam, which was negative for acute lesions, and was therefore admitted for management of dehydration, secondary to suspected gastroenteritis. Nausea, vomiting, and headache gradually improved with the use of symptomatic drugs, but the following day the patient presented with right-sided Bernard Horner syndrome.

MATERIALS AND METHODS

Considering that among the main causes of Bernard-Horner syndrome are dissection of the cerebro-afferente vessels, an Echo-color Doppler ultrasound of the supra-aortic trunks was then performed (Figure 1 A, B), with evidence of dissection of the right vertebral artery throughout, also confirmed by the following angio-CT of intra and extracranial vessels (Figure 2).

All images shown were acquired at the hospital San Giuseppe in Empoli, via the ultrasound scanner (Esaote, Linear Probe Frequency Range: 5 - 10 MHz), CT scanner (Siemens Healthcare), and MRI scanner (Philips-1.5T). The protection of patient privacy was considered in accordance with the law EU2016/679, and transposition in Italy D. Lgs.101/2018.

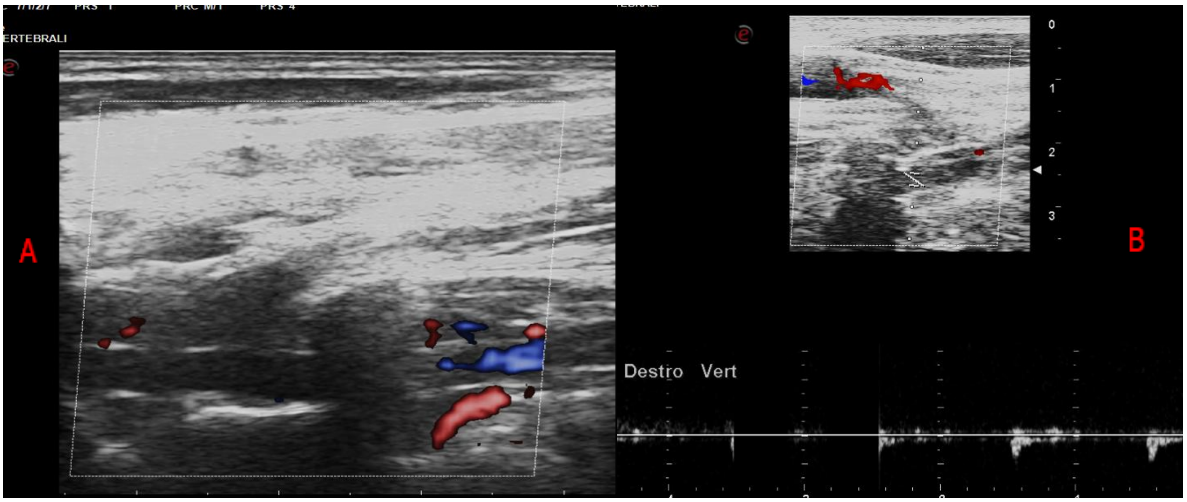

Figure 1: (A) Ultrasound examination of right vertebral artery with evidence of dissection; (B) with systolic spikes

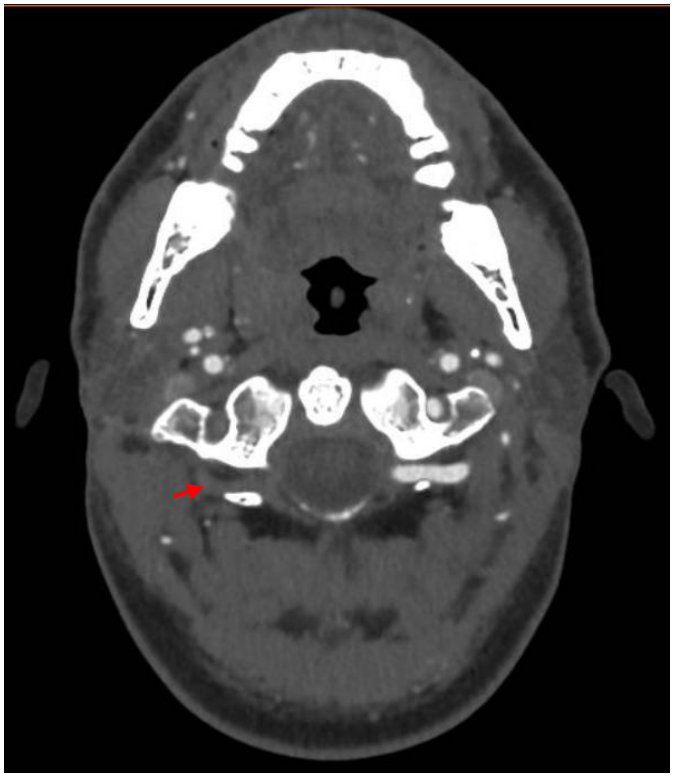

Figure 2: angio-CT of intracranial vessels showing occlusion of the right vertebral artery (red arrow), visualized in the extra to intracranial passage

Brain MRI revealed small, diffusion-restricted findings, indicative for subacute ischemic lesions, in the right cerebellar hemisphere and dorsolateral medulla (Figure 3 A, B), including visceral sensory afferents and the nucleus of the solitary tract, clinically compatible not only with right-sided Horner syndrome, but also with the abdominal pain reported by the patient.

The examination was completed with angiographic study and post processing construction of maximum intensity projection (MIP) and showed occlusion of the right cerebral artery (Figure 3C).

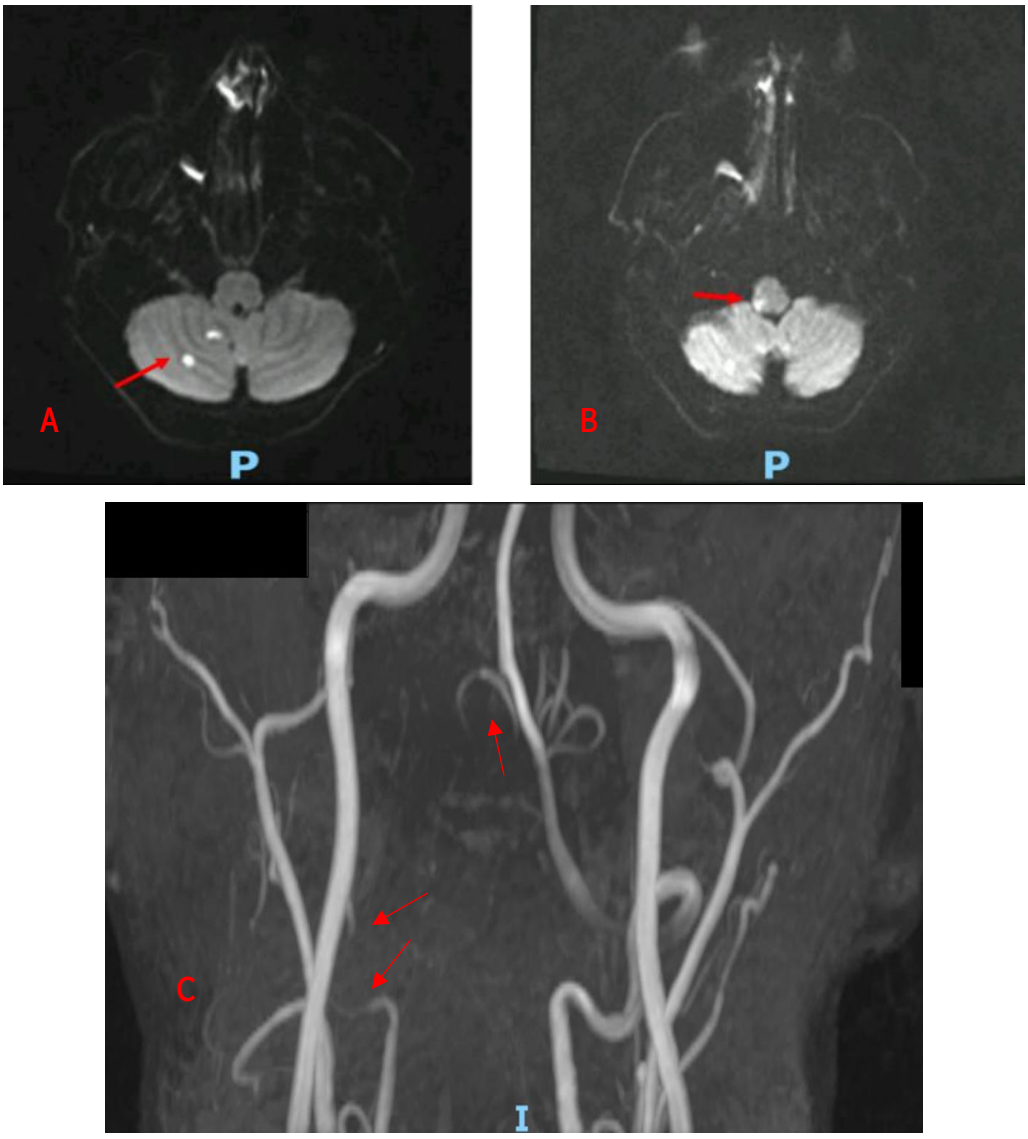

Figure 3: (A, B) encephalon and brainstem MRIs with diffusion weighted imaging (DWI) and FLAIR sequence showing multiple ischemic lesions at the level of the right cerebellar hemisphere and in the dorsolateral region of the bulb (site of visceral afferent sensory fibers and the nucleus of the solitary tract), red arrows; (C) angio-MRI of intracranial vessels with evidence of right vertebral artery occlusion (red arrow)

An angio-CT abdominal vessels was also performed, which excluded dissections in the splanchnic district.

The patient started treatment with acetylsalicylic acid 300 mg/day and anti-thrombotic prophylaxis with subcutaneous low molecular weight heparin, the latter maintained until the patient was properly mobilized.

Upon further investigation of the medical history, a condition of repeated cervical stress emerged, partly due to the work activity of carrying heavy leather on the shoulder and partly to recent olive tree pruning activity, with holding the neck in hyperextension for several hours.

The patient reported no family history of vascular wall diseases and had no dissections in any other vascular district of the body.

However, a comprehensive study of possible hypercoagulability causes including homocysteine, protein C, protein S, antithrombin III, Factor V Leiden, prothrombin, and anti-phospholipid antibodies testing, was performed, from which no pathological findings were found.

We did not consider it necessary to investigate the presence of patency of the foramen ovale.

RESULTS

The patient improved clinically, and the neurological examination was normal at discharge.

A follow up MR angiography with contrast medium of intra and extracranial vessels was performed after six months, and it still showed occlusion of the right vertebral artery throughout its course, without wall hematoma or pseudoaneurysm.

DISCUSSION

This clinical case is the only one so far described in the literature in which a patient with isolated vertebral artery dissection presented with abdominal pain in association with clear neurological complaints. Indeed, a similar case, presented by Sakamoto et al. [3], described a patient with altered consciousness and abdominal pain due to concomitant dissection of right vertebral artery and superior mesenteric artery, which our patient did not have.

Vertebral artery dissection is estimated to cause about 2% of all ischemic strokes, with an estimated annual incidence of 2.6-2.9 per 100,000 individuals [4]. The events occur more commonly in young subjects who typically present with non-specific symptoms, such as dizziness, headache, and cervicalgia.

Although the diagnostic hypothesis of vertebral artery dissection is more likely to be considered in patients with a clear history of cervical trauma/manipulations, or with a known connective

tissue disease, in some cases none of these risk factors is present. Indeed, a recent meta-analysis showed that almost 50% of cases occur in the absence of such risk factors [5].

The most recent clinical trials and meta-analyses regarding medical therapy for cervical arterial dissections do not depict significant differences in terms of risk-benefit and long-term outcomes between single platelet monoantiaggregation vs. warfarin anticoagulation [6,7]. For our patient, we chose to introduce antiplatelet therapy, in view of the extension of the dissection to the intracranial level, a feature that may increase the risk of bleeding.

Regarding neuroradiological follow-up, the range of anatomical resolution of dissections is very wide, from 46% to 90% of cases as far as reported in the scientific literature, with recanalization ranging from 33% to 50% [8].

Regarding long-term treatment with single antiplatelet therapy, no precise guidance on the duration of treatment is currently available. The ESO-Karolinska guidelines recommend continuing therapy for 6-12 months, taking into consideration the possibility of discontinuing treatment in patients who had complete resolution of the dissection and recurrence of symptom [9].

The risk of recurrence of dissection either in the same artery or in another arterial vessel is an infrequent event; a recent meta-analysis has quantified this risk as about 2% at one month after the first event, and about 7% at one year [10].

CONCLUSIONS

Recognizing that nausea, vomiting, and abdominal pain can be attributable to a cerebral stroke, although it is a very rare event, is helpful in avoiding inaccurate and ineffective medical management in order to pursue the right diagnostic and therapeutic process [11].

Careful clinical evaluation and the use of a multidisciplinary diagnostic approach can make a difference in the management of the acute phase of stroke, particularly in cases of atypical presentations.

BIBLIOGRAPHY

[1] J. Tome, A.K. Kamboj, S. Sweetser, "A Practical 5-Step Approach to Nausea and Vomiting" Mayo Clin Proc. 2022 Mar;97(3):600-608. doi: 10.1016/j.mayocp.2021.10.030. PMID: 35246289.

[2] D.T. Cohen, C. Craven, I.Bragin, "Ischemic Stroke Induced Area Postrema Syndrome With Intractable Nausea, Vomiting, and Hiccups" Cureus. 2020 Jun 15;12(6): e8630. doi: 10.7759/cureus.8630. PMID: 32685299; PMCID: PMC7364392.

[3] Y. Sakamoto Y, R. Hiruta, A. Iijima, Y. Sakuma, Y. Konno. Sequential Symptomatic Arterial Dissections in Multiple Vascular Beds in a Patient with Fibromuscular Dysplasia. Intern Med. 2018 Oct 1;57(19):2885-2887. doi: 10.2169/internalmedicine.0704-17. Epub 2018 Apr 27. PMID: 29709948; PMCID: PMC6207829.

[4] C.A Blum, S. Yaghi, "Cervical Artery Dissection: A Review of the Epidemiology, Pathophysiology, Treatment, and Outcome". Arch Neurosci. 2015 Oct;2(4):e26670. doi: 10.5812/archneurosci.26670. Epub 2015 Oct 17. PMID: 26478890; PMCID: PMC4604565.

[5] R.F. Gottesman, P. Sharma, K.A. Robinson et al, "Clinical characteristics of symptomatic vertebral artery dissection: a systematic review". Neurologist. 2012;18:245. doi: 10.1097/NRL.0b013e31826754e1.

[6] Kaufmann JE, Harshfield EL, Gensicke H, et al. Antithrombotic Treatment for Cervical Artery Dissection: A Systematic Review and Individual Patient Data Meta-Analysis. JAMA Neurol. 2024;81(6):630–637. doi:10.1001/jamaneurol.2024.1141

[7] Yaghi S, Shu L, Fletcher L, Fayad FH, Shah A, Herning A, Isho N, Mansour P, Joudi K, Zaidat B, Mahmoud NA, Abdul Khalek F, Xiao H, Goldstein E, Ghannam M, Siegler JE, Salehi Omran S, Bakradze E, Nguyen TN, Keser Z, Khan M, Bavarsad Shahripour R, de Havenon A, Henninger N, Heldner MR, Field TS, Aziz Y, Mistry EA, Furie K, Engelter S, Markus HS. Anticoagulation Versus Antiplatelets in Spontaneous Cervical Artery Dissection: A Systematic Review and Meta-Analysis. Stroke. 2024 Jul;55(7):1776-1786. doi: 10.1161/STROKEAHA.124.047310. Epub 2024 Jun 7. PMID: 38847098.

[8] Janquli M, Selvarajah L, Moloney MA, Kavanagh E, O'Neill DC, Medani M. Long-term outcome of cervical artery dissection. J Vasc Surg. 2023 Jul;78(1):158-165. doi: 10.1016/j.jvs.2023.03.020. Epub 2023 Mar 12. PMID: 36918105.

[9] Ahmed N, Steiner T, Caso V, Wahlgren N; participants E-Ks. Recommendations from the ESO-karolinska stroke update conference, Stockholm 13e15 November 2016. Eur Stroke J 2017;2:95-102.

[10] Lounsbury E, Niznick N, Mallick R, Dewar B, Davis A, Fergusson DA, Dowlatshahi D, Shamy M. Recurrence of cervical artery dissection: A systematic review and meta-analysis. Int J Stroke. 2024 Apr;19(4):388-396. doi: 10.1177/17474930231201434. Epub 2023 Sep 21. PMID: 37661311; PMCID: PMC10964388.

[11] S.P. Jones, J.E Bray, J.M. Gibson, G. McClelland, C. Miller, C.I. Price, C.L. Watkins. "Characteristics of patients who had a stroke not initially identified during emergency prehospital assessment: a systematic review" Emerg Med J. 2021 May;38(5):387-393. doi: 10.1136/emermed-2020-209607. Epub 2021 Feb 19. PMID: 33608393; PMCID: PMC8077214.